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| **Course Code** | **17AG1006** | **Duration :** | **3hrs** |
| **Course Name** | **CROP PHYSIOLOGY** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **CO** | **BL** | **Marks** |
|  | **PART-A(20X1=20 MARKS)** | | | |
| 1. | Site of photorespiration \_\_\_\_\_\_\_\_\_\_. | CO1 | U | 1 |
| 2. | Ascent of sap is known as \_\_\_\_\_\_\_\_\_. | CO2 | R | 1 |
| 3. | The site of light reaction of photosynthesis is \_\_\_\_\_\_\_\_\_\_. | CO4 | R | 1 |
| 4. | Define osmosis with suitable example. | CO2 | R | 1 |
| 5. | The site of Dark reaction of photosynthesis is \_\_\_\_\_\_\_\_\_\_. | CO4 | U | 1 |
| 6. | Latent heat of vaporization of water is \_\_\_\_\_\_\_\_\_\_\_\_. | CO1 | R | 1 |
| 7. | Example for stomatal closing type of antitranspirants \_\_\_\_\_\_\_\_\_\_. | CO3 | A | 1 |
| 8. | Unit of Crop Growth Rate is \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO5 | R | 1 |
| 9. | Explain the role of water in plants. | CO3 | U | 1 |
| 10. | Define transpiration and guttation. | CO2 | U | 1 |
| 11. | NAR x LAI =\_\_\_\_\_\_\_\_. | CO5 | U | 1 |
| 12. | Geeneral starvation is due to the deficiency of \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO3 | An | 1 |
| 13. | Father of Plant Physiology \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | CO1 | R | 1 |
| 14. | Define photolysis of water. | CO4 | R | 1 |
| 15. | Define seed viability. | CO1 | U | 1 |
| 16. | The most abundant protein in the plant world is \_\_\_\_\_\_\_\_\_\_\_\_. | CO4 | R | 1 |
| 17. | Define respiration. | CO4 | U | 1 |
| 18. | Swelling of wooden doors during rainy season is due to\_\_\_\_\_\_\_\_\_\_\_. | CO3 | An | 1 |
| 19. | Which organelle is the control center of the cell? | CO5 | U | 1 |
| 20. | Define endosmosis and exosmosis. | CO2 | U | 1 |

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|  | **PART B(10 X 5= 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Explain the physiological maturity and harvestable maturity. | CO1 | An | 5 |
| 22. | Detail the physiological and biochemical changes during seed  Germination with suitable diagram. | CO5 | An | 5 |
| 23. | Explain the Electron Transport System with Z- Scheme reaction. | CO4 | U | 5 |
| 24. | Explain the physiological functions and deficiencies of micro nutrients of Fe, Mn and Mo. | CO3 | U | 5 |
| 25. | Explain the physiological changes associated with senescence. | CO6 | U | 5 |
| 26. | Enumarate the functions of macronutrients of N,P,K,Ca with suitable example. | CO3 | An | 5 |
| 27. | Explain the physiology of fruit ripening associated with post harvest process. | CO6 | U | 5 |
| 28. | List out the macro and micro nutrients. Write any five physiological disorders in crop plants. | CO3 | A | 5 |
| 29. | Describe the Glycolysis cycle in plants with a diagram. | CO4 | U | 5 |
| 30. | Describe the C4 mechanism with diagram. | CO4 | An | 5 |
| 31. | Explain the ascent of sap mechanisms of xylem transport with diagram. | CO2 | U | 5 |
| 32. | Write in detail about the growth attributes of LAI,SLA,SLW, NAR and HI. | CO5 | An | 5 |

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|  | **PART C(2 X 15= 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Narrate the mechanisms of stomatal opening and closing with suitable diagram and list out the type of transpiration and antitranspirants. | CO2 | An | 8 |
| b. | Apoplast and symplast pathways of water movement with diagram. | CO1 | U | 7 |
| 34. | a. | Elaborate the mechanism of nutrient uptake with diagram and active absorption theories. | CO3 | U | 8 |
| b. | Explain the dark reaction in photosynthesis process. | CO4 | R | 7 |
| 35. | a. | Narrate the role of post harvest technology in agriculture. | CO5 | A | 8 |
| b. | Detail the physiological growth parameters in crop productivity and the difference between climacteric and nonclimacteric fruits. | CO6 | E | 7 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the physiology of plant tissues and cells. |
| CO2 | Remember water movement in plant systems like diffusion and osmosis. |
| CO3 | Apply the concept of water relations, mineral uptake in the field of agriculture. |
| CO4 | Summarize the various physiological processes. |
| CO5 | Measure and analyze the physiological parameters of crops. |
| CO6 | Practice the use of growth regulators correctly to solve physiological problems. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | 9 | - | 5 | - | - | 16 |
| CO2 | 2 | 7 | - | 8 | - | - | 17 |
| CO3 | - | 14 | 6 | 7 | - | - | 27 |
| CO4 | 10 | 12 | - | 5 | - | - | 27 |
| CO5 | 1 | 2 | 8 | 10 | - | - | 21 |
| CO6 | - | 10 | - | - | 7 | - | 17 |
|  | | | | | | | **125** |



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| **Course Code :** | **18AG1001** | **Duration :** | **3hrs** |
| **Course Name:** | **FUNDAMENTALS OF AGRONOMY** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **CO/BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | |
| 1. | Who is known as the father of “Green Revolution”? | CO1/R | 1 |
| 2. | Round revolution deals with \_\_\_\_\_\_\_\_\_\_. | CO3/A | 1 |
| 3. | List out the different branches of agriculture. | CO2/R | 1 |
| 4. | Define fertigation. | CO3/A | 1 |
| 5. | Expand IRRI. | CO1/R | 1 |
| 6. | What is the ideal depth of ploughing required for Cotton? | CO2/An | 1 |
| 7. | The implement used for puddling is\_\_\_\_\_\_\_\_\_\_. | CO2/R | 1 |
| 8. | Define white revolution. | CO2/An | 1 |
| 9. | List out the different types of seeds. | CO2/An | 1 |
| 10. | Name any two secondary tillage implement. | CO3/A | 1 |
| 11. | Name any two cereals. | CO2/R | 1 |
| 12. | Name any two oilseed crop. | CO1/R | 1 |
| 13. | Law of minimum was given by \_\_\_\_\_\_\_\_\_\_. | CO2/R | 1 |
| 14. | What is bio-fertilizer? | CO2/An | 1 |
| 15. | Write the formula for Harvest Index. | CO3/A | 1 |
| 16. | What is edaphic factor? | CO1/R | 1 |
| 17. | Define Growth. | CO2/An | 1 |
| 18. | Define Zero tillage. | CO1/R | 1 |
| 19. | Define an herbicide. | CO3/A | 1 |
| 20. | Define irrigation. | CO2/R | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Difference between bulky organic manure and concentrated oil cake with suitable examples. | CO4/A | 5 |
| 22. | Enlist the characteristics of quality of seeds. | CO2/A | 5 |
| 23. | Enlist different method of sowing and planting with suitable examples. | CO1/A | 5 |
| 24. | What is law of minimum and draw a neat diagram. | CO2/A | 5 |
| 25. | List out the objective difference between intercropping and mixed cropping. | CO1/U | 5 |
| 26. | Explain conservation tillage and minimum tillage. | CO2/An | 5 |
| 27. | List out the objectives of tillage. | CO3/An | 5 |
| 28. | Write different special tillage implement. | CO4/U | 5 |
| 29. | Define crop geometry and write its importance. | CO2/U | 5 |
| 30. | Give the concept of integrated weed management. | CO2/R | 5 |
| 31. | What is allelopathy and list out two crops that have allelopathy effect. | CO1/An | 5 |
| 32. | Write any five climatic factors that influence the crop production explain any two. | CO1/U | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Calculate the quantity of fertilizer requirement through urea, single super phosphate and muriate of potash for 150:50:50 kg NPK / ha. | CO5/R | 8 |
| b. | What is legume effect. | CO5/U | 7 |
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| 34. | a. | Draw a crop plant growth curve and explain it in detail. | CO6/R | 8 |
| b. | Write briefly about biometric and yield attributing character of rice. | CO5/U | 7 |
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| 35. | a. | Differentiate between soil fertility and soil productivity. | CO3/U | 7.5 |
| b. | Give the agronomic classification of field crops with suitable example. | CO3/U | 7.5 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand basics of crop characteristics and its classification. |
| CO2 | Outline the basics of crop characteristics and its classifications. |
| CO3 | Identify crops, seeds, fertilizers, pesticides, farm /tillage implements. |
| CO4 | Acquire scientific knowledge on weeds, its impacts on crop growth and integrated weed management. |
| CO5 | Apply fundamentals of growth concepts, factors influencing and its relationship to nutrients applied. |
| CO6 | Describe crop rotation, its principles and apply knowledge of crop management techniques in crop  Production. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 10 | 5 | 5 | - | - | 25 |
| CO2 | 10 | 5 | 10 | 10 | - | - | 35 |
| CO3 | - | 15 | 5 | 5 | - | - | 25 |
| CO4 | - | 5 | 5 | - |  |  | 10 |
| CO5 | 8 | 7 | - | - | - | - | 15 |
| CO6 | 8 | 7 | - | - | - | - | 15 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG1008/17AG1007** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF GENETICS AND CYTOGENETICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Transversion is substitution of purine by a \_\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 2. | Chromosomal theory of inheritance was proposed by \_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | Example of Chloroplast inheritance is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 4. | In monosomic condition, the chromosome number would be \_\_\_\_\_\_\_\_\_\_\_. | | CO4 | An | 1 |
| 5. | Transfer RNA, MicroRNA, PiRNA and ribosomal RNA are some functional non-coding RNAs which are transcribed from \_\_\_\_\_\_\_\_\_\_\_\_ DNA | | CO2 | A | 1 |
| 6. | If a gene has more than two alleles, it is called \_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 7. | 2n+2 is called as \_\_\_\_\_\_\_\_\_\_\_. | | CO4 | A | 1 |
| 8. | The hereditary particles present in cytoplasm are called \_\_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 9. | The homologous chromosomes are aligned in line during \_\_\_\_\_\_\_\_\_ of mitosis. | | CO3 | U | 1 |
| 10. | All the test crosses are \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | An | 1 |
| 11. | In F2 the diybrid ratio is modified into\_\_\_\_\_\_\_\_\_\_\_\_\_ due to duplicate dominant epistasis. | | CO2 | R | 1 |
| 12. | In M1 generation, \_\_\_\_\_\_\_\_\_\_\_\_\_ mutation is visible and clearly noticed. | | CO4 | A | 1 |
| 13. | Phenylketonuria is an example of \_\_\_\_\_\_\_\_\_\_\_ that increases the levels of a phenylalanine in the blood. | | CO1 | U | 1 |
| 14. | Doubled haploids are \_\_\_\_\_\_\_\_\_\_ of haploids. | | CO5 | An | 1 |
| 15. | Linkage between two genes is measured in terms of \_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 16. | The mitochondria-specific mutagen is \_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 17. | The mechanism of initiation and termination of lac operon is controlled by the enzyme \_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 18. | An example for Y-chromosome linked trait in human male is \_\_\_\_\_\_\_\_\_\_. | | CO2 | A | 1 |
| 19. | To calculate the recombination frequency of **two**linked genes \_\_\_\_\_\_\_\_\_\_cross is used. | | CO2 | U | 1 |
| 20. | Telomerase enzymes are terminal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define law of purity of gametes. | | CO1 | R | 5 |
| 22. | Brief about Y chromosome linked traits with examples. | | CO2 | U | 5 |
| 23. | Who proposed Multiple factor hypothesis and explain with proof. | | CO2 | U | 5 |
| 24. | Explain equational division with neat sketches. | | CO2 | R | 5 |
| 25. | Narrate the pre-mendelian concepts of heredity. | | CO1 | R | 5 |
| 26. | Differentiate Prokaryotic and Eukaryotic cells. | | CO6 | U | 5 |
| 27. | Explain quantitative and Qualitative inheritances. | | CO5 | R | 5 |
| 28. | Recite the enzymes involved in DNA synthesis with functions. | | CO4 | An | 5 |
| 29. | Compare cell division in Prokaryotes and Eukaryotes. | | CO3 | R | 5 |
| 30. | Explain frame shift mutations with diagrams. | | CO4 | U | 5 |
| 31. | Elaborate poly genes and pleiotropic gene. | | CO5 | A | 5 |
| 32. | Brief about the cell division that operates during sporogenesis in plants. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the traits chosen by GJ Mendel for his experiment on *Pisum sativum.* | CO1 | R | 8 |
|  | b. | Explain operon concept with example. | CO5 | U | 7 |
| 34. | a. | Analyze the factors that cause mutations on chromosomes. | CO4 | An | 8 |
|  | b. | Write the types and importance of sudden irreversible changes on hereditary materials. | CO3 | A | 7 |
| 35. | a. | Brief about extranuclear inheritance in plants. | CO6 | R | 8 |
|  | b. | Give a brief on ‘regulation of gene expression’ in primitive cells. | CO3 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Solve problems in Mendelian genetics. |
| CO2 | Construct gene map using linkage. |
| CO3 | Identify the type of aberrations and its usage in agriculture. |
| CO4 | Understand the process of inducing mutation by artificial methods. |
| CO5 | Explain the central dogma of life. |
| CO6 | Discuss Cytoplasmic inheritance in breeding. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 19 | 1 |  | - | - | - | 20 |
| CO2 | 8 | 11 | 2 | 1 | - | - | 22 |
| CO3 | 5 | 9 | 7 | - | - | - | 21 |
| CO4 | 2 | 5 | 2 | 14 | - | - | 23 |
| CO5 | 5 | 8 | 5 | 1 | - | - | 19 |
| CO6 | 10 | 5 | 5 | - | - | - | 20 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG1012** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF AGRICULTURAL ECONOMICS** | **Max. Marks** | **100** |

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| **Q. No.** | | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | | Who wrote the book “An Inquiry into Nature and Causes of Wealth of Nations? | | CO1 | R | 1 |
| 2. | | Name the Greek word from which the word economics was derived from \_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | | Choose true or false. Welfare definition on Economics was given by Alfred Marshall. | | CO1 | A | 1 |
| 4. | | What is called as marginal utility? | | CO2 | R | 1 |
| 5. | | What is called as free good? | | CO2 | R | 1 |
| 6. | | What are the various factors of production? | | CO3 | R | 1 |
| 7. | | What is Engels law? | | CO2 | R | 1 |
| 8. | | Define consumption. | | CO2 | R | 1 |
| 9. | | When price of a commodity increases, its quantity demanded-------- | | CO2 | R | 1 |
| 10. | | What is called as capital? | | CO3 | R | 1 |
| 11. | | Which type of economic system is followed in India? | | CO1 | R | 1 |
| 12. | | What is disposable income? | | CO6 | R | 1 |
| 13. | | What is called as monopoly? | | CO3 | R | 1 |
| 14. | | What is called as GDP? | | CO6 | R | 1 |
| 15. | | Which is the first five year plan period in India? | | CO6 | R | 1 |
| 16. | | Give one example for indirect tax. | | CO5 | R | 1 |
| 17. | | Define balance of payment. | | CO6 | R | 1 |
| 18. | | What is NABARD? | | CO4 | R | 1 |
| 19. | | Which is the central bank of our country? | | CO4 | R | 1 |
| 20. | | What is called as micro finance? | | CO4 | R | 1 |
| PART – B (10 X 5 = 50 MARKS)  (Answer any 10 from the following) | | | | | | |
| 21 | Define indifference curve. Explain the properties of indifference Curves. | | | CO2 | R | 5 |
| 22. | Explain the different types of utility. | | | CO2 | E | 5 |
| 23. | Summarize the features of perfectly competitive and imperfect markets. | | | CO3 | U | 5 |
| 24. | Elaborate Law of supply. | | | CO2 | C | 5 |
| 25. | Explain the different types of inflation. | | | CO6 | E | 5 |
| 26. | Classify the different types of wants and explain in detail. | | | CO2 | An | 5 |
| 27. | Discuss Optimum theory of population. | | | CO3 | C | 5 |
| 28. | List the important features of capitalistic, socialistic and mixed economy. | | | CO1 | An | 5 |
| 29. | Explain division of labour- its merits and demerits. | | | CO3 | U | 5 |
| 30. | Illustrate the circular flow of money in an economy. | | | CO6 | U | 5 |
| 31. | Justify the importance of canons of taxation. | | | CO5 | E | 5 |
| 32 | Outline about capital formation. What are the different ways of capital formation? | | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | a. | | Discuss the traditional and modern approach of Economics. | CO1 | C | 7.5 |
|  | b. | | Explain the Law of diminishing marginal utility with its assumptions, limitations and importance. | CO1 | E | 7.5 |
|  |  | |  |  |  |  |
| 34. | a. | | Elaborate the various concepts of National income accounting. | CO6 | C | 7.5 |
|  | b. | | Explain briefly any two important theories of wage. | CO3 | E | 7.5 |
|  |  | |  |  |  |  |
| 35. | a. | | Summarize law of demand and write in detail about extension and contraction of demand. | CO1 | U | 7.5 |
|  | b. | | Explain the Ricardian theory of rent. | CO3 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the principle and theories, and its role in planning for economic development of the country. |
| CO2 | Remember consumer behaviour - utility maximization problem and demand theory. |
| CO3 | Explain fundamental concepts of agricultural economics, theory of production, theory of cost and output determination across market structures. |
| CO4 | Evaluate different agricultural finance systems and their role as credit agencies. |
| CO5 | Enumerate and discuss different taxes applicable to agriculture. |
| CO6 | Analyze the theory of general equilibrium and welfare economics. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 7.5 | 1 | 5 | 7.5 | 7.5 | 31.5 |
| CO2 | 10 | - | - | 5 | 5 | 5 | 25 |
| CO3 | 3 | 22.5 | - | - | 7.5 | 5 | 38 |
| CO4 | 3 | - | - | - | - | - | 3 |
| CO5 | 1 | - | - | - | 5 | - | 6 |
| CO6 | 4 | 5 |  |  | 5 | 7.5 | 21.5 |
|  | **24** | **35** | **1** | **10** | **30** | **25** | **125** |



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| **Course Code** | **18AG2001** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF PLANT BREEDING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Father of green revolution in India. | | CO2 | R | 1 |
| 2. | Centre of origin for Coffee. | | CO2 | R | 1 |
| 3. | Ploidy level of endosperm ---------. | | CO3 | An | 1 |
| 4. | What is protogyny? Give example. | | CO1 | U | 1 |
| 5. | Dwarfing gene in rice ----------. | | CO2 | R | 1 |
| 6. | What is NDUS for registering a variety. | | CO5 | A | 1 |
| 7. | What is heteromorphic self incompatibility ? | | CO1 | U | 1 |
| 8. | Pure line breeding in crop plants was proposed by. | | CO1 | R | 1 |
| 9. | What is inbreeding depression. | | CO1 | U | 1 |
| 10. | Somatic chromosome number is designated as 2n (True / False). | | CO3 | A | 1 |
| 11. | What is megasporogenesis? | | CO1 | U | 1 |
| 12. | Define male sterility. | | CO1 | U | 1 |
| 13. | What is emasculation? | | CO1 | U | 1 |
| 14. | Cross between an inbred and an open pollinated variety is called------------. | | CO5 | A | 1 |
| 15. | The concept of center of origin was given by----------------. | | CO1 | R | 1 |
| 16. | What is apomixes? | | CO1 | U | 1 |
| 17. | Expand HPR. | | CO1 | U | 1 |
| 18. | Chromosome doubling done using ----------------alkaloid. | | CO3 | R | 1 |
| 19. | What is hybridization in crop plants? | | CO1 | U | 1 |
| 20. | Expand NBPGR. | | CO1 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate between Primary introduction and secondary introduction and give examples. | | CO2 | An | 5 |
| 22. | Explain Participatory plant breeding programme. | | CO6 | A | 5 |
| 23. | Define and explain Hardy- Weinberg law. List the factors affecting it. | | CO1 | U | 5 |
| 24. | Detail the classification of apomixes in crop plants. | | CO1 | U | 5 |
| 25. | Explain the various male sterility systems in crop plants. | | CO1 | An | 5 |
| 26. | Differentiate between quantitative traits and qualitative traits with examples. | | CO1 | An | 5 |
| 27. | Explain Nobilisation of cane with example. | | CO3 | A | 5 |
| 28. | What are the methods to overcome self-incompatibility in plants? | | CO3 | A | 5 |
| 29. | What are the different types of mutation? Give the classification of mutagens with examples. | | CO1 | U | 5 |
| 30. | Define heterosis. What are the different methods of estimation of heterosis? | | CO4 | An | 5 |
| 31. | Briefly explain the wide hybridization in crop plants with examples. | | CO3 | A | 5 |
| 32. | Distinguish between auto and allopolyploids and give examples. | | CO1 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What is self pollination and cross pollination? Give examples. | CO1 | U | 5 |
|  | b. | What are the mechanisms that promote self-pollination and cross pollination in crop plants? | CO3 | A | 10 |
|  |  |  |  |  |  |
| 34. | a. | Describe the process of pureline selection in crop plants. | CO1 | U | 5 |
|  | b. | Explain the pedigree method of plant breeding diagrammatically. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 35. | a. | What are the different stresses in crop plants? Also, list out the major mechanisms in crop plants to mitigate stress. | CO4 | U | 5 |
|  | b. | What are the major goals in Plant Breeding programs? | CO6 | A | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the basic concepts of plant breeding and genetics. |
| CO2 | Remember origin and diversity of different crops, components of inheritance and variations. |
| CO3 | Apply the knowledge to develop high yielding crops with improved quality. |
| CO4 | Produce varieties and hybrids with host plant resistance. |
| CO5 | Apply the protocols of Intellectual Property Rights and Patenting in release of new variety/hybrid. |
| CO6 | Analyze Plant Breeders and Farmer’s Rights for research and commercial seed production of  high yielding crops. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  | 40 | 5 | 5 |  |  | 50 |
| CO2 | 3 |  | 5 |  |  |  | 8 |
| CO3 |  | 1 | 15 | 1 |  |  | 17 |
| CO4 |  | 5 | 5 | 10 |  |  | 20 |
| CO5 | 2 |  | 1 | 7 |  |  | 10 |
| CO6 |  | 5 | 15 |  |  |  | 20 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2002** | **Duration** | **3hrs** |
| **Course Name** | **CROP PRODUCTION TECHNOLOGY-1 (KHARIF CROPS)** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | One bale of jute is -------- kg. | | | CO1 | E | 1 |
| 2. | Golden Fiber Revolution is the revolution in ---------------- crop. | | | CO1 | U | 1 |
| 3. | Nitrogen fixing biofertilizer used for seed treatment in legumes is -------------------------. | | | CO2 | R | 1 |
| 4. | Scientific name of rice is ------------------. | | | CO2 | R | 1 |
| 5. | Scientific name of kodo millet is ------------------. | | | CO2 | U | 1 |
| 6. | The oil percentage of groundnut seeds is -------------- %. | | | CO3 | R | 1 |
| 7. | Hybrid Napiergrass is a cross between Napier grass and-------- crop. | | | CO3 | U | 1 |
| 8. | Indian Institute of Rice Research (IIRR) is located at ----------------. | | | CO3 | R | 1 |
| 9. | Camel crop is ------------------. | | | CO3 | An | 1 |
| 10. | King of oilseeds is ------------------. | | | CO4 | An | 1 |
| 11. | ----------- is origin of rice. | | | CO4 | U | 1 |
| 12. | Major seasons of Tamil Nadu is about -------- numbers. | | | CO4 | E | 1 |
| 13. | Butachlor is a ------- type of herbicide. | | | CO5 | R | 1 |
| 14. | LCC primarily recommended for --------- nutrient management. | | | CO5 | E | 1 |
| 15. | The seed rate of Sesame crop is ---------- kg/ha. | | | CO6 | U | 1 |
| 16. | CEM is located at --------------. | | | CO6 | R | 1 |
| 17. | Seed rate for hybrid rice is ---------- kg/ha. | | | CO6 | U | 1 |
| 18. | The botanical name if pearl millet is ----------------. | | | CO2 | C | 1 |
| 19. | The minor millets or otherwise called as ---------------. | | | CO2 | A | 1 |
| 20. | The *Paspalum scrobiculatum* is the botanical name of ---------- crop. | | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Explain in detail about SRI with its principles. | | | CO3 | An | 5 |
| 22. | Explain the climatic and soil requirements of Sorghum. | | | CO4 | U | 5 |
| 23. | What are the specialties of cumbu Napier grass. | | | CO2 | C | 5 |
| 24. | Write a short note on seed treatment in pulses. | | | CO5 | R | 5 |
| 25. | Write a short note on nutria cereals. | | | CO6 | An | 5 |
| 26. | Differentiate between sorghum poisoning and sorghum injury. | | | CO3 | A | 5 |
| 27. | Explain the climatic and soil requirement of pearl millet. | | | CO1 | E | 5 |
| 28. | Write a short note on Bt cotton. | | | CO2 | U | 5 |
| 29. | Explain about multi bloom technology in green gram. | | | CO6 | A | 5 |
| 30. | Write the scientific name of (1) Sorghum (2) blackgram (3) Sesame (4) Cotton and (5) little millet. | | | CO5 | E | 5 |
| 31. | Explain about Origin, economic importance, soil and climatic requirements, varieties, cultural practices and yield of fodder sorghum. | | | CO3 | C | 5 |
| 32. | Write a short note on nursery preparation and transplanting in paddy. | | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Explain in detail about processing of jute. | CO4 | A | 8 |
|  | | b. | Write in detail about types of millets cultivated in India with their botanic names - Major and minor millets. | CO5 | R | 7 |
| 34. | | a. | Explain the land preparation, seed treatment, sowing, spacing and weed management in cotton. | CO1 | C | 7 |
|  | | b. | Explain the types of groundnut cultivated in India with examples and the climatic requirement of groundnut. | CO6 | An | 8 |
| 35. | | a. | Explain the land preparation, seed treatment, sowing, spacing and weed management in groundnut. | CO3 | E | 7 |
|  | | b. | Explain the land preparation, seed treatment, sowing, spacing and weed management in cowpea. | CO2 | An | 8 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the kharif crops and crop production technology for kharif crops. |
| CO2 | Gain knowledge on geographical distribution of kharif crops uses and products. |
| CO3 | Recall the morphological features and crop production requirements for kharif season crops. |
| CO4 | Remember soil and climatic requirements of different kharif crop varieties. |
| CO5 | Acquire the knowledge on crop management practices for kharif season. |
| CO6 | Apply the acquired knowledge to guide the farmers for cultivating kharif crops. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 0 | 1 | 0 | 0 | 6 | 7 | 14 |
| CO2 | 2 | 11 | 1 | 8 | 0 | 6 | 28 |
| CO3 | 2 | 1 | 5 | 6 | 7 | 5 | 26 |
| CO4 | 0 | 7 | 8 | 1 | 1 | 0 | 17 |
| CO5 | 13 | 0 | 0 | 0 | 6 | 0 | 19 |
| CO6 | 1 | 2 | 5 | 13 | 0 | 0 | 21 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **18AG2003** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL FINANCE AND COOPERATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | Choose the correct answer  Direct finance given by the government at the time of distress is known as (a) Direct credit (b) Indirect credit (c) Taccavi loans (d) Government credit | | | CO3 | A | 1 |
| 2. | List out 5 C’s of credit. | | | CO2 | R | 1 |
| 3. | Choose true or false: All India Rural Credit Survey Committee was constituted under the chairmanship of Sri. B. Venkatappaiah. | | | CO6 | A | 1 |
| 4. | What is FSS? | | | CO2 | R | 1 |
| 5. | Which committee recommended the adoption of area approach to evolve credit plans in rural areas? | | | CO3 | R | 1 |
| 6. | What is called as Micro credit? | | | CO3 | R | 1 |
| 7. | Which is the central bank of our country? | | | CO3 | R | 1 |
| 8. | What is ADB? | | | CO3 | R | 1 |
| 9. | Expand DICGC. | | | CO3 | U | 1 |
| 10. | What is Scale of Finance? | | | CO2 | R | 1 |
| 11. | What is BCR? | | | CO2 | R | 1 |
| 12. | Choose true or false: Crop loans are partially liquidating loan. | | | CO1 | A | 1 |
| 13. | Which conference resulted in the formation of world Bank? | | | CO3 | R | 1 |
| 14. | Who was the chairman of All India Rural Credit Review Committee? | | | CO3 | R | 1 |
| 15. | Which is the hybrid type of credit agency that combine the goodness of commercial bank and cooperatives? | | | CO3 | R | 1 |
| 16. | What are multipurpose cooperatives? | | | CO6 | R | 1 |
| 17. | Which committee recommended the Lead bank scheme? | | | CO3 | R | 1 |
| 18. | Which type of credit is given when land is mortgaged as security? | | | CO2 | R | 1 |
| 19. | What is amortization? | | | CO2 | R | 1 |
| 20. | What is payback period? | | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Explain the need of credit in agriculture. | | | CO1 | E | 5 |
| 22. | What is SWOT analysis and how to conduct it? | | | CO5 | An | 5 |
| 23. | Elaborate the functions of RBI. | | | CO3 | C | 5 |
| 24. | Compare commercial banks and cooperative banks. | | | CO3 | An | 5 |
| 25. | Distinguish development credit and production credit. | | | CO1 | An | 5 |
| 26. | Explain Balance sheet. | | | CO4 | U | 5 |
| 27. | Write in brief about the functions of Lead Bank. | | | CO1 | R | 5 |
| 28. | Compare financing of agriculture and other sectors. | | | CO1 | An | 5 |
| 29. | Identify the reasons behind rural indebtedness in India. | | | CO1 | A | 5 |
| 30. | Explain the importance of world bank. | | | CO3 | E | 5 |
| 31. | Explain the functions of NABARD. | | | CO1 | E | 5 |
| 32. | Explain 3 R’s of credit. | | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Distinguish institutional and non-institutional source of finance with examples. | CO1 | An | 7.5 |
|  | | b. | Organize and explain the 7 P’s of credit. | CO1 | A | 7.5 |
| 34. | | a. | Summarize the history of Cooperative movement in India. | CO3 | U | 7.5 |
|  | | b. | Explain the classification of Agricultural credit. | CO1 | E | 7.5 |
| 35. | | a. | Explain the functions of RRB’s. | CO3 | E | 7.5 |
|  | | b. | Elaborate discounted and undiscounted measures of investment analysis. | CO5 | C | 7.5 |

CO- COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand Financial system in India. |
| CO2 | Apply principles of banking and credit appraisal procedure. |
| CO3 | Analyze credit and deposit services of private, public and cooperative sector banks. |
| CO4 | Prepare and analyze Balance Sheet and Income and Expenditure Statements of a business unit. |
| CO5 | Develop skills in credit analysis, dealing with bankers, loan application procedures. |
| CO6 | Popularize farmer-friendly schemes of Crop insurance and Cooperative warehousing among farmers. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 |  | 13.5 | 17.5 | 17.5 |  | 53.5 |
| CO2 | 6 | 5 |  |  |  |  | 11 |
| CO3 | 9 | 8.5 | 1 | 5 | 12.5 | 5 | 41 |
| CO4 |  | 5 |  |  |  |  | 5 |
| CO5 |  |  |  | 5 |  | 7.5 | 12.5 |
| CO6 | 1 |  | 1 |  |  |  | 2 |
|  | | | | | | | **125** |



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| **Course Code:** | **18AG2005** | **Duration :** | **3hrs** |
| **Course Name:** | **LIVESTOCK AND POULTRY MANAGEMENT** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **CO/BL** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | |
| 1. | The act of parturition in pigs is called as \_\_\_\_\_\_\_\_\_\_. | CO2/R | 1 |
| 2. | The hormone responsible for milk let down is \_\_\_\_\_\_\_\_\_\_. | CO2/U | 1 |
| 3. | India’s position in milk production among world nations is\_\_\_\_\_\_\_\_\_\_. | CO1/R | 1 |
| 4. | The buffalo breed of Tamil Nadu is \_\_\_\_\_\_\_\_\_\_. | CO2/R | 1 |
| 5. | The buffalo breed with tightly curled horns is \_\_\_\_\_\_\_\_\_\_. | CO2/A | 1 |
| 6. | Anthrax is an infectious disease caused by the bacteria \_\_\_\_\_\_\_\_\_\_. | CO6/R | 1 |
| 7. | Black quarter is an infectious bacterial disease caused by \_\_\_\_\_\_\_\_\_\_. | CO6/R | 1 |
| 8. | The stomach of bird is called as \_\_\_\_\_\_\_\_\_\_. | CO4/U | 1 |
| 9. | The normal body temperature of cattle is\_\_\_\_\_\_\_\_\_\_. | CO6/R | 1 |
| 10. | Castrated male cattle is called as \_\_\_\_\_\_\_\_\_\_. | CO2/R | 1 |
| 11. | Young one of a goat is called as \_\_\_\_\_\_\_\_\_\_. | CO2/R | 1 |
| 12. | The dry period recommended for lactating pregnant cows is \_\_\_\_\_\_\_\_\_\_. | CO3/A | 1 |
| 13. | Frequent wagging of tail is a symptom of heat in which animal \_\_\_\_\_\_\_\_\_\_. | CO3/A | 1 |
| 14. | The hormone essential for pregnancy maintenance in cattle is\_\_\_\_\_\_\_\_\_\_. | CO3/A | 1 |
| 15. | Behavioural symptoms of estrus in animals is caused by the hormone \_\_\_\_\_\_\_\_\_\_. | CO3/A | 1 |
| 16. | Goitre is caused by the deficiency of \_\_\_\_\_\_\_\_\_\_. | CO6/E | 1 |
| 17. | The precursor of Vitamin A present in grasses is \_\_\_\_\_\_\_\_\_\_. | CO6 /E | 1 |
| 18. | White muscle disease in young calves is due to the deficiency of \_\_\_\_\_\_\_\_\_\_. | CO6 /A | 1 |
| 19. | Crop is an integral part of the digestive system of \_\_\_\_\_\_\_\_\_\_. | CO4/C | 1 |
| 20. | The hormone responsible broodiness in hen is \_\_\_\_\_\_\_\_\_\_. | CO4/C | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Explain the importance of colostrum feeding. | CO4/E | 5 |
| 22. | Describe the process of ruminant microbial digestion. | CO4 /U | 5 |
| 23. | Explain in detail the feeding and management of piglets. | CO4/A | 5 |
| 24. | Describe the 3 different systems of rearing of cattle. | CO5/E | 5 |
| 25. | List out the different methods of identification used in animals. | CO3/A | 5 |
| 26. | Explain the care and management of pregnant and lactating goats. | CO4/E | 5 |
| 27. | Describe the housing requirements of swine. | CO5/A | 5 |
| 28. | Explain the estrus cycle and heat signs in cow. | CO3/U | 5 |
| 29. | Give a comparison of Indian and exotic breeds of cattle. | CO2 /E | 5 |
| 30. | Differentiate between Morbidity and Mortality. | CO6 /C | 5 |
| 31. | What do you understand by the terms Isolation and Quarantine? | CO6 /C | 5 |
| 32. | Differentiate the different types of Preserved fodder (Silage, Hay and Straw). | CO4/ | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Explain the stages of parturition and signs of calving. | CO3/ A | 7.5 |
| b. | Differentiate between Tail-to-tail system and Head-to-head system. | CO5/A | 7.5 |
|  |  |  |  |  |
| 34. | a. | Explain the structure of a chicken egg and draw and label the parts. | CO3/C | 7.5 |
| b. | Draw the structure of digestive system of chicken and label the parts. | CO4/C | 7.5 |
|  |  |  |  |  |
| 35. | a. | Explain the structure of ruminant stomach with the help of a labeled diagram. | CO4/U | 7.5 |
| b. | Draw a chart showing the vaccination schedule of poultry. | CO3/A | 7.5 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Know the importance of farm animals and its influence in rural economy. |
| CO2 | Distinguish the characteristics of indigenous and exotic breeds of cattle, goat, buffalo, swine and poultry. |
| CO3 | Select quality breeds of livestock and poultry and improve them in a farm. |
| CO4 | Choose nutritious feed rations and feeding of animals and poultry. |
| CO5 | Set up proper housing for farm animals and poultry. |
| CO6 | Manage farm animal diseases, young ones and animal products. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | 1 |  | 5 | 12.5 | 5 | 25.5 |
| CO2 | 1 | 12.5 |  | 5 |  |  | 18.5 |
| CO3 | 3 | 2 | 12.5 |  | 5 | 7.5 | 30 |
| CO4 | 2 | 1 |  | 7.5 | 10 |  | 20.5 |
| CO5 | 7 |  | 5 |  | 12.5 |  | 24.5 |
| CO6 | 1 |  |  |  |  | 5 | 6 |
|  | 16 | 16.5 | 17.5 | 17.5 | 40 | 17.5 | **125** |



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| **Course Code** | **18AG2007** | **Duration** | **3hrs** |
| **Course Name** | **FARMING SYSTEM AND SUSTAINABLE AGRICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Cropping system. | | CO1 | U | 1 |
| 2. | Write a short note on advantages of bulky organic manures. | | CO2 | R | 1 |
| 3. | Define Ratoon cropping. | | CO1 | U | 1 |
| 4. | Define Sericulture. | | CO3 | A | 1 |
| 5. | Define vermicomposting. | | CO2 | R | 1 |
| 6. | Describe Crop geometry. | | CO2 | R | 1 |
| 7. | Write about Collective Farming. | | CO4 | U | 1 |
| 8. | Write the advantages of green manuring. | | CO3 | R | 1 |
| 9. | Different between the Intercropping and Mixed cropping. | | CO3 | A | 1 |
| 10. | Define Cropping pattern. | | CO1 | U | 1 |
| 11. | Define monocropping. | | CO5 | U | 1 |
| 12. | Write the objectives of intercropping. | | CO4 | R | 1 |
| 13. | Define Complementary effect. | | CO6 | U | 1 |
| 14. | Explain Alley cropping. | | CO5 | U | 1 |
| 15. | List out the low cost inputs. | | CO4 | R | 1 |
| 16. | Define farming system. | | CO5 | R | 1 |
| 17. | Explain about Strip cropping. | | CO6 | R | 1 |
| 18. | Write about Agro-ecosystem. | | CO6 | U | 1 |
| 19. | Explain the Alternative farming system. | | CO1 | R | 1 |
| 20. | Define crop intensification. | | CO1 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write a short note on Integrated farming system and its advantage. | | CO5 | A | 5 |
| 22. | Write a short note on choice of crops and varieties in organic farming. | | CO6 | R | 5 |
| 23. | Explain scope of farming system. | | CO4 | R | 5 |
| 24. | Write about the Principal of Sustainable Agriculture. | | CO5 | A | 5 |
| 25. | Discuss about the integrated farming system and its Goals. | | CO3 | U | 5 |
| 26. | Write the Principles of crop rotation. | | CO4 | U | 5 |
| 27. | Differentiate HEIA and LEISA. | | CO3 | A | 5 |
| 28. | Discuss different components of farming system. | | CO2 | A | 5 |
| 29. | Explain the main features of sustainable systems. | | CO4 | An | 5 |
| 30. | Explain the Steps for preparation of a model integrated farming system. | | CO4 | U | 5 |
| 31. | Illustrate the Criteria for enterprise selection for IFS. | | CO3 | A | 5 |
| 32. | List out the IFS for different agro-climatic zones in India. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write about the Objectives and advantages of integrated farming system. | CO2 | R | 7.5 |
|  | b. | Discuss the classification of cropping system. | CO1 | R | 7.5 |
| 34. | a. | Briefly explain the advantages and disadvantages of High external input agriculture (HEIA). | CO3 | An | 7.5 |
|  | b. | Explain the Constraints for adopting conservation agriculture. | CO2 | U | 7.5 |
| 35. | a. | Elaborate the advantages of conservation agriculture. | CO4 | U | 7.5 |
|  | b. | Discuss the Principles of conservation agriculture. | CO5 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Student will able to understand different farming and cropping system. |
| CO2 | Student will able to understand Sustainable agriculture problems and its impact. |
| CO3 | Knowledge about modern agriculture in relation to sustainable agriculture and discuss the  sustainable indicators on ecological basis. |
| CO4 | Understand the sustainable agriculture in relation to tillage, fertilizers, irrigation, weed  management and plant protection measures. |
| CO5 | Analyze the definition, type and method of farming system which help to solve the  problem of soil health degradation and conservation of natural resources including soil  and water as a part of sustainable resource management. |
| CO6 | Understand the important cropping system for sustainable agriculture in India. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 8.5 | 4 | - | - | - | - | 12.5 |
| CO2 | 10.5 | 7.5 | 5 | - | - | - | 23 |
| CO3 | 1 | 10 | 12 | 7.5 | - | - | 30.5 |
| CO4 | 7 | 18.5 | 5 | - | - | - | 30.5 |
| CO5 | 1 | 2 | 17.5 | - | - | - | 20.5 |
| CO6 | 6 | 2 | - | - | - | - | 8 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2008** | **Duration** | **3hrs** |
| **Course Name** | **CROP PRODUCTION TECHNOLOGY II (RABI CROPS)** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The most important pulse crop of India is ---------------------. | | CO1 | U | 1 |
| 2. | The botanical name of Barley is -----------------. | | CO3 | R | 1 |
| 3. | Nipping in chickpea is practiced during ---------------- DAS. | | CO4 | An | 1 |
| 4. | The required seed rate for Lentil is --------------------- kg / ha. | | CO4 | R | 1 |
| 5. | The King of fodder crop is -----------------. | | CO5 | U | 1 |
| 6. | The Crown Root Initiation (CRI) stage of wheat crop is ---------------- DAS. | | CO3 | R | 1 |
| 7. | The herbicied used to control the weed *Polaris minor* in wheat is --------------. | | CO3 | A | 1 |
| 8. | The origin of lemon grass is **---------------------.** | | CO5 | R | 1 |
| 9. | Jave cintronella plantations remain productive for ------------- years. | | CO5 | R | 1 |
| 10. | The inflorescence of sugarcane is called as --------------. | | CO5 | A | 1 |
| 11. | Crop logging technique in sugarcane was developed by ---------------. | | CO5 | R | 1 |
| 12. | Horlicks, Boost, Bournvita are derived from --------------------. | | CO3 | A | 1 |
| 13. | Name a sugarcane ripener -------------------. | | CO5 | R | 1 |
| 14. | How many single budded chips (SSI) are required to plant one ha of sugarcane? | | CO5 | U | 1 |
| 15. | Seedlings of the lemon grass are planted in the field at the age of ------------. | | CO5 | A | 1 |
| 16. | The botanical name of common bread wheat is ------------------. | | CO3 | R | 1 |
| 17. | The normal seed rate of wheat crop is ---------------------- kg / ha. | | CO3 | U | 1 |
| 18. | The fruit of mustard is called as ------------------. | | CO4 | R | 1 |
| 19. | The head or the inflorescence of sunflower is called as ----------------. | | CO4 | R | 1 |
| 20. | The optimum age of seedling for sugarcane transplanting is -------------------. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Distinguish between winter wheat and spring wheat. | | CO2 | An | 5 |
| 22. | Explain the economic importance of barley in India. | | CO1 | An | 5 |
| 23. | List out the major rabi pulse crops with their botanical names. | | CO1 | E | 5 |
| 24. | "Striga" management in sugarcane - Explain. | | CO6 | A | 5 |
| 25. | Write the agro techniques used for seed setting in sunflower. | | CO3 | An | 5 |
| 26. | Write a brief note on mint cultivation in India. | | CO5 | E | 5 |
| 27. | Explain the fodder maize cultivation in India. | | CO6 | A | 5 |
| 28. | How will you prepare the chip bud nursery in sugarcane ? | | CO6 | E | 5 |
| 29. | Explain the important wheat growing zones in India. | | CO1 | An | 5 |
| 30. | Explain the harvesting and threshing operations in barley. | | CO3 | A | 5 |
| 31. | Explain the various methods of planting in sugarcane. | | CO5 | E | 5 |
| 32. | Explain the lemon grass cultivation in India. | | CO5 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the harvesting and processing methods of wheat in India. | CO3 | E | 7 |
|  | b. | What are the different products of wheat and their uses in India. | CO1 | U | 8 |
|  |  |  |  |  |  |
| 34. | a. | Write in detail about the major fodder production systems in India. | CO2 | A | 8 |
|  | b. | Explain in detail about the by-products derived from sugarcane industry. | CO1 | C | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain the nutrient management and weed management in sugarcane. | CO5 | A | 7 |
|  | b. | How will you improve the pulses productivity in India? | CO3 | A | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the economic importance of the Rabi crops. |
| CO2 | Know the agro ecological requirements for Rabi crop production. |
| CO3 | Apply cultural practices and post harvest technology for Wheat and Barley. |
| CO4 | Apply cultural practices and post harvest technology for Pulses and Oilseeds. |
| CO5 | Apply cultural practices and post harvest technology for Sugarcane and Medicinal crops. |
| CO6 | Be aware of the innovations and research advancements in Rabi crop prosuction. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 9 | - | 10 | 5 | 7 | 31 |
| CO2 | - | - | 13 | 5 | - | - | 18 |
| CO3 | 3 | 1 | 15 | 5 | 7 | - | 31 |
| CO4 | 3 | - | - | 1 | - | - | 4 |
| CO5 | 4 | 3 | 12 | - | 7 | - | 26 |
| CO6 | - | - | 10 | - | 5 | - | 15 |
| **Total** | **10** | **13** | **50** | **21** | **24** | **7** | **125** |



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| **Course Code** | **18AG2009** | **Duration** | **3hrs** |
| **Course Name** | **PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS AND LANDSCAPING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define floriculture. | | CO1 | R | 1 |
| 2. | Mention any one loose flower. | | CO1 | R | 1 |
| 3. | Mention one open field cut flower. | | CO1 | R | 1 |
| 4. | Define mobility. | | CO1 | R | 1 |
| 5. | Give one example for informal type of garden. | | CO1 | R | 1 |
| 6. | Who gave the concept of wild garden? | | CO1 | R | 1 |
| 7. | Name any one flowering trees. | | CO1 | R | 1 |
| 8. | Define shrubs. | | CO6 | R | 1 |
| 9. | Give one example for climbers. | | CO4 | R | 1 |
| 10. | Write the botanical name of carnation. | | CO3 | R | 1 |
| 11. | Write the botanical name of gerbera. | | CO1 | R | 1 |
| 12. | Write the botanical name of gladiolus. | | CO1 | R | 1 |
| 13. | What is staking of plants. | | CO1 | R | 1 |
| 14. | Give one example for sympodial orchid. | | CO1 | R | 1 |
| 15. | Mughal gardens follow \_\_\_\_\_\_\_\_\_\_ style design. | | CO3 | R | 1 |
| 16. | *Nelumbo nucifera* is suitable for \_\_\_\_\_\_\_\_\_\_ garden. | | CO2 | R | 1 |
| 17. | Stone lantern is a regular feature of \_\_\_\_\_\_\_\_\_\_ garden. | | CO1 | R | 1 |
| 18. | Define landscaping. | | CO5 | R | 1 |
| 19. | Define lawn. | | CO3 | R | 1 |
| 20. | Define precooling. | | CO2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate monopodial orchids and sympodial orchids. | | CO3 | U | 5 |
| 22. | Discuss mode of propagation and planting of gladiolus. | | CO1 | U | 5 |
| 23. | Write horticultural practices, harvesting and yield of chrysanthemum. | | CO1 | An | 5 |
| 24. | Differentiate African marigold and French marigold. | | CO1 | An | 5 |
| 25. | Give a note on pruning and yield of different species of jasmine. | | CO1 | U | 5 |
| 26. | Write a detailed note on processing and value addition in ornamental crops. | | CO1 | U | 5 |
| 27. | Briefly explain the various maintenance and aftercare operations for lawn grass. | | CO1 | U | 5 |
| 28. | Differentiate between edges and hedges with examples of plants used. | | CO1 | U | 5 |
| 29. | Differentiate between formal and informal style landscape design. | | CO1 | U | 5 |
| 30. | Discuss the designing of institution gardening with examples and illustrations. | | CO1 | U | 5 |
| 31. | Discuss mode of propagation and planting of *Jasminum sambac and J. Grandiflorum.* | | CO5 | C | 5 |
| 32. | Differentiate *Jasminum auriculatum* and *J. multiflorum.* | | CO5 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write the importance and scope of ornamental crops and landscaping. | CO1 | C | 7.5 |
|  | b. | Differentiate Asiatic lily, Oriental lily and Longiflorum lily. | CO3 | U | 7.5 |
| 34. | a. | Write the principles of landscaping. | CO3 | U | 7.5 |
|  | b. | Explain netting technique in carnation. | CO4 | C | 7.5 |
| 35. | a. | Explain the different methods of planting lawn and discuss the advantages and disadvantages of each method. | CO2 | U | 7.5 |
|  | b. | Explain the concept of indoor gardening, plants used and its maintenance. | CO1 | C | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Apply production technology of cut flowers and ornamental crops. |
| CO2 | Establish lawns and manage turf. |
| CO3 | Apply principles of landscaping using trees, shrubs and climbers. |
| CO4 | Design different styles of gardens. |
| CO5 | Handle flower crop harvesting and post-harvest operations. |
| CO6 | Perform training and pruning of ornamental plants. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 12 | 35 | - | 10 | - | 15 | 72 |
| CO2 | 2 | 7.5 | - | - | - | - | 9.5 |
| CO3 | 3 | 20 | - | - | - | - | 23 |
| CO4 | 1 | - | - | - | - | 7.5 | 8.5 |
| CO5 | 1 | 5 | - | - | - | 5 | 11 |
| CO6 | 1 | - | - | - | - | - | 1 |
|  |  |  |  |  |  |  | 125 |



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| **Course Code** | **18AG2010** | **Duration** | **3hrs** |
| **Course Name** | **PRODUCTION TECHNOLOGY FOR FRUIT AND PLANTATION CROPS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention any two important IIHR varieties of Mango crop. | | CO2 | R | 1 |
| 2. | Define Pomology. | | CO2 | R | 1 |
| 3. | Mention the scientific name of Banana. | | CO3 | R | 1 |
| 4. | Papaya belongs to ………….. family. | | CO3 | R | 1 |
| 5. | Transmission of banana bunch top virus is due to ………….. | | CO3 | U | 1 |
| 6. | Mention any two richest source of vitamin ‘C’ fruit. | | CO5 | A | 1 |
| 7. | Mention the salt tolerant rootstocks of mango……….. | | CO5 | A | 1 |
| 8. | Origin of Jackfruit is …………. | | CO2 | R | 1 |
| 9. | National fruit of India is also called as ………….. | | CO3 | R | 1 |
| 10. | Bower system followed in …………. fruit crop. | | CO4 | An | 1 |
| 11. | Allahabad Safeda is a variety of ………… fruit crop. | | CO2 | R | 1 |
| 12. | Expand HDP. | | CO5 | R | 1 |
| 13. | Mention the scientific name of Tea. | | CO3 | R | 1 |
| 14. | Mention any two varieties of Coconut. | | CO3 | R | 1 |
| 15. | Expand the given abbreviated words – TNAU & IIHR. | | CO2 | U | 1 |
| 16. | Commercially followed in Whip and Tongue grafting ……….. fruit crop. | | CO4 | A | 1 |
| 17. | Mangala is a variety of ………… plantation crop. | | CO1 | An | 1 |
| 18. | State tree of Tamil Nadu is called as ……….. plantation crops. | | CO3 | An | 1 |
| 19. | Mention the scientific name of Coconut …………… | | CO3 | An | 1 |
| 20. | Expand the CTC method of tea ………… | | CO3 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write in detail the physiological disorder of Banana. | | CO6 | U | 5 |
| 22. | Explain the six important varieties and Specific features of Papaya. | | CO3 | U | 5 |
| 23. | Elaborate the propagation method of Mango. | | CO2 | U | 5 |
| 24. | Write in important rootstocks of Apple with features. | | CO2 | U | 5 |
| 25. | Describe the tapping method in rubber. | | CO3 | U | 5 |
| 26. | Explain the propagation method of cashew nut. | | CO3 | U | 5 |
| 27. | Explain the important varieties of Coffee. | | CO3 | U | 5 |
| 28. | Write the processing method of tea. | | CO3 | U | 5 |
| 29. | Discuss the importance and scope of fruit and plantation crop industry in India. | | CO3 | An | 5 |
| 30. | Explain the training system of apple. | | CO1 | U | 5 |
| 31. | Discuss the physiological disorders in Grapes. | | CO6 | U | 5 |
| 32. | Explain the important rootstocks of Citrus. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the production technology of Banana. | CO3 | U | 15 |
|  | b. | Explain the production technology of Sapota. | CO3 | U |
|  |  |  |  |  |  |
| 34. | a. | Enumerate the production technology of Pear. | CO3 | U | 15 |
|  | b. | Elaborate the physiological disorders coconut. | CO2 | U |
|  |  |  |  |  |  |
| 35. | a. | Discuss the production technology of Rubber. | CO3 | U | 15 |
|  | b. | Explain the production technology of Cocoa. | CO5 | U |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the scope and importance of fruit and plantation crop production. |
| CO2 | Apply propagation methods in fruit and plantation crops. |
| CO3 | Apply production technologies in fruit and plantation crops. |
| CO4 | Manage pests of fruit and plantation crops. |
| CO5 | Control diseases of fruits and plantation crops. |
| CO6 | Handle physiological disorders of fruit and plantation crops. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 5 | - | 1 | - | - | 6 |
| CO2 | 4 | 18.5 | - | - | - | - | 22.5 |
| CO3 | 5 | 61 | - | 8 | - | - | 74 |
| CO4 | - | - | 1 | 1 | - | - | 2 |
| CO5 | 1 | 7.5 | 2 | - | - | - | 10.5 |
| CO6 | - | 10 | - | - | - | - | 10 |
|  | | | | | | | **125** |



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| **Course code** | **18AG2012** | **Duration :** | **3hrs** |
| **Course Name** | **PROBLEMATIC SOILS AND THEIR MANAGEMENT** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **CO/BL** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | |
| 1. | Define pH of acid soils. | CO1/U | 1 |
| 2. | Define LCC. | CO6/R | 1 |
| 3. | Define Residual Sodium Carbonate. | CO3/U | 1 |
| 4. | Name the reclamation measure for saline soil. | CO4/An | 1 |
| 5. | Which type of erosion is caused by disturbances of people? | CO3/An | 1 |
| 6. | Name the states in our country which are affected by Jhum cultivation. | CO6/An | 1 |
| 7. | Define soil health. | CO1/R | 1 |
| 8. | Define bioremediation. | CO5/R | 1 |
| 9. | Which is the most suitable crop for alkali soil? | CO5/A | 1 |
| 10. | To which order most of the heavy clay soils belong to? | CO1/R | 1 |
| 11. | Name the soil predominated by CaCO3. | CO3/An | 1 |
| 12. | What is the reclamation measure for acid soil? | CO4/An | 1 |
| 13. | Define the pH of saline soil. | CO1/R | 1 |
| 14. | Name the two basic processes involved in remote sensing. | CO4/U | 1 |
| 15. | Find the changes in soil colloids due to excess exchangeable sodium in alkali soils. | CO3/U | 1 |
| 16. | Define calcium carbonate equivalent. | CO4/U | 1 |
| 17. | Mention the reclamation practice for subsoil hardpan. | CO4/A | 1 |
| 18. | Which are the components of soil integrated in its health? | CO1/U | 1 |
| 19. | Define brackish water. | CO2/U | 1 |
| 20. | Indicate the pH of potential acid sulphate soils. | CO3/An | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Enumerate the importance of soil testing and soil health card. | CO1/A | 5 |
| 22. | Write short notes on natural and manmade waste lands. | CO2/An | 5 |
| 23. | Describe in detail the management of salt affected water in irrigation. | CO1/R | 5 |
| 24. | Briefly describe different bioremediation techniques. | CO4/A | 5 |
| 25. | Mention the biological constraints in soil and explain them in detail. | CO3/R | 5 |
| 26. | Explain the role of multipurpose trees in the remediation of problems in soil with suitable examples. | CO4/E | 5 |
| 27. | What are slowly permeable soils? Describe its causes, characters and reclamation measures. | CO3/An | 5 |
| 28. | Explain the on-site and off-site effects of soil compaction. | CO2/E | 5 |
| 29. | List out the characteristics of acid, saline and sodic soils. | CO3/R | 5 |
| 30. | Explain the formation of saline soils and describe its characters and reclamation measures. | CO4/A | 5 |
| 31. | Discuss in detail on land capability classification. | CO6/U | 5 |
| 32. | Write short notes on brackish water. | CO2/U | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Describe elaborately the formation of acid soils, its characteristics and reclamation measures. | CO2/E | 8 |
| b. | Discuss the impacts of soil erosion. | CO4/A | 7 |
|  |  |  |  |  |
| 34. | a. | Discuss in detail any four physical constraints in soil, describe its characteristics and suggest reclamation measures. | CO3/An | 8 |
| b. | Explain the characteristics of submerged soils and analyze the availability of major nutrients in them. | CO3/U | 7 |
|  |  |  |  |  |
| 35. | a. | Discuss the applications of Remote sensing and GIS techniques in the management of natural resources. | CO5/A | 8 |
| b. | Describe the parameters for the determination of irrigation water quality and explain its suitability using the standards. | CO1/U | 7 |

CO – COURSE OUTCOME BL – BLOOMS’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Interpret the soil quality based on their properties and characters. |
| CO2 | Interpret the quality of irrigation water. |
| CO3 | Categorize and characterize the problematic soils. |
| CO4 | Plan appropriate reclamation and management practices for problematic soils. |
| CO5 | Demonstrate the application of Remote sensing, GIS and bioremediation techniques in management of problematic soils. |
| CO6 | Explain the Land use pattern. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 8 | 9 | 5 |  |  |  | 22 |
| CO2 |  | 6 |  | 5 | 13 |  | 24 |
| CO3 | 10 | 9 |  | 16 |  |  | 35 |
| CO4 |  | 2 | 18 | 2 | 5 |  | 27 |
| CO5 | 1 |  | 9 |  |  |  | 10 |
| CO6 | 1 | 5 |  | 1 |  |  | 7 |
|  | 20 | 31 | 32 | 24 | 18 |  | 125 |



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| **Course Code** | **18AG2013** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL MARKETING, TRADE AND PRICES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Market price is determined based on the interaction of ------------ forces. | | CO3 | R | 1 |
| 2. | Expand FCI. | | CO5 | R | 1 |
| 3. | Agricultural products are \_\_\_\_\_\_\_\_\_\_\_\_ in nature. | | CO1 | U | 1 |
| 4. | Which organization announces the Minimum Support Price? | | CO5 | An | 1 |
| 5. | What are the 4p’s of Marketing Mix? | | CO2 | U | 1 |
| 6. | Which type of middlemen buy at low prices when arrivals are more and sell in the off-season when prices are high? | | CO4 | An | 1 |
| 7. | Write down the formula for Price Spread. | | CO3 | A | 1 |
| 8. | Find the risk caused in marketing due to fire, flood, rodents, insects, pests. | | CO4 | R | 1 |
| 9. | Give one example for oligopoly market. | | CO1 | U | 1 |
| 10. | Name of Insurance policy related to Agriculture. | | CO3 | R | 1 |
| 11. | Where is the headquarters of WTO located? | | CO6 | R | 1 |
| 12. | Demand and price of the commodity is -----------related (Directly/Indirectly). | | CO4 | U | 1 |
| 13. | Recall the symbols used in Trade Mark. | | CO6 | R | 1 |
| 14. | How would you classify producer surplus? | | CO2 | R | 1 |
| 15. | For which crop Fair and Remunerative Price (FRP) is being announced. | | CO3 | U | 1 |
| 16. | Choose True or False. COSAMB is the apex body of the state agricultural marketing boards. | | CO5 | R | 1 |
| 17. | Name the market in which goods are exchanged immediately and transaction in future time. | | CO1 | U | 1 |
| 18. | What is GI? | | CO3 | An | 1 |
| 19. | The utility which is created during the process of converting wheat into flour is --------------------. | | CO1 | R | 1 |
| 20. | What is moto of NAFED? | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain in detail about the warehouses in India. | | CO5 | U | 5 |
| 22. | Expand and Explain about PMFBY. | | CO3 | R | 5 |
| 23. | What is your understating about Direct marketing channel? | | CO2 | U | 5 |
| 24. | Describe in detail about market segmentation and marketing mix. | | CO2 | R | 5 |
| 25. | Discuss briefly the 3-Tier structure of Cooperative marketing in India. | | CO5 | U | 5 |
| 26. | Elucidate marketing channels for any agricultural commodities. | | CO4 | An | 5 |
| 27. | What is Contract Farming and explain its advantages and disadvantages? | | CO3 | U | 5 |
| 28. | Explain about the Demand, Law of Demand and types of elasticity. | | CO1 | U | 5 |
| 29. | What do you understand about EXIM policies in India? | | CO6 | R | 5 |
| 30. | Explain about the functions of NAFED. | | CO5 | R | 5 |
| 31. | Explain the concepts- Price spread, marketing efficiency, marketing channel. | | CO1 | An | 5 |
| 32. | Define international trade and explain the significance of GATT. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain in detail about various agricultural price policies in India. | CO5 | R | 7.5 |
|  | b. | List the various dimensions of market classification and explain them in detail. | CO1 | An | 7.5 |
| 34. | a. | Evaluate the functions of different marketing middle man/Intermediaries. | CO4 | U | 7.5 |
|  | b. | Brief about different types of Risk in Marketing agricultural products. | CO3 | U | 7.5 |
| 35. | a. | Explain the various role of Government institutions in supporting Agricultural marketing in India. | CO5 | An | 7.5 |
|  | b. | Define IPR and explain the various types of IPR with example. | CO6 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Know the contours of agricultural market ecosystem, different market structures and their functions. |
| CO2 | Analyze the demand and supply problems in agricultural marketing systems, marketing efficiency and policies. |
| CO3 | Demonstrate the methods of valuation of farm asset. |
| CO4 | Understand the food supply chain and its actors and activities. |
| CO5 | Gain practical skills on dealing with marketing institutions and warehouses. |
| CO6 | Understand international trade arrangements under WTO, Agreement on Agriculture (AOA) and EXIM policies. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 8 | - | 12.5 | - | - | 21.5 |
| CO2 | 6 | 6 | - | - | - | - | 12.0 |
| CO3 | 8 | 13.5 | 1 | 1 | - | - | 23.5 |
| CO4 | 1 | 7.5 | - | 6 | - | - | 14.5 |
| CO5 | 15.5 | 10 | - | 8.5 | - | - | 34.0 |
| CO6 | 12 | 7.5 | - | - | - | - | 19.5 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2019** | **Duration** | **3hrs** |
| **Course Name** | **CROP IMPROVEMENT - I (KHARIF CROPS)** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The concept of ‘Centres of Origin or Diversity’ is proposed by ---------------. | | CO1 | U | 1 |
| 2. | Name the common progenitor of green gram and black gram. | | CO1 | R | 1 |
| 3. | Name the cultivated species of cotton. | | CO1 | R | 1 |
| 4. | The anti-nutritional factor present in fodder sorghum is --------------------. | | CO1 | A | 1 |
| 5. | What is meant by *Insitu* conservation? | | CO1 | U | 1 |
| 6. | The gobal seed vault is located at ------------------------. | | CO1 | A | 1 |
| 7. | NBPGR stands for ---------------------- and is located at ---------------------. | | CO1 | A | 1 |
| 8. | The number of stamens present in rice is -----------------------. | | CO1 | R | 1 |
| 9. | --------------------- is the wild progenitor of maize . | | CO1 | R | 1 |
| 10. | What is the chromosome number of diploid rice? | | CO5 | R | 1 |
| 11. | Differentiate protandry and protogyny. Give examples. | | CO5 | U | 1 |
| 12. | A and R line ratio in hybrid seed production in rice is ---------------------. | | CO5 | A | 1 |
| 13. | The temperature used to store biological material in cryopreservation is -------------. | | CO1 | A | 1 |
| 14. | What is often cross-pollinated crop? Give examples. | | CO4 | U | 1 |
| 15. | Who is the father of hybrid cotton? | | CO5 | R | 1 |
| 16. | Define Ideotype. Who proposed the concept of ideotype? | | CO3 | U | 1 |
| 17. | What is meant by the Xenia effect? | | CO1 | U | 1 |
| 18. | What is gynophore? | | CO4 | R | 1 |
| 19. | Define heritability. Give the formula to calculate heritability. | | CO2 | A | 1 |
| 20. | Red gram belongs to -------------------------- centre of origin. | | CO1 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define Heterosis. Explain the type of heterosis estimation with a formula. | | CO5 | A | 5 |
| 22. | Mention the scientific name, chromosome number, and mode of pollination of the following crops a) Rice b) Red gram c) Sesamum d) Pearl Millet e) Green gram | | CO1 | A | 5 |
| 23. | List out the breeding methods followed in cross-pollinated crops. | | CO3 | R | 5 |
| 24. | Define the following terms a) Emasculation b) Hybridization c) Autogamy d) Allogamy and e) Backcross | | CO2 | R | 5 |
| 25. | Differentiate Qualitative and Quantitative characters. | | CO2 | U | 5 |
| 26. | Explain the evolution of rice with a flow chart. | | CO5 | R | 5 |
| 27. | Explain the breeding objectives in groundnut. | | CO5 | R | 5 |
| 28. | Write about abiotic stress breeding with a proper example. | | CO4 | An | 5 |
| 29. | Explain the floral biology of red gram with a neat diagram. | | CO2 | U | 5 |
| 30. | Write a brief note on types of maize. | | CO5 | A | 5 |
| 31. | Define pure line. Explain the pure-line method. | | CO3 | U | 5 |
| 32. | Write about the yield-contributing traits of pulses. | | CO3 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the different types of germplasm conservation methods. | CO2 | U | 8 |
|  | b. | Define ‘Centres of origin’ and write about their classification. | CO1 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Describe the various emasculation techniques followed in rice. | CO3 | U | 8 |
|  | b. | Explain the back cross method of breeding with a neat flow chart. | CO3 | A | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain the Gene pool concept with its types. | CO1 | A | 8 |
|  | b. | Explain the abiotic stress breeding for crop improvement. | CO4 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Remember the origin and diversity of different crops, components of inheritance, and various crop improvement techniques. |
| CO2 | Understand the genetics of qualitative and quantitative characters. |
| CO3 | Remember different breeding procedures for genetic improvement of *Kharif* crops. |
| CO4 | Evaluate the adaptability, stability, quality parameters, biotic and abiotic stress of various *kharif* crops. |
| CO5 | Utilize hybrid seed production techniques in the cultivation *of Kharif* crops. |
| CO6 | Design and conduct field experiments to analyze the quality characters of donor parents. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 5 | 10 | 17 | - | - | - | 32 |
| CO2 | 5 | 18 | 1 | - | - | - | 24 |
| CO3 | 10 | 14 | 7 | - | - | - | 31 |
| CO4 | 1 | 1 | 7 | 5 | - | - | 14 |
| CO5 | 12 | 1 | 11 | - | - | - | 24 |
| CO6 | - | - | - | - | - | - | - |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **18AG2020** | **Duration** | **3hrs** |
| **Course Name** | **MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | What is the N:P:K content in vermicompost? | | | CO2 | R | 1 |
| 2. | Define IPNS. | | | CO4 | U | 1 |
| 3. | Deficiency symptom of Mo in cauliflower is called as \_\_\_\_\_\_\_\_\_. | | | CO2 | An | 1 |
| 4. | Define Denitrification. | | | CO3 | U | 1 |
| 5. | Which nutrient is responsible for luxury consumption? | | | CO2 | A | 1 |
| 6. | Define straight fertilizer. | | | CO4 | U | 1 |
| 7. | What is N percentage in DAP and CAN? | | | CO2 | R | 1 |
| 8. | List out the immobile elements in soil. | | | CO2 | R | 1 |
| 9. | Siginificance of C:N ratio. | | | CO1 | A | 1 |
| 10. | Reddening in cotton is due to the deficiency of\_\_\_\_\_\_\_\_\_ in plants. | | | CO2 | R | 1 |
| 11. | Give example for amide form of fertilizer. | | | CO1 | R | 1 |
| 12. | List out the secondary nutrients. | | | CO2 | A | 1 |
| 13. | \_\_\_\_\_ is responsible for plant’s root development and a vital component of energy unit. | | | CO3 | U | 1 |
| 14. | \_\_\_\_\_\_\_\_ is a complex water-soluble fertilizer being recommended for drip fertigation. | | | CO2 | R | 1 |
| 15. | Write two examples each for bulky organic manures and concentrated organic manures. | | | CO2 | R | 1 |
| 16. | Tip burning in maize is due to the deficiency of \_\_\_\_\_\_\_\_. | | | CO2 | U | 1 |
| 17. | \_\_\_\_\_\_\_\_\_\_ instrument is used to determine P in soils. | | | CO5 | R | 1 |
| 18. | Gypsum supplies \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ plant nutrients. | | | CO6 | U | 1 |
| 19. | Blossom end rot is caused due to the deficiency of \_\_\_\_\_\_\_\_\_ in tomato. | | | CO2 | R | 1 |
| 20. | Differentiate between green and green leaf manures. | | | CO1 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Enumerate the tertiary nutrient deficiency in plants. | | | CO1 | A | 5 |
| 22. | Explain 4R in nutrient management and its concepts. | | | CO3 | R | 5 |
| 23. | Give a detailed account on phosphorus fertilizers and its classification. | | | CO4 | U | 5 |
| 24. | Distinguish between organic manures and fertilizers with suitable examples. | | | CO1 | R | 5 |
| 25. | Write down the reclamation procedures for different problematic soils. | | | CO6 | An | 5 |
| 26. | Write a note on Nano fertilizers. | | | CO2 | U | 5 |
| 27. | Discuss the mechanisms of nutrients transport to plant system. | | | CO3 | An | 5 |
| 28. | What is soil fertility? Explain the factors affecting soil fertility in a brief manner. | | | CO3 | U | 5 |
| 29. | Write the importance of organic manures on soil fertility improvement. | | | CO1 | An | 5 |
| 30. | Describe the specific fertilizer application methods in a brief manner. | | | CO4 | A | 5 |
| 31. | Write down the physiological role of major nutrient in plant. | | | CO1 | An | 5 |
| 32. | What are known as plant nutrients? Write down three criteria for the essentiality of an element or nutrient. | | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Write an essay on the various methods of soil fertility evaluation. | CO4 | An | 8 |
|  | | b. | Write notes on deficiency and toxicity symptoms of essential plant nutrients and their corrective measures. | CO2 | R | 7 |
| 34. | | a. | Write down the classification, composition and properties of nitrogenous fertilizers. | CO4 | R | 8 |
|  | | b. | Describe the chemistry of N and K in soils. | CO2 | U | 7 |
| 35. | | a. | Write an essay on the various methods of fertilizers application under rainfed and irrigated conditions. | CO2 | An | 8 |
|  | | b. | Explain the classification, composition and properties of organic manures. | CO1 | U | 7 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand the properties of manures, fertilizers and soil amendments. |
| CO2 | Summarize the concepts of soil fertility and plant nutrition and chemistry of nutrients in soil. |
| CO3 | Demonstrate Integrated Nutrient Management and fertilizer recommendation practices. |
| CO4 | Evaluate the fertility of soil. |
| CO5 | Analyze the plant nutrient content. |
| CO6 | Recommend fertilizer dosage for different soil types. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 6 | 7 | 7 | 10 | - | - | 30 |
| CO2 | 19 | 13 | 2 | 9 | - | - | 43 |
| CO3 | 5 | 7 | 0 | 5 | - | - | 17 |
| CO4 | 8 | 7 | 5 | 8 | - | - | 28 |
| CO5 | 1 | 0 | 0 | 0 | - | - | 1 |
| CO6 | 0 | 1 | 0 | 5 | - | - | 6 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **18AG2021** | **Duration** | **3hrs** |
| **Course Name** | **DISEASES OF FIELD & HORTICULTURAL CROPS AND THEIR MANAGEMENT – I** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name the fungi that produces macro conidia, micro conidia and chlamydospore. | | CO4 | R | 1 |
| 2. | Recall the causal organism of root rot of pulse. | | CO2 | U | 1 |
| 3. | --------------- disease of rice is due to Zinc deficiency. | | CO5 | R | 1 |
| 4. | Example of viroid disease infecting coconut is -------------. | | CO3 | U | 1 |
| 5. | Name a seed treating fungicide. | | CO6 | R | 1 |
| 6. | Little leaf of Brinjal is transmitted by --------------. | | CO3 | R | 1 |
| 7. | Pigeon pea sterility mosaic disease is vectored by --------------------------. | | CO3 | R | 1 |
| 8. | Recall the pathogen that produces microsclerotia. | | CO4 | R | 1 |
| 9. | Name the fungicide that controls powdery mildew pathogen----------------. | | CO6 | A | 1 |
| 10. | Bean anthracnose is caused by ---------------------. | | CO2 | R | 1 |
| 11. | Write any one soil borne disease of tomato with causal organism. | | CO1 | R | 1 |
| 12. | Write the characteristic symptom produced by *Alternaria.* | | CO2 | A | 1 |
| 13. | Write the vector that transmits Bunchy top of Banana. | | CO3 | R | 1 |
| 14. | Groundnut rust is caused by ---------------- . | | CO2 | R | 1 |
| 15. | Cite any one obligate parasite that you have studied. | | CO4 | R | 1 |
| 16. | Recommend a fungicide that controls smut fungi. | | CO6 | R | 1 |
| 17. | Name the pathogen that produces fusiform type of conidia. | | CO3 | U | 1 |
| 18. | The pathogen that completes several infection cycles during the cropping season is termed as ---------------. | | CO1 | A | 1 |
| 19. | Example for turnip shaped teliospore producing pathogen is -------------. | | CO2 | U | 1 |
| 20. | Tobacco mosaic virus is -------------------------transmissible. | | CO3 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | List out any five fungal diseases of rice along with their causal organism. | | CO2 | A | 5 |
| 22. | Illustrate with proper diagram the acervuli and pycnidia along with their parts. | | CO4 | U | 5 |
| 23. | Differentiate Downy mildew and Powdery mildew. | | CO2 | R | 5 |
| 24. | Write any five viral diseases with characteristic symptoms and their insect vector. | | CO3 | A | 5 |
| 25. | Explain the following   1. Sexual spore of pearl millet downy mildew 2. Asexual spore of damping off of tomato 3. Sexual fruiting body of powdery mildew 4. Asexual fruiting body of *Colletotrichum* sp. 5. Resting/dormant structure of *Rhizoctonia solani* | | CO4 | E | 5 |
| 26. | Explain early blight disease in tomato with neat diagram. | | CO2 | A | 5 |
| 27. | Elaborate the causal organism, symptoms and management of ergot of cumbu. | | CO6 | A | 5 |
| 28. | Summarize the symptoms and management of bean anthracnose. | | CO6 | E | 5 |
| 29. | Draw the life cycle of damping off disease of vegetable crops. | | CO2 | A | 5 |
| 30. | Explain moko wilt of banana. | | CO3 | An | 5 |
| 31. | Write any five fungicides with their chemical group. | | CO6 | U | 5 |
| 32. | Elaborate coffee rust with neat diagram. | | CO2 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Summarize the symptom and management of bacterial blight of pomegranate and rice with neat diagrams. | CO6 | E | 8 |
|  | b. | Explain the various phanerogamic parasites with suitable examples. | CO1 | A | 7 |
| 34. | a. | List out the important diseases of banana and elaborate the symptom and management of Panama wilt disease. | CO2 | A | 8 |
|  | b. | Explain the symptom and management of blister blight of Tea and white blister of crucifers with their causal organism. | CO6 | R | 7 |
| 35. | a. | List out the diseases of groundnut and differentiate the symptoms and pathogen characters of early and late leaf spots. | CO3 | An | 8 |
|  | b. | Summarize the various smuts of sorghum with their causal organisms and pathogen characters. | CO2 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Recall various plant pathological terms and basic concepts of important plant diseases. |
| CO2 | Explain the disease symptoms of various plant diseases of field and horticultural crops. |
| CO3 | Interpret the host pathogen interaction on disease development in field and horticultural crops. |
| CO4 | Determine the prevalence, epidemiology and factors affecting disease development. |
| CO5 | Apply the concept of integrated management practices to control diseases of field and horticultural crops. |
| CO6 | Recommend management practices for diseases of different crop plants. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | - | 8 | - | - | - | 9 |
| CO2 | 7 | 2 | 31 | 5 | - | - | 45 |
| CO3 | 3 | 3 | 5 | 13 | - | - | 24 |
| CO4 | 3 | 5 | - | - | 5 | - | 13 |
| CO5 | 1 | - | - | - | - | - | 1 |
| CO6 | 9 | 5 | 6 | - | 13 | - | 33 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **18AG2022** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF INTEGRATED PEST AND DISEASE MANAGEMENT** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is plant quarantine? | | CO1 | R | 1 |
| 2. | The use of traps is a ---------------- method of IPM. | | CO1 | R | 1 |
| 3. | Expand: BIPM | | CO3 | U | 1 |
| 4. | Favorable P:D ratio where the pesticide application is negligible ---------. | | CO5 | R | 1 |
| 5. | What is hyper parasitism? | | CO2 | U | 1 |
| 6. | What is seasonal pest? Mention any one example. | | CO1 | R | 1 |
| 7. | Headquarters of DPPQS is located at ----------. | | CO6 | R | 1 |
| 8. | What is Phytosanitary certificate? | | CO5 | U | 1 |
| 9. | The initiation year of IPM on cotton in Tamil Nadu is --------. | | CO4 | R | 1 |
| 10. | The first major IPM project in USA --------. | | CO3 | R | 1 |
| 11. | Nobel prize awardee for the discovery of insecticidal property of DDT --------. | | CO2 | R | 1 |
| 12. | Mention any two quarantine pests which are not reported in India. | | CO2 | R | 1 |
| 13. | Trap crop recommended for *Spodoptera litura* in cotton ---------. | | CO2 | U | 1 |
| 14. | A high-value crop will usually have -----ETL. | | CO1 | U | 1 |
| 15. | A new paradigm of pest management to enhance the natural enemies of pests in an agroecosystem is ----------. | | CO6 | U | 1 |
| 16. | Name the forecasting model for Late blight disease in Potato and rice blast. | | CO4 | U | 1 |
| 17. | How will you prepare Bordeaux mixture 1%? | | CO3 | R | 1 |
| 18. | Name the amphimobile fungicide. | | CO2 | R | 1 |
| 19. | Define antibiotics with an example. | | CO2 | R | 1 |
| 20. | Luthra’s solar heat treatment used for………… disease. | | CO2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe Biological control and Differentiate: Predators and Parasitoids with examples. | | CO2 | An | 5 |
| 22. | Elaborate the biological ecofriendly method for management of Plant diseases using *Pseudomonas sp.* | | CO2 | U | 5 |
| 23. | Define: Pest Monitoring, Pest Surveillance and Pest forecasting. | | CO4 | An | 5 |
| 24. | Elaborate Eco friendly IPM. | | CO5 | U | 5 |
| 25. | Explain Quarantine measures for plant disease control and elaborate different types of Quarantine. | | CO6 | An | 5 |
| 26. | Describe in brief about Principles of IPM. | | CO3 | U | 5 |
| 27. | Explain fungicides based on role in protection and mobility in the plant. | | CO2 | An | 5 |
| 28. | Write in detail on development and validation of IPM. | | CO3 | U | 5 |
| 29. | Explain the steps in the implementation of IPM. | | CO1 | An | 5 |
| 30. | List out the basic requirements for successful implementation of an IPM programme. | | CO3 | U | 5 |
| 31. | Write about the safety issues while handling the pesticides. | | CO5 | An | 5 |
| 32. | Summarize the political, social and legal implications of IPM. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Define: Cultural control and explain the various cultural methods of Insect pest management with examples. | CO2 | An | 8 |
|  | b. | State the scope and limitations of IPM. | CO3 | U | 7 |
| 34. | a. | What is HPR? Explain the three mechanisms of HPR with suitable examples. | CO2 | U | 8 |
|  | b. | Analyze the advantages and limitations of chemical control. | CO2 | An | 7 |
| 35. | a. | Explain the survey and surveillance and forecasting of plant diseases with suitable examples. | CO4 | U | 8 |
|  | b. | Explain the host plant resistance for the management of plant disease with examples. | CO3 | An | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Remember the important concepts and principles of Integrated pest and disease management practices. | | | | | | | |
| CO2 | Understand and demonstrate the various tools of IPM - Cultural, Mechanical, Physical, Biological, Legal and Chemical control. | | | | | | | |
| CO3 | Apply the knowledge to develop Integrated pest and disease management strategies. | | | | | | | |
| CO4 | Analyze the pest outbreak through pest monitoring, forecasting and surveillance methods. | | | | | | | |
| CO5 | Create the awareness among farmers about the importance of IPM and help them to implement the suitable IPM practices based on AESA. | | | | | | | |
| CO6 | Evaluate the political, social, and legal implication of implemented IPM. | | | | | | | |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 3 | 1 | - | 5 | - | - | 9 |
| CO2 | | 5 | 15 | - | 25 | - | - | 45 |
| CO3 | | 2 | 23 | - | 7 | - | - | 32 |
| CO4 | | 1 | 9 | - | 5 | - | - | 15 |
| CO5 | | 1 | 6 | - | 5 | - | - | 12 |
| CO6 | | 1 | 6 | - | 5 | - | - | 12 |
|  | | | | | | | | **125** |



|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **18AG2023** | **Duration** | **3hrs** |
| **Course Name** | **PESTS OF CROPS, STORED GRAINS AND THEIR MANAGEMENT** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Egg parasitoid used for the management of rice stem borer is…………. | | CO3 | U | 1 |
| 2. | Dead heart and shot holes in millets caused by………….. | | CO2 | R | 1 |
| 3. | Name the vector of Rice Tungro Virus in rice…………… | | CO1 | R | 1 |
| 4. | Groundnut field appeared as if grazed by cattle is the symptom of ………… | | CO2 | R | 1 |
| 5. | Scientific name of Rice yellow stem borer ………………. | | CO1 | U | 1 |
| 6. | Rosette flowers that fail to open in cotton are due to infestation by………….. | | CO2 | R | 1 |
| 7. | A pest which attacks pulses in both field and storage is ……………. | | CO4 | U | 1 |
| 8. | Scientific name of tomato fruit borer ………………. | | CO2 | R | 1 |
| 9. | Bhendi vein clearing is transmitted by …………….. | | CO2 | U | 1 |
| 10. | Name the chemical used for attracting the male fruit fly……………… | | CO3 | U | 1 |
| 11. | Sweet potato weevil belongs to the family…………… | | CO5 | U | 1 |
| 12. | A recently introduced invasive pest of papaya is………………. | | CO4 | R | 1 |
| 13. | Give an example for monophagous pest of mango…………….. | | CO2 | R | 1 |
| 14. | Corky or scabby growth on the guava fruits is caused by ……………. | | CO2 | R | 1 |
| 15. | The caterpillar of a pest that resembles bird dropping in young instar is…… | | CO1 | U | 1 |
| 16. | Triangle cut and toppling of central spindle in coconut is a symptom of …… | | CO2 | R | 1 |
| 17. | Scientific name of mango fruit fly……………………….. | | CO2 | U | 1 |
| 18. | Pheromone lure used for the management of red palm weevil is …………… | | CO3 | R | 1 |
| 19. | Name the borer pest that infests cotton and bhendi………………. | | CO2 | U | 1 |
| 20. | Scientific name of pollu beetle ………………… | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Brief about the borer pests of rice with management | | CO3 | An | 5 |
| 22. | Write the integrated pests management for gram pod borer | | CO6 | U | 5 |
| 23. | Explain the different categories of pests | | CO1 | An | 5 |
| 24. | Explain the bionomics, damage symptoms and management for shoot fly | | CO2 | U | 5 |
| 25. | Describe the bionomics, damage symptoms and management for rhinoceros beetle. | | CO2 | An | 5 |
| 26. | Describe the bionomics, damage symptoms of pests of tuber crops | | CO2 | U | 5 |
| 27. | Brief about the pests of guava and their management. | | CO3 | An | 5 |
| 28. | Brief about banana borers with management practices. | | CO3 | U | 5 |
| 29. | Discuss the major pests of cardamom and pepper. | | CO3 | An | 5 |
| 30. | Extend the damage caused by spiraling whitefly and IPM practices for the management. | | CO4 | U | 5 |
| 31. | Discuss the major pests of Apple and their management | | CO2 | An | 5 |
| 32. | Brief the cucurbit fruit fly and their management. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss five major pests of cotton and their management | CO2 | An | 8 |
|  | b. | Brief about the types of damage caused by insect pests | CO1 | U | 7 |
| 34. | a. | Explain the major pests of mango and their management | CO2 | U | 8 |
|  | b. | Write the pod borer complex of pulses in detail. | CO2 | An | 7 |
| 35. | a. | Brief about the borer complex of sugarcane and their management. | CO2 | U | 7 |
|  | b. | Enumerate the primary feeders of stored grains pests and IPM for stored pests | CO5 | An | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Remember morphology and taxonomic characteristics of insect pests affecting crops and stored grains. |
| CO2 | Understand nature and type of damage by different arthropod pests in field, vegetable, fruit and plantation crops, ornamental crops, spices and condiments. |
| CO3 | Analyze factors influencing pest occurrence, distribution and control measures. |
| CO4 | Summarize factors affecting losses of stored grain. |
| CO5 | Analyze the role of various factors in deterioration of grain and their management strategies. |
| CO6 | Recommend pest management measures to resource poor farmers. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 1 | 9 | - | 5 | - | - | 15 |
| CO2 | 7 | 29 | - | 25 | - | - | 61 |
| CO3 | 1 | 12 | - | 15 | - | - | 28 |
| CO4 | 1 | 6 | - | - | - | - | 7 |
| CO5 | - | 1 | - | 8 | - | - | 9 |
| CO6 | - | 5 | - | - | - | - | 5 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2026** | **Duration** | **3hrs** |
| **Course Name** | **INTELLECTUAL PROPERTY RIGHTS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | | **Marks** | |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | | |
| 1. | How many countries signed the GATT agreement? | | CO1 | R | | 1 | |
| 2. | Find True or False: India is a member of WIPO. | | CO1 | R | | 1 | |
| 3. | Expand TRIPS and mention the year of negotiation. | | CO1 | R | | 1 | |
| 4. | What is meant by copyright? | | CO2 | U | | 1 | |
| 5. | Which was an international treaty signed in Hungary? | | CO2 | R | | 1 | |
| 6. | Find out the expansion of ARIPO from the answers given below   1. African Regional Intellectual Property Organization 2. Asian Regional Intellectual Property Organization 3. American Regional Intellectual Property Organization 4. Association of Regional Intellectual Property Organization | | CO2 | R | | 1 | |
| 7. | Mention the name of the protocol that helps to register trademarks worldwide. | | CO3 | R | | 1 | |
| 8. | Mention the national offices that grant patents. | | CO3 | R | | 1 | |
| 9. | Define Industrial Design. | | CO6 | U | | 1 | |
| 10. | Name the act administered for the registration and protection of industrial designs in India. | | CO4 | R | | 1 | |
| 11. | Why does geographic indication need protection? | | CO4 | An | | 1 | |
| 12. | IC is commonly known as.......... | | CO6 | R | | 1 | |
| 13. | What is meant by "Trade Secrets"? | | CO5 | U | | 1 | |
| 14. | What is meant by "post grant opposition of patent" | | CO5 | An | | 1 | |
| 15. | Mention the place where the headquarters of UPOV are situated. | | CO6 | R | | 1 | |
| 16. | In which summit was the Convention on Biological Diversity signed? | | CO6 | R | | 1 | |
| 17. | How defensive protection helps the people have rights over traditional knowledge? | | CO6 | U | | 1 | |
| 18. | Mention the medicinal property of turmeric. | | CO1 | An | | 1 | |
| 19. | Since October 30, 1947, 23 countries have signed the GATT.  True/False | | CO2 | R | | 1 | |
| 20. | When was the first plant breeders' rights program established? | | CO4 | R | | 1 | |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | | |
| 21. | Write about the functions of the WTO and its working structures. | | CO1 | An | | 5 | |
| 22. | Discuss TRIPS in detail. | | CO2 | U | | 5 | |
| 23. | What are the minimum standards required for the protection of IPR? | | CO3 | An | | 5 | |
| 24. | Write a brief note on the Budapest Treaty. | | CO2 | U | | 5 | |
| 25. | Discuss in detail the convention that deals with the protection of literary and artistic works. | | CO2 | An | | 5 | |
| 26. | Write a short note on the Madrid Protocol and its advantages. | | CO2 | U | | 5 | |
| 27. | What are all the types of intellectual property rights, and mention the rules and laws governing them in India? | | CO1 | An | | 5 | |
| 28. | How are patents granted, and what kinds of inventions can be protected? Give examples. | | CO2 | An | | 5 | |
| 29. | What is meant by "trademarks" and what are the procedures to register. | | CO3 | U | | 5 | |
| 30. | Write a short note on the Patent Cooperation Treaty. | | CO4 | U | | 5 | |
| 31. | Elaborate in detail about the protection of plant varieties. | | CO5 | An | | 5 | |
| 32. | Write a brief note on Farmers' Right Act. | | CO6 | U | | 5 | |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | | |
| 33. | a. | What is WIPO’s role in the protection of IP? | CO1 | U | 7.5 | |
|  | b. | Briefly describe trade secrets and mention the kind of information that can be protected by them in detail. | CO1 | U | 7.5 | |
| 34. | a. | Discuss in detail the issues behind patents. | CO2 | An | 7.5 | |
|  | b. | Give a detailed description of the structure of the patent system in India. | CO2 | An | 7.5 | |
| 35. | a. | Write the functions of UPOV and compare the UPOV 1978 and UPOV 1991 Act. | CO4 | An | 7.5 | |
|  | b. | Write the aim and function of the International Treaty on Plant Genetic Resources for Food and Agriculture. | CO4 | An | 7.5 | |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understanding GATT, WTO, TRIPs, and WIPO for IPR protection. |
| CO2 | know how to acquire the patent and copyright for their innovative work. |
| CO3 | Remember plagiarism, which can be questioned legally. |
| CO4 | Explain the UPOV, PPV, and FR Acts of India. |
| CO5 | Apply, analyze, and use ITK strategies. |
| CO6 | To achieve new innovative goals. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 3 | 15 | - | 11 | - | - | 29 |
| CO2 | 3 | 16 | - | 25 | - | - | 44 |
| CO3 | 2 | 5 | - | 5 | - | - | 12 |
| CO4 | 2 | 7 | - | 16 | - | - | 23 |
| CO5 | - | 1 | - | 6 | - | - | 7 |
| CO6 | 3 | 7 | - | - | - | - | 10 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2027** | **Duration** | **3hrs** |
| **Course Name** | **RAINFED AGRICULTURE AND WATERSHED MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | According to planning commission, whole of the country is divided into \_\_\_\_\_\_\_\_\_\_ agro-climatic zones on basis of rainfall, temperature, type of soils and crops. | | CO2 | An | 1 |
| 2. | The value MDI for arid climate type is \_\_\_\_\_\_\_\_\_\_. | | CO2 | A | 1 |
| 3. | Semi-arid have growing period between \_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 4. | If monsoon rains late by 21 days in arid areas, which of the following crops recommended?  a. Pearl-millet b. Moong c. Mothbean d. Sorghum | | CO1 | An | 1 |
| 5. | According to UNESCAP, the criteria for annual rainfall for rainfed farming is | | CO3 | U | 1 |
| 6. | Agroforestry can be a \_\_\_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 7. | Varieties suitable for dryland areas are \_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 8. | Wind breaks and shelterbelts provide more protection   1. Towards windward side b. Towards leeward side c. Both (1) and (2) 2. None of the above | | CO6 | An | 1 |
| 9. | The headquarter of ICARDA is \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 10. | When plant is under moisture stress condition which phenomenon is incorrect in context of water relation?  a.Increase leaf canopy temperature b. Reduced leaf water potential c. Increased turgidity of guard cell d. Reduced relative water content | | CO1 | R | 1 |
| 11. | Which of the following is stomata closing of anti-transpirant?  a.Phenyl Mercuric Acetate (PMA) b. Cycocel (CCC) c. Mobieaf  d. Kaolin | | CO2 | E | 1 |
| 12. | ICAR-CRIDA is located at \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 13. | In rainfed farming, the annual rainfall exceeds   1. 650 mm b. 850 mm c. 950 mm d. 1150 mm | | CO3 | An | 1 |
| 14. | \_\_\_\_\_\_\_\_\_\_ of monsoon rains in India is finished from June to August. | | CO2 | R | 1 |
| 15. | Which herbicide at low concentration acts as a anti-transpirant? | | CO3 | U | 1 |
| 16. | Which one of the following is *in-situ* moisture conservation practice?   1. Construction of water b. Life saving irrigation c. Dead furrow 2. None of these | | CO5 | R | 1 |
| 17. | The condition where the annual precipitation is less than normal over an area for prolonged period   1. Meterologicaldrought b. Atmospheric drought 2. Hydrological drought d. Agricultural drought | | CO4 | A | 1 |
| 18. | The example of reflactant type of antitranspiration is \_\_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 19. | The areas having 5 to 6 weeks of growing period are suitable growing   1. Oilseeds b. Pulses c. Cereals d. Grasses | | CO1 | An | 1 |
| 20. | Loss of water from plant surface is called   1. Evaporation b. Evapotranspiration c. Transpiration d. Guttation | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain different kind of mulches. | | CO4 | R | 5 |
| 22. | Enlist suitable cropping systems for dry land condition. | | CO3 | U | 5 |
| 23. | Define water harvesting. Explain inter row and interplot water harvesting. | | CO5 | An | 5 |
| 24. | Explain techniques for mid-season correction. | | CO2 | U | 5 |
| 25. | Write about different kind of antitranspirants with suitable examples. | | CO6 | R | 5 |
| 26. | Explain different kind of drought. | | CO2 | A | 5 |
| 27. | Explain suitable tillage practices for dryland situations. | | CO1 | R | 5 |
| 28. | Write about Classification of cropping systems. | | CO3 | U | 5 |
| 29. | Enlist *In-Situ* Moisture conservation methods. | | CO5 | R | 5 |
| 30. | Discuss the effects of moisture deficiency in crop plants. | | CO6 | C | 5 |
| 31. | Distinguish between drought avoidance and drought resistance in crop plants. | | CO3 | An | 5 |
| 32. | Describe summer tillage in dryland areas. | | CO3 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write in detail about crop adaptations for drought resistance. | CO3 | U | 7 |
|  | b. | Discuss about factors influencing precipitation and type of rainfall in dry areas. | CO1 | An | 8 |
| 34. | a. | Write about Problems and prospects of rainfed agriculture in India. | CO2 | R | 6.5 |
|  | b. | Explain agroclimatic zones of India. | CO4 | U | 8.5 |
| 35. | a. | Describe integrated watershed management in dryland farming areas. | CO5 | U | 8 |
|  | b. | Describe the management of rainfed crops. | CO1 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand sustainable agriculture practices under rainfed conditions. |
| CO2 | Remember soil and climatic conditions of rainfed areas. |
| CO3 | Explain the various crop management techniques and the adaptation strategies for dry land  Agriculture. |
| CO4 | Formulate contingent water planning for aberrant weather conditions. |
| CO5 | Understand objective, principles and components of watershed management. |
| CO6 | Understand about rainfed agriculture and its introduction, problem and prospects in India. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 14 | - | - | 10 | - | - | 24 |
| CO2 | 8.5 | 5 | 6 | 1 | 1 | - | 21.5 |
| CO3 | 1 | 19 | 5 | 6 | - | - | 31 |
| CO4 | 6 | 9.5 | 1 | - | - | - | 16.5 |
| CO5 | 1 | 14 | - | 5 | - | - | 20 |
| CO6 | 5 | 1 | - | 1 | - | 5 | 12 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2029** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF ORGANIC FARMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define IFS. | | CO1 | U | 1 |
| 2. | Describe Specialized Farming. | | CO1 | R | 1 |
| 3. | Define Organic certification. | | CO5 | U | 1 |
| 4. | Define Sericulture. | | CO3 | U | 1 |
| 5. | Write short notes on  a..NPOP. b. Organic logo. | | CO5 | R | 1 |
| 6. | Describe Compost. | | CO2 | U | 1 |
| 7. | What is the role of organic manures in organic farming? | | CO1 | R | 1 |
| 8. | Write short notes on Organic residues. | | CO4 | U | 1 |
| 9. | What are the essential characteristics of Organic Farming? | | CO1 | A | 1 |
| 10. | Write briefly about Regenerative Agriculture | | CO2 | U | 1 |
| 11. | How does crop residue help in organic farming? | | CO1 | U | 1 |
| 12. | Write about different types of Organic manures. | | CO4 | A | 1 |
| 13. | Write about the concepts of Organic ecosystem. | | CO3 | A | 1 |
| 14. | Write about the use of Bio fertilizers in Organic Farming. | | CO2 | U | 1 |
| 15. | Define Ranching Farming. | | CO1 | R | 1 |
| 16. | Explain usefulness of Diversified crop rotation. | | CO3 | An | 1 |
| 17. | What are the non-chemical weed management methods? | | CO4 | A | 1 |
| 18. | Define Natural farming. | | CO2 | R | 1 |
| 19. | Define intercropping. | | CO3 | An | 1 |
| 20. | Define soil organic carbon. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What are the desirable characters of Green Manuring? | | CO2 | R | 5 |
| 22. | Differentiate between mulching and cover crop. | | CO2 | A | 5 |
| 23. | Define bio fertilizer. Give a detailed account of five bio fertilizers. | | CO4 | An | 5 |
| 24. | Briefly explain about the methods of application and disadvantages of bio fertilizer. | | CO4 | U | 5 |
| 25. | Briefly explain soil fertility management in organic systems. | | CO2 | R | 5 |
| 26. | Explain the differences between the cropping system and farming system. | | CO3 | An | 5 |
| 27. | Write the Advantages and benefits of Organic Farming. | | CO1 | U | 5 |
| 28. | Write about the role of liquid Bio-fertilizers in Soil Health Management. | | CO4 | R | 5 |
| 29. | Why certification is important in organic farming? | | CO6 | A | 5 |
| 30. | Discuss in detail about the specific objectives of farming systems. | | CO3 | U | 5 |
| 31. | Describe about the role of different sources for biological INM. | | CO3 | An | 5 |
| 32. | Briefly explain the indigenous formulations in organic farming. | | CO3 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain organic farming as per definition given by NPOP and then write down the advantages and disadvantages of organic agriculture. | CO6 | U | 7.5 |
|  | b. | Elaborate the integrated control measures for pests in organic farming and differentiate between organic and conventional farming. | CO2 | R | 7.5 |
| 34. | a. | Write the roles of bio compost and oil cakes in organic agriculture. | CO5 | An | 7.5 |
|  | b. | Briefly explain about scope and components of NPOP. | CO1 | U | 7.5 |
| 35. | a. | Write in detail about the choice of crops, varieties and nutrient management in organic crop production. | CO4 | R | 7.5 |
|  | b. | Briefly explain organic certification agencies. | CO5 | An | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the concepts of organic farming. |
| CO2 | Understand the crop management practices and technologies of various crops. |
| CO3 | Recall the different cropping systems of Tamil Nadu. |
| CO4 | Compare the organic crop production with inorganic crop production. |
| CO5 | Apply the knowledge of standards and certification process of organic produce. |
| CO6 | Analyse different marketing strategies of organic farm products. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 14.5 | 1 | - | - | - | 18.5 |
| CO2 | 18.5 | 4 | 5 | - | - | - | 27.5 |
| CO3 | - | 6 | 6 | 12 | - | - | 24 |
| CO4 | 12.5 | 6 | 2 | 5 | - | - | 25.5 |
| CO5 | 1 | 1 | - | 15 | - | - | 17 |
| CO6 | - | 7.5 | 5 | - | - | - | 12.5 |
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| **Course Code :** | **18AG2030** | **Duration :** | **3hrs** |
| **Course Name :** | **DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT-II** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **CO** | **BL** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | | |
| 1. | Wart of potato is caused by -----------------. | CO1 | R | 1 |
| 2. | Purple blotch of onion is incited by -----------. | CO1 | R | 1 |
| 3. | Name the causal organism for Lentil rust. | CO1 | R | 1 |
| 4. | List any two diseases with causal organism in citrus. | CO1 | R | 1 |
| 5. | Indicate the causes for Tundu disease in wheat. | CO2 | U | 1 |
| 6. | Recall the collateral host for red rot of sugarcane. | CO2 | R | 1 |
| 7. | Illustrate the pathogen structure for *Alternaria* *solani* causing early blight in potato. | CO 2 | U | 1 |
| 8. | Distinguish between autoecious and heteroecious rust. | CO5 | An | 1 |
| 9. | Tiger claw effect is a diagnostic symptom of……………….disease. | CO1 | R | 1 |
| 10. | Explain about Giant Mistletoe in Mango. | CO2 | A | 1 |
| 11. | Summarize the symptoms of powdery mildew of grapes. | CO2 | U | 1 |
| 12. | Which pathogen exhibits vein necrosis and black arm symptom in cotton? | CO 2 | An | 1 |
| 13. | Report the typical damage symptom for smut of sugarcane. | CO 2 | A | 1 |
| 14. | Name the biocontrol agent used for seed treatment. | CO1 | R | 1 |
| 15. | Define microcyclic rust. | CO3 | R | 1 |
| 16. | Cite the name of causal organism for sett rot/pineapple disease of sugarcane. | CO1 | R | 1 |
| 17. | Recall the vector transmitting Grapevine fan leaf NEPO Virus ----------------. | CO2 | R | 1 |
| 18. | *Clavibacter xyli* infects sugarcane causing ……….disease. | CO 2 | R | 1 |
| 19. | Explain necrotroph. | CO 5 | An | 1 |
| 20. | Name the selective fungicides for rust and smut diseases of wheat. | CO6 | R | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | |
| 21. | Recommend the integrated management practices for the following diseases   1. Sugarcane red rot 2. Citrus canker 3. Late blight of Potato 4. Cotton Fusarial wilt 5. Grape vine downy mildew | CO 6 | E | 5 |
| 22. | Explain in brief Pokkah boeng of sugarcane. | CO1 | An | 5 |
| 23. | Explain the symptoms, mode of spread and management of citrus tristeza. | CO 3 | U | 5 |
| 24. | Summarize grape vine Anthracnose. | CO1 | U | 5 |
| 25. | Explain head rot of sunflower. | CO2 | A | 5 |
| 26. | Sketch the section of host passing through the sporangial sorus in *Albugo candida.* | CO4 | A | 5 |
| 27. | Answer the following   1. Sexual spore of *Albugo candida* 2. Asexual spore of *Peronospora parasitica* 3. Sexual fruiting body of *Erysiphe* sp. 4. Asexual fruiting body of *Colletotrichum* sp 5. Resting/dormant structure of *Fusarium* sp. | CO5 | An | 5 |
| 28. | Describe purple blotch and smudge of onion | CO2 | U | 5 |
| 29. | Indicate the dispersal pattern of the following   1. Wilt of cotton 2. Powdery mildew of cucurbit 3. Chilli anthracnose 4. Wheat loose smut 5. Grassy shoot of sugarcane | CO3 | A | 5 |
| 30. | Write short notes on the symptoms and management of turmeric leaf spot. | CO3 | E | 5 |
| 31. | Explain the disease cycle of apple scab. | CO4 | U | 5 |
| 32. | What are the major diseases of Bengal gram. Explain any one disease in detail. | CO1 | R | 5 |

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|  | **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Elaborate the symptoms, mode of spread, disease cycle of *Puccinia tritici* causing wheat stem rust and its integrated management practices. | CO4 | C | 8 |
| b. | Elaborate the diagnostic symptoms of two gall forming pathogen infecting crops. | CO2 | E | 7 |
| 34. | a. | Explain sooty mould and red rust diseases of mango. | CO2 | U | 8 |
| b. | Summarize peach leaf curl and chilli leaf curl. | CO2 | U | 7 |
| 35. | a. | Discuss the five important diagnostic symptoms of bacterial blight of cotton with neat diagrams. Explain their mode of spread and integrated management practices. | CO3 | U | 8 |
| b. | Explain the powdery mildew and downy mildew diseases of Peas. | CO2 | U | 7 |

CO-COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Recall various plant diseases and their causal organisms in major field and horticultural crops. | | | | | | | |
| CO2 | Identify the sign and symptoms for detection and diagnosis of various plant diseases of field and horticultural crops. | | | | | | | |
| CO3 | Determine the prevalence, epidemiology and factors affecting disease development. | | | | | | | |
| CO4 | Comprehend the disease cycle of various plant diseases. | | | | | | | |
| CO5 | Analyse the host pathogen interaction on disease development. | | | | | | | |
| CO6 | Apply integrated management practices to control the diseases of field and horticultural crops. | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 12 | 5 | - | 5 | - | - | **22** |
| CO2 | | 3 | 30 | 7 | 1 | 7 | - | **48** |
| CO3 | | 1 | 13 | 5 | - | 5 | - | **24** |
| CO4 | | - | 5 | 5 | - | - | 8 | **18** |
| CO5 | | - | - | - | 7 | - | - | **7** |
| CO6 | | 1 | - | - | - | 5 | - | **6** |
|  | | | | | | | | **125** |



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| **Course Code** | **18AG2031** | **Duration** | **3hrs** |
| **Course Name** | **POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name a class I preservative. | | CO 3 | R | 1 |
| 2. | Who is known as the father of canning? | | CO 3 | R | 1 |
| 3. | How is TSS measured? | | CO 3 | R | 1 |
| 4. | Deficiency of which nutrient will leads to bitter pit in apple. | | CO 4 | An | 1 |
| 5. | Expand ZECC. | | CO 5 | R | 1 |
| 6. | Name the chemical used in lye peeling. | | CO 3 | R | 1 |
| 7. | Give the TSS of fruit jam. | | CO 3 | R | 1 |
| 8. | Give the other name of cold sterilization. | | CO 3 | U | 1 |
| 9. | What does FSSAI stand for? | | CO 6 | R | 1 |
| 10. | Give the other name for appertization. | | CO 3 | U | 1 |
| 11. | What is the maturity index for harvesting papaya? | | CO 2 | R | 1 |
| 12. | Name the enzymes responsible for browning in fruits and vegetables. | | CO 4 | A | 1 |
| 13. | Mention the TSS of marmalade. | | CO 3 | R | 1 |
| 14. | Name the radioisotope used in irradiation of foods. | | CO 3 | R | 1 |
| 15. | Name a pectin rich fruit from which jelly can be prepared. | | CO 3 | R | 1 |
| 16. | Give the name of apple wine. | | CO 3 | R | 1 |
| 17. | What is sheet or flake test? | | CO 3 | R | 1 |
| 18. | Name the major vegetable used in preparation of sauerkraut. | | CO 3 | R | 1 |
| 19. | Name the precursor of ethylene. | | CO 4 | R | 1 |
| 20. | What is weeping of jelly? | | CO 2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate between modified atmospheric packaging and controlled atmospheric packaging. | | CO 5 | A | 5 |
| 22. | Write the method of preparation of jam and jelly. | | CO 3 | U | 5 |
| 23. | What is exhausting? Write the advantages of exhausting. | | CO 3 | R | 5 |
| 24. | Discuss on preservation by freezing. | | CO 6 | E | 5 |
| 25. | Show the flowchart of biosynthesis pathway of ethylene. | | CO 1 | U | 5 |
| 26. | Differentiate between modified atmospheric storage and controlled atmospheric storage. | | CO 5 | A | 5 |
| 27. | Differentiate between pasteurization and sterilization. | | CO 3 | A | 5 |
| 28. | Distinguish between climacteric and non-climacteric fruits. | | CO 2 | An | 5 |
| 29. | List the functions of packaging. | | CO 5 | R | 5 |
| 30. | Mention the importance of shrink packaging. | | CO 5 | An | 5 |
| 31. | Brief the method of preparation of marmalade. | | CO 3 | U | 5 |
| 32. | Give the methods to determine the end point of jam preparation. | | CO 3 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What is canning? Elaborate the process involved in canning technique. | CO 5 | E | 8 |
|  | b. | Write a detailed account of the various types of packaging. | CO 5 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | What is precooling? Explain the various methods of precooling of horticultural produce. | CO 2 | A | 7.5 |
|  | b. | What is chemical preservation? List the major classes of chemicals used with examples. | CO 2 | U | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write in detail about the causes of post-harvest losses. | CO 1 | An | 7.5 |
|  | b. | Describe the technologies for extension of shelf life of fruits and vegetables. | CO 3 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the different post-harvest management of important fruits and vegetables. |
| CO2 | Understand the factors causing post-harvest losses in fruits and Vegetables. |
| CO3 | Explain about the different value addition process of important fruits and vegetables. |
| CO4 | Analyze the market, demand and supply chain for important fruits and vegetables. |
| CO5 | Recommend suitable storage structures and packaging methods for postharvest management of fruits and vegetables. |
| CO6 | Demonstrate knowledge about the different government schemes and laws in import and export of fruits and vegetables. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 5 | - | 7.5 | - | - | 12.5 |
| CO2 | 2 | 7.5 | 7.5 | 5 | - | - | 22 |
| CO3 | 16 | 12 | 12.5 | 5 | - | - | 45.5 |
| CO4 | 1 | - | 1 | 1 | - | - | 3 |
| CO5 | 6 | 7 | 10 | 5 | 8 | - | 36 |
| CO6 | 1 | - | - | - | 5 | - | 6 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2032** | **Duration** | **3hrs** |
| **Course Name** | **CROP IMPROVEMENT-II (RABI CROPS)** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write about Sugarcane True seed. | | CO2 | U | 1 |
| 2. | Write about queen of forage crops. | | CO2 | R | 1 |
| 3. | Write about Noble Cane. | | CO2 | An | 1 |
| 4. | Write about bread wheat. | | CO2 | A | 1 |
| 5. | Write the concept of center of origin. | | CO1 | R | 1 |
| 6. | Expand ICRISAT and CGIAR. | | CO2 | A | 1 |
| 7. | What is the role of NBPGR in crop improvement? | | CO2 | A | 1 |
| 8. | Write the difference between wild relatives and Land races in crop plants. | | CO3 | R | 1 |
| 9. | Define Cryoconservation. | | CO3 | A | 1 |
| 10. | Write the difference between fodder and forage crops. | | CO3 | A | 1 |
| 11. | Write the mode of pollination in Rabi crops and give two examples. | | CO3 | R | 1 |
| 12. | List the types of chickpea. | | CO3 | U | 1 |
| 13. | List the types of sunflower. | | CO3 | U | 1 |
| 14. | What is Self-incompatibility? | | CO4 | U | 1 |
| 15. | Write about breeding objectives of tomato. | | CO4 | R | 1 |
| 16. | What is Plant Genetic Resource? How it is utilized for plant breeding? | | CO4 | A | 1 |
| 17. | Describe the floral biology of safflower. | | CO4 | R | 1 |
| 18. | Write the difference between backcross and testcross. | | CO4 | A | 1 |
| 19. | What is the problem with insect resistance breeding? | | CO5 | AN | 1 |
| 20. | Mention the quality traits with examples. | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define Centres of origin, types and its classification. | | CO1 | R | 5 |
| 22. | List out the breeding objectives in chickpea. | | CO2 | A | 5 |
| 23. | Describe the roles and responsibilities of ICAR –SBI. | | CO2 | A | 5 |
| 24. | Write the procedure of inbred development. | | CO3 | An | 5 |
| 25. | Write notes on Floral biology of sunflower and safflower. | | CO3 | U | 5 |
| 26. | Give a short note on transgenic crops. | | CO4 | A | 5 |
| 27. | Write short note on seed bank. | | CO5 | R | 5 |
| 28. | Describe True Potato Seed (TPS) production technology. | | CO5 | R | 5 |
| 29. | List the fatty acid types present in crops plants. | | CO5 | A | 5 |
| 30. | Write the importance of gene bank for crop improvement. | | CO6 | An | 5 |
| 31. | What are the mandate crops for ICRISAT? | | CO6 | R | 5 |
| 32. | Write short note on speed breeding. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe floral biology of Chickpea. | CO3 | U | 7.5 |
|  | b. | List out the crossing techniques in sugarcane. | CO3 | U | 7.5 |
| 34. | a. | List the breeding objectives of Wheat. | CO4 | U | 7.5 |
|  | b. | Write the merits and demerits of ideotype breeding. | CO4 | R | 7.5 |
| 35. | a. | Differentiate qualitative and quantitative characters in crop breeding. | CO6 | A | 7.5 |
|  | b. | What are the factors for which variety improvement of the crop is done? | CO6 | A | 7.5 |

CO – COURSE OUTCOME BL – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the origin and diversity of different crops, components of inheritance and various crop improvement techniques. |
| CO2 | Understand different breeding techniques for the genetic improvement in Rabicrops. |
| CO3 | Evaluatetheadaptability,stability,qualityparameters,bioticandabioticstressofvariousRabi crops. |
| CO4 | Make use of hybrid seed production techniques in farming of Rabicrops. |
| CO5 | Examine hybrid seed production methods. |
| CO6 | Apply knowledge to develop Climate resilient crop varieties. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1+5 |  |  |  |  |  |  |
| CO2 | 1 | 1 | 3+10 | 1 |  |  |  |
| CO3 | 2 | 2+5+15 | 2 | 5 |  |  |  |
| CO4 | 2+7.5 | 1+7.5 | 2+5 |  |  |  |  |
| CO5 | 1+10 |  | 5 | 1 |  |  |  |
| CO6 | 10 |  | 15 | 5 |  |  |  |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2033** | **Duration** | **3hrs** |
| **Course Name** | **MANAGEMENT OF BENEFICIAL INSECTS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Briefly mention in what way insects are helpful in Agriculture. | | CO1 | U | 1 |
| 2. | Comment on Newton’s Beehive. | | CO6 | R | 1 |
| 3. | When and where the Central Bee Research and Training Institute (CBRTI) was established? | | CO6 | R | 1 |
| 4. | What is queen excluder? Mention a brief note on it. | | CO6 | A | 1 |
| 5. | Give a brief account on Bee pasturage. | | CO6 | An | 1 |
| 6. | Name the bacterium which causes European Fowl Breed disease in honey bee. | | CO6 | R | 1 |
| 7. | Mention the names of any two wax moth which attack the honeybee. | | CO6 | U | 1 |
| 8. | What is Queen substance? What is its use? | | CO6 | U | 1 |
| 9. | Mention the different types of Voltinism in silkworm. | | CO5 | R | 1 |
| 10. | Briefly mention the morphology of fully grown silk worm larvae. | | CO5 | R | 1 |
| 11. | What is the ideal soil to cultivate the mulberry plant? | | CO5 | R | 1 |
| 12. | Briefly comment on Kollar or Strip system of pruning. | | CO5 | An | 1 |
| 13. | Mention a brief note on DFL. | | CO5 | A | 1 |
| 14. | Explain briefly about the different methods of harvesting mulberry leaves. | | CO5 | R | 1 |
| 15. | Give an account on Mountages of silkworm rearing. | | CO5 | R | 1 |
| 16. | Briefly explain how stifling is made in post cocoon processing. | | CO2 | A | 1 |
| 17. | Mention the effective method to protect the harvested cocoon from Dermestid beetle. | | CO2 | A | 1 |
| 18. | Give an account on shellac and its use. | | CO2 | R | 1 |
| 19. | Mention the major lac producing states in India. | | CO4 | R | 1 |
| 20. | Give a brief account on Parasitoids. | | CO3 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Give an account on honeybee caste. Add a note on the duties of worker bee. | | CO6 | R | 5 |
| 22. | Briefly explain how honeybees are maintained in summer season. | | CO6 | R | 5 |
| 23. | Explain briefly how bees communicate among themselves. | | CO6 | U | 5 |
| 24. | Give an account of any one bacterial disease which affect the honeybees and its management. | | CO6 | U | 5 |
| 25. | What is pruning in mulberry plants? What is its use? Mention the different types of pruning adapted in mulberry plants. | | CO5 | U | 5 |
| 26. | Give an account of any one viral disease which affect the silkworm. Add a note on its control measures. | | CO5 | An | 5 |
| 27. | Explain briefly about the rearing of Eri silkworm. | | CO5 | A | 5 |
| 28. | Comment on the composition of lac. Add a note on any two properties of lac. | | CO2 | A | 5 |
| 29. | What is classical Biological control? Explain with example how it is achieved in India? | | CO3 | R | 5 |
| 30. | Point out the qualities of a successful parasitoid used in Biological control. | | CO3 | R | 5 |
| 31. | Give an account on the mass production of *Trichogramma chilonis* Ishii. | | CO4 | U | 5 |
| 32. | Briefly explain with example how the weeds are controlled with insects. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain in detail the caste system in Honeybees. | CO6 | An | 9 |
|  | b. | Briefly explain the protozoan disease which affect the honeybees, add a note on its control measures. | CO2 | R | 6 |
|  |  |  |  |  |  |
| 34. | a. | Give a detailed account on the rearing of mulberry silkworm at home. | CO5 | A | 9 |
|  | b. | Briefly explain about the bacterial disease which affect the silkworms. | CO5 | U | 6 |
|  |  |  |  |  |  |
| 35. | a. | Explain in detail the biology of Lac insects. | CO2 | E | 9 |
|  | b. | What is a parasite? Give an account on the different types of parasitism. | CO3 | A | 6 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Explain the importance of beneficial insects. |
| CO2 | Describe the morphology, biology and behaviour of beneficial insects. |
| CO3 | Identify the common parasitoids and predators used in biological control. |
| CO4 | Mass-multiply the natural enemies. |
| CO5 | Rear silkworms applying innovative techniques |
| CO6 | Practice beekeeping for commercial purpose |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 1 | - | - | - | - | 1 |
| CO2 | 7 | - | 7 | - | 9 | - | 23 |
| CO3 | 10 | - | 6 | 1 | - | -- | 17 |
| CO4 | 11 | - | - | - | - |  | 11 |
| CO5 | 5 | 11 | 15 | 6 | - | - | 37 |
| CO6 | 13 | 12 | 1 | 10 | - | - | 36 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2034** | **Duration** | **3hrs** |
| **Course Name** | **FARM MANAGEMENT, PRODUCTION AND RESOURCE ECONOMICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define farm management. | | CO1 | R | 1 |
| 2. | List out the types of farming. | | CO1 | R | 1 |
| 3. | Write the characteristics of factor-product relationship. | | CO2 | U | 1 |
| 4. | Define production function. | | CO4 | R | 1 |
| 5. | What is breakeven point? | | CO2 | U | 1 |
| 6. | Write about economics of size. | | CO2 | U | 1 |
| 7. | Write the properties of isoquant. | | CO2 | U | 1 |
| 8. | List out the basic product relationships. | | CO2 | R | 1 |
| 9. | What is crop yield index? | | CO5 | U | 1 |
| 10. | List out the types of farm records maintained in a farm. | | CO5 | R | 1 |
| 11. | Difference between farm planning and farm budgeting. | | CO5 | A | 1 |
| 12. | List out the basic assumption of linear programming. | | CO5 | R | 1 |
| 13. | Define risk and uncertainty. | | CO3 | R | 1 |
| 14. | List out salient features of NAIS. | | CO3 | R | 1 |
| 15. | List out the important concepts of natural resources. | | CO6 | R | 1 |
| 16. | Expand PMFBY and list any two of its objectives. | | CO3 | R | 1 |
| 17. | Explain the components of property rights. | | CO6 | U | 1 |
| 18. | Define and draw the iso revenueline. | | CO2 | R | 1 |
| 19. | Define marginal revenue. | | CO2 | R | 1 |
| 20. | List out the income measures in relation to cost concepts. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Difference between production economics and farm management. Also write the scope of farm management. | | CO1 | A | 5 |
| 22. | Explain the principles of farm management. Also explain about short run production function and long run production function. | | CO4 | U | 5 |
| 23. | Explain the concepts involved in production function relationship and relationships between them. | | CO2 | A | 5 |
| 24. | Explain the CACP-Cost concepts. | | CO2 | U | 5 |
| 25. | Explain the methods of least cost combinations. | | CO2 | A | 5 |
| 26. | Explain the categories of farm business measures. | | CO2 | A | 5 |
| 27. | Explain the importance of farm records and also brief about its types. | | CO5 | U | 5 |
| 28. | What is financial ratio analysis and explain its classification. | | CO5 | A | 5 |
| 29. | What is farm budgeting and explain its types. | | CO5 | A | 5 |
| 30. | Explain the sources of risk and uncertainty. | | CO3 | U | 5 |
| 31. | Explain the WBCIS and NCIP. | | CO6 | A | 5 |
| 32. | Explain inefficiency and welfare loss. Also brief its solutions. | | CO6 | E | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the types of farming and its advantages and disadvantages. | CO1 | A | 7.5 |
|  | b. | Explain the system of farming and its characteristics. | CO1 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Explain the methods of decision making and also the steps involved. | CO1 | U | 7.5 |
|  | b. | Explain the impact of technological change on production function. | CO2 | E | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain the internal and external economics in detail. | CO2 | A | 7.5 |
|  | b. | Explain the methods of determining the optimum amount of input and output. | CO5 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Know the concepts and principles of farm management and production economics. |
| CO2 | Optimize use of capital, labour and land by recalling when, where and how to produce. |
| CO3 | Discuss management of resources in crop production process, livestock and allied enterprises |
| CO4 | Apply economic principles in farm management. |
| CO5 | Plan optimal enterprise combinations to meet household goals. |
| CO6 | Analyse farm business, collect, and analyse data on various resources. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 2 | 15 | 12.5 | - | - | - | 29.5 |
| CO2 | 3 | 9 | 22.5 | - | 7.5 | - | 42 |
| CO3 | 3 | 5 | - | - | - | - | 8 |
| CO4 | 1 | 6 | - | - | - | - | 7 |
| CO5 | 2 | 6 | 18.5 | - | - | - | 26.5 |
| CO6 | 1 | 1 | 5 | - | - | - | 12 |
|  | | | | | | | **125** |



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| **Course Code** | **18AG2035** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF FOOD SCIENCE AND NUTRITION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What are the two severe disorders of PEM? | | CO5 | U | 1 |
| 2. | The pH equation is\_\_\_\_\_\_\_\_\_. | | CO2 | An | 1 |
| 3. | Which is the continuous phase in egg? | | CO4 | An | 1 |
| 4. | The example of oligosaccharides\_\_\_\_\_\_. | | CO2 | A | 1 |
| 5. | Soft rot caused by \_\_\_\_\_\_\_\_microorganism. | | CO4 | R | 1 |
| 6. | Name a macronutrient. | | CO 6 | U | 1 |
| 7. | What is the name of the protein that is derived from maize? | | CO3 | An | 1 |
| 8. | \_\_\_\_\_is an emulsifying agent in egg. | | CO1 | A | 1 |
| 9. | Name one Vitamin A deficiency disease. | | CO5 | R | 1 |
| 10. | \_\_\_\_\_\_is commonly used in bread as an antifungal agent. | | CO4 | U | 1 |
| 11. | The pH range of acid foods\_\_\_\_\_. | | CO2 | An | 1 |
| 12. | \_\_\_\_\_\_ is the phase change that happens when solid becomes gas without passing through the liquid phase. | | CO3 | R | 1 |
| 13. | Write the formula for calculating the density. | | CO2 | An | 1 |
| 14. | What is the microorganism present in probiotics? | | CO4 | An | 1 |
| 15. | Give any one example of fermented food. | | CO4 | U | 1 |
| 16. | Iodization of salt is to prevent \_\_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 17. | Name an essential fatty acid. | | CO5 | A | 1 |
| 18. | Proteins are made up of\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 19. | \_\_\_\_\_\_\_\_\_\_Phyto nutrient is present in garlic, onion and cabbage. | | CO3 | An | 1 |
| 20. | Naturally occurring milk sugar is \_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write the functions of colloidal systems and the typescolloidal system in food. | | CO1 | An | 5 |
| 22. | What is biological value of protein? | | CO2 | An | 5 |
| 23. | List three important dietary sources of the following vitamins  a)Vitamin C  b)Vitamin A | | CO5 | R | 5 |
| 24. | What is an essential fatty acid? | | CO 2 | R | 5 |
| 25. | Write down the functions of food. | | CO1 | A | 5 |
| 26. | Explain any two mineral deficiency disorders. | | CO5 | R | 5 |
| 27. | What does a balanced diet mean? and why is it important to eat a balanced diet. | | CO6 | U | 5 |
| 28. | Write short notes on radiation. | | CO1 | U | 5 |
| 29. | List the various flavouring substances used in foods. | | CO3 | R | 5 |
| 30. | What are the principles of food preservation? | | CO4 | U | 5 |
| 31. | Write a short note on moisture contents in foods. | | CO2 | U | 5 |
| 32. | Bring out the reasons for fortification of food. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Give a brief note on krebs cycle. | CO2 | An | 8 |
|  | b. | Describe the properties of carbohydrate. | CO1 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Explain about the causes of food spoilage. | CO4 | R | 7 |
|  | b. | Write a brief note on different methods of drying. | CO3 | U | 8 |
|  |  |  |  |  |  |
| 35. | a. | Explain about the malnutrition. | CO 6 | A | 7 |
|  | b. | Describe about the preservation by low temperature. | CO4 | R | 8 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concepts of food science. |
| CO2 | Enumerate and describe food composition and food chemistry. |
| CO3 | Demonstrate the principles and methods of food processing. |
| CO4 | Analyze the methods to control microbes and preserve the food. |
| CO5 | Identify the nutritional disorders. |
| CO6 | Design balanced / modified diet to meet consumer needs. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 1 | 12 | 6 | 5 | - | - | 24 |
| CO2 | 5 | 6 | 1 | 16 | - | - | 28 |
| CO3 | 6 | 8 | - | 2 | - | - | 16 |
| CO4 | 16 | 7 | - | 2 |  |  | 25 |
| CO5 | 11 | 1 | 1 | - | - | - | 13 |
| CO6 | 6 | 6 | 7 | - | - | - | 19 |
|  | | | | | | | **125** |



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| **Course Code** | **18AT2020** | **Duration** | **3hrs** |
| **Course Name** | **PROCESS ENGINEERING FOR SPICES AND PLANTATION CROPS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Which state in India is the major producer of pepper? | | CO1 | R | 1 |
| 2. | List the different stages of harvest for areanut. | | CO3 | U | 1 |
| 3. | What is meant by Gourmet Vanilla? | | CO5 | U | 1 |
| 4. | ………….is the largest producer, consumer and exporter of spices. | | CO1 | R | 1 |
| 5. | …………….pigment is responsible for pungency in chilli. | | CO5 | R | 1 |
| 6. | Which is called as king of spices? | | CO1 | R | 1 |
| 7. | Natural rubber tapped from the rubber tree is known as………….. | | CO3 | U | 1 |
| 8. | The processing step after the heat killing treatment in vanilla is ……….. | | CO3 | U | 1 |
| 9. | Removal of caffeine from coffee beans is called …………. | | CO3 | U | 1 |
| 10. | What is Vulcanization in rubber processing?? | | CO3 | R | 1 |
| 11. | Coagulation of latex is done by adding………..acid. | | CO1 | R | 1 |
| 12. | Name the world’s largest producer of chilli. | | CO1 | R | 1 |
| 13. | List the byproducts obtained from nutmeg. | | CO2 | U | 1 |
| 14. | Name the polyphenol present in tea. | | CO5 | U | 1 |
| 15. | The volatile oil obtained from the clove bud contains mainly ………………..(80-90%) | | CO3 | R | 1 |
| 16. | Name the twin spice. | | CO2 | R | 1 |
| 17. | What is AGMARK? | | CO5 | U | 1 |
| 18. | What is the need of conditioning process in vanilla? | | CO1 | U | 1 |
| 19. | What is bleached ginger? | | CO2 | R | 1 |
| 20. | List the major cashew products that are traded in the international market. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Build the flowchart for the modern method of cashew processing. | | CO3 | E | 5 |
| 22. | Discuss the unit operations involved in the chilli processing. | | CO1 | C | 5 |
| 23. | Explain in detail the processing of tea. | | CO3 | An | 5 |
| 24. | Importance of ASTA & ESA. | | CO5 | E | 5 |
| 25. | Explain the processing of any two value added nutmeg products. | | CO2 | A | 5 |
| 26. | Interpret the health benefits of some major spices. | | CO4 | E | 5 |
| 27. | Elaborate the processing of turmeric. | | CO1 | E | 5 |
| 28. | Elaborate the processing, grading and value added product from clove. | | CO2 | A | 5 |
| 29. | Build the flowchart for processing of oil-palm. | | CO3 | C | 5 |
| 30. | Discuss the CODEX standards for coconut oil. | | CO5 | A | 5 |
| 31. | Explain in detail the packaging material requirements for spices. | | CO6 | E | 5 |
| 32. | Explain the unit operations involved in the processing of pepper. | | CO1 | E | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Elaborate the production of synthetic rubber. | CO1 | An | 7.5 |
|  | b. | Explain the virgin coconut oil processing with a neat flowchart. | CO6 | E | 7.5 |
| 34. | a. | Explain in detail time of harvesting the medicinal crops. | CO4 | E | 7.5 |
|  | b. | Explain the processing of cardamom. | CO5 | An | 7.5 |
| 35. | a. | Elaborate the unit operation of ginger. | CO3 | C | 7.5 |
|  | b. | Explain the different packaging methods of spices. | CO6 | C | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Gain knowledge in different unit operations and its equipment involved in processing of major and minor spices. |
| CO2 | Develop value added products from plantation crops and spices. |
| CO3 | Demonstrate different techniques for spices and plantaion crops with minimum post harvest losses. |
| CO4 | Acquire knowledge on importance of medicinal crops. |
| CO5 | Describe extraction methods with quality standards. |
| CO6 | Apply the knowledge on packaging and storage of spices. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 1 |  | 7.5 | 10 | 5 | 28.5 |
| CO2 | 2 | 2 | 10 |  |  |  | 14 |
| CO3 | 2 | 4 |  | 5 | 5 | 12.5 | 28.5 |
| CO4 |  |  |  |  | 12.5 |  | 12.5 |
| CO5 | 1 | 3 | 5 | 7.5 | 5 |  | 21.5 |
| CO6 |  |  |  |  | 12.5 | 7.5 | 20 |
|  | | | | | | | **125** |



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| **Course Code** | **18AT2034** | **Duration** | **3hrs** |
| **Course Name** | **FARM MACHINERY AND POWER** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What are the main functions of sprayers? | | CO4 | U | 1 |
| 2. | Name the machine, which performs the functions of a reaper, thresher and winnower. | | CO4 | R | 1 |
| 3. | Which machine is used to apply chemicals in dust form? | | CO4 | R | 1 |
| 4. | Name the weeder used in wet land. | | CO3 | R | 1 |
| 5. | Define tillage. | | CO2 | U | 1 |
| 6. | Name any four types of harrows. | | CO3 | R | 1 |
| 7. | What is the maximum power (hp) a man can develop for doing a farm work? | | CO6 | R | 1 |
| 8. | Name the pin used to connect piston and connecting rod of an engine. | | CO1 | R | 1 |
| 9. | Name any four types of harrows. | | CO3 | R | 1 |
| 10. | What should be the disc angle for good plough? | | CO3 | R | 1 |
| 11. | Name the part of IC engine which stores energy during power stroke and returns back the same energy during the idle strokes. | | CO1 | R | 1 |
| 12. | Which was the first tractor company established in India? | | CO6 | R | 1 |
| 13. | List the sources of farm power. | | CO6 | U | 1 |
| 14. | Which is the device, used to connect and disconnect the tractor engine from the transmission gears and drive wheels? | | CO1 | R | 1 |
| 15. | Which type of tractor, otherwise called as walking type tractor? | | CO6 | U | 1 |
| 16. | What is the purpose of share in a mould board plough? | | CO3 | U | 1 |
| 17. | What is the purpose the Camshaft? | | CO1 | U | 1 |
| 18. | Define Stroke. | | CO1 | R | 1 |
| 19. | What is the compression ratio of diesel engine? | | CO1 | R | 1 |
| 20. | Which type of manually operated weeders is suitable in dry lands? | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss about peg type weeder and cono weeder with a neat sketch. | | CO4 | U | 5 |
| 22. | Elaborate the different types of threshing cylinders. | | CO2 | U | 5 |
| 23. | Explain the working of any one manually operated sprayer. | | CO4 | U | 5 |
| 24. | Name the components of IC engine and briefly explain any two. | | CO1 | U | 5 |
| 25. | Discuss the calibration procedure of seed drill. | | CO2 | R | 5 |
| 26. | Explain the different types of harrows. | | CO3 | R | 5 |
| 27. | Write in detail about the Power transmission system of a tractor. | | CO1 | U | 5 |
| 28. | Distinguish between the working principle of two stroke and four stroke engine IC engine. | | CO1 | U | 5 |
| 29. | Examine the scope as well as challenges of farm mechanization in India. | | CO6 | A | 5 |
| 30. | Classify the cooling system and explain briefly. | | CO2 | R | 5 |
| 31. | Describe the formulae for finding all the Variable Cost of farm machinery. | | CO5 | R | 5 |
| 32. | List the advantages of using disc plough. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the working principle of combine harvester with a neat sketch. | CO2 | U | 7.5 |
|  | b. | Discuss in detail about the mould board plough. | CO4 | R | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Explain in detail about the Fuel system of diesel engine. | CO1 | U | 7.5 |
|  | b. | Explain the working principle of 4 stroke IC engine with a neat sketch. | CO1 | U | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Describe the formulae for finding all the Fixed Cost of farm machinery. | CO5 | R | 7.5 |
|  | b. | Explain the sources of farm power (Animal, Mechanical and Electrical). | CO6 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Analyze the working of two stroke and four stroke IC engines. |
| CO2 | Solve problems in the functioning of farm implements. |
| CO3 | Select an appropriate tillage implements needed for the farm. |
| CO4 | Experiment with different equipment used in agricultural fields from planting to harvesting. |
| CO5 | Predict the cost benefit economics of various farm implements. |
| CO6 | Illustrate the need of farm mechanization. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 5 | 31 |  |  |  |  | 36 |
| CO2 | 10 | 13.5 |  |  |  |  | 23.5 |
| CO3 | 9 | 6 |  |  |  |  | 15 |
| CO4 | 9.5 | 12 |  |  |  |  | 21.5 |
| CO5 | 12.5 | - |  |  |  |  | 12.5 |
| CO6 | 2 | 9.5 | 5 |  |  |  | 16.5 |
|  | | | | | | | **125** |



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| **Course Code** | **18AT2042** | **Duration** | **3hrs** |
| **Course Name** | **RENEWABLE ENERGY AND GREEN TECHNOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is wind turbine? | | CO2 | R | 1 |
| 2. | What is biodiesel? | | CO2 | R | 1 |
| 3. | Give one factor for efficient biogas generation. | | CO1 | A | 1 |
| 4. | How much volume can be produced from one kg of dry cattle dung? | | CO2 | A | 1 |
| 5. | Enlist the parts of biogas plant. | | CO1 | U | 1 |
| 6. | What is Jatropha oil? | | CO2 | U | 1 |
| 7. | What are the commercial primary energy resources? | | CO1 | U | 1 |
| 8. | How temperature is influencing in biogas production. | | CO4 | R | 1 |
| 9. | Enlist the types of biogas plant. | | CO3 | A | 1 |
| 10. | What is Gasification agent? | | CO4 | U | 1 |
| 11. | Define chemical Energy. | | CO1 | R | 1 |
| 12. | State the characters for the efficient bio-diesel. | | CO4 | U | 1 |
| 13. | What is Janatha Biogas Plants? | | CO3 | U | 1 |
| 14. | Define Biogas plant. | | CO5 | U | 1 |
| 15. | What is C/N ratio in bio gas plant? | | CO4 | R | 1 |
| 16. | What are the advantages of biomass? | | CO1 | R | 1 |
| 17. | What are the advantages of floating drum plant? | | CO3 | R | 1 |
| 18. | Define electrical Energy. | | CO5 | A | 1 |
| 19. | What are the major constituent of biogas? | | CO6 | R | 1 |
| 20. | List the new sources of energy. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss wind system. | | CO3 | An | 5 |
| 22. | Explain production process of Ethanol. | | CO5 | An | 5 |
| 23. | Describe natural convection solar drier. | | CO2 | U | 5 |
| 24. | Explain solar lantern. | | CO1 | R | 5 |
| 25. | Write short notes on wind electric generator. | | CO1 | A | 5 |
| 26. | Briefly explain how conversion of Photons to Electrons happens. | | CO3 | A | 5 |
| 27. | Write in details about pumped hydroelectric energy storage. | | CO3 | U | 5 |
| 28. | How Solar tunnel dryers are utilized for drying applications? | | CO5 | An | 5 |
| 29. | Explain solar photovoltaic systems. | | CO2 | R | 5 |
| 30. | Describe forced convection Solar Drier for Drying of Grains. | | CO3 | R | 5 |
| 31. | Explain the importance of bio-fuel production in India. | | CO4 | U | 5 |
| 32. | Discuss photovoltaic and Photovoltaic Cells. | | CO1 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain gravitational Potential Energy. | CO6 | C | 7 |
|  | b. | If 2.91 kWh is available as electrical energy from 32 kg of Cow dung then how m0any bulbs and fan can consume the same? | CO6 | C | 8 |
|  |  |  |  |  |  |
| 34. | a. | Discuss in brief the future of renewable energy in India. | CO3 | An | 8 |
|  | b. | Explain the working principle of a Solar water heater. | CO5 | An | 7 |
|  |  |  |  |  |  |
| 35. | a. | Describe working of a Turbine Generator. | CO6 | E | 7 |
|  | b. | Calculate the Digester volume for 25 kg of cow dung and 25 l water. | CO4 | E | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Gain basic knowledge of Solar energy harvesting. |
| CO2 | Familiarize with different types of Solar energy gadgets. |
| CO3 | Understand the contributions of energy sources to agriculture. |
| CO4 | Remember different types of biogas production structures. |
| CO5 | Design renewable energy structures. |
| CO6 | Analyze the green energy techniques. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 5 | 7 | 5 |  |  |  |  |
| CO2 |  | 5 | 2 | 5 |  |  |  |
| CO3 |  | 3 | 2 | 5 | 3 |  |  |
| CO4 |  |  | 7 | 3 |  | 4 |  |
| CO5 |  |  |  | 4 | 18 | 14 |  |
| CO6 |  |  |  |  | 15 | 16 |  |
|  | | | | | | | **125** |



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| **Course Code** | **18AT2043** | **Duration** | **3hrs** |
| **Course Name** | **PROTECTED CULTIVATION AND SECONDARY AGRICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Partial regulation of micro climate in the green house will minimize the crop loss due to \_\_\_\_\_\_\_\_\_\_\_.   1. Biotic Stress B. Abiotic Stress C. Natural Phenomenon D. Disease | | CO2 | U | 1 |
| 2. | A major technology to provide development of healthy graft seedlings and hardening for various horticultural crops irrespective of climatic condition is known as \_\_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 3. | Modification of Natural Environment to modify the maximum growth of the plant is known as \_\_\_\_\_\_\_\_\_\_\_\_\_ | | CO1 | An | 1 |
| 4. | Piezometer is an instrument used for measurement of \_\_\_\_\_\_\_\_\_\_. | | CO1 | A | 1 |
| 5. | The phenomenon of increase in the ambient temperature due to the formation of the blanket carbon dioxide is known as \_\_\_\_\_\_\_\_\_\_. | | CO2 | E | 1 |
| 6. | Which year the National Committee on Plasticulture Applications in Horticulture is established? | | CO6 | An | 1 |
| 7. | The wavelength of Photosynthetically Active Radiation is \_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 8. | Most suitable type of green house in Indian Condition is \_\_\_\_\_\_\_\_.   1. Single standing B. Uneven Span Type C. Quonset type   D. Double standing | | CO1 | C | 1 |
| 9. | \_\_\_\_\_\_\_\_\_\_\_is defined as the amount of heat flow through unit thickness of material over a unit area per unit time for unit temperature difference. | | CO6 | A | 1 |
| 10. | \_\_\_\_\_\_\_\_\_\_\_\_\_ refers to removal of moisture to very low levels usually to bone dry condition. | | CO4 | An | 1 |
| 11. | Amount of moisture /water contained in the food grain (product) is called as \_\_\_\_\_\_\_\_\_\_. | | CO4 | U | 1 |
| 12. | Which type of greenhouse is suited for hilly terrain? | | CO2 | R | 1 |
| 13. | \_\_\_\_\_\_\_\_\_is the process of allowing the fresh air to enter in to the enclosed area by driving out the air with undesirable properties. | | CO1 | U | 1 |
| 14. | The light intensity is measured by the international unit known as \_\_\_\_\_. | | CO2 | R | 1 |
| 15. | The air velocity at which an object remains in a suspended state in a vertical pipe under the action of the air current is called \_\_\_\_\_\_\_of the object. | | CO6 | C | 1 |
| 16. | \_\_\_\_\_\_is a measure of the sharpness of the solid material. | | CO6 | C | 1 |
| 17. | Define: Specific Heat. | | CO2 | U | 1 |
| 18. | Expand: EMC. | | CO3 | R | 1 |
| 19. | Define: Thermal Conductivity. | | CO3 | U | 1 |
| 20. | Expand: CFC. | | CO2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate Direct and Indirect Methods of Moisture Measurements. | | CO4 | U | 5 |
| 22. | Briefly explain the factors affecting grain drying and its impact on post-harvest Management. | | CO4 | R | 5 |
| 23. | What do you mean by Greenhouse effect and list out the advantages of Greenhouse Technology? | | CO1 | An | 5 |
| 24. | Elaborate the types of green house in context with utility and shape. | | CO3 | C | 5 |
| 25. | Discuss the role of CO2 and Relative Humidity on the growth and development of crop plants and how they are managed in protected cultivation. | | CO2 | U | 5 |
| 26. | Write a note on “Forced ventilated greenhouse” | | CO2 | R | 5 |
| 27. | Suggest the suitable criteria for site selection and orientation of Green House. | | CO2 | An | 5 |
| 28. | Describe the usage of different equipment in an Evaporative cooling system in a green house. | | CO3 | A | 5 |
| 29. | How will you design low-cost greenhouse for marginal and small farmers? | | CO1 | U | 5 |
| 30. | Simplify the term 'Food Processing and Preservation’. | | CO4 | C | 5 |
| 31. | How fog and mist work for propagation under protected cultivation? | | CO3 | An | 5 |
| 32. | What do you mean by Mechanical drying of grains? Discuss the strength and weakness of these dryers. | | CO5 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Define the following terms with mathematical expression.   1. Coefficient of friction 2. Porosity 3. Sphericity | CO3 | U | 7.5 |
|  | b. | Explain rules of watering and analyze the merits and demerits of the following irrigation methods.   1. Overhead Sprinkler Irrigation 2. Drip Irrigation 3. Perimeter Irrigation | CO3 | R | 7.5 |
| 34. | a. | List out the Material handling Equipments with diagrams. | CO6 | A | 7.5 |
|  | b. | Analyze the major factors need to be controlled during handling and processing of food to maintain quality. | CO6 | An | 7.5 |
| 35. | a. | Explain the working principle and advantages of LSU dryer with neat sketches. | CO5 | E | 7.5 |
|  | b. | Briefly explain the theory and methods of grain drying. | CO5 | E | 7.5 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Plan and design low-cost green houses. |
| CO2 | Predict the plant responses to greenhouse environment. |
| CO3 | Estimate the cost benefit economics of protected cultivation. |
| CO4 | Understand engineering properties of food materials. |
| CO5 | Explain the working of commercial grain dryers. |
| CO6 | Illustrate the material handling equipment. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 6 | 1 | 6 | - | 1 | 14 |
| CO2 | 9 | 8 | - | 5 | 1 | - | 23 |
| CO3 | 8.5 | 8.5 | 5 | 5 | - | 5 | 32 |
| CO4 | 5 | 6 | - | 1 | - | 5 | 17 |
| CO5 | - | - | 5 | - | 15 | - | 20 |
| CO6 | - | - | 8.5 | 8.5 | - | 2 | 19 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **18HO1001/17AG1010** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF HORTICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention the divisions of Horticulture. | | CO1 | R | 1 |
| 2. | Mention the vitamin present in mango. | | CO1 | R | 1 |
| 3. | Word pomology derived from \_\_\_\_\_\_\_\_ language. | | CO1 | R | 1 |
| 4. | Define layering. | | CO1 | R | 1 |
| 5. | Write any two commonly occurring diseases at nursery stage. | | CO3 | R | 1 |
| 6. | Mention three different types of cutting propagation. | | CO3 | An | 1 |
| 7. | What is interstock in grafting. | | CO3 | R | 1 |
| 8. | Give two examples for perennial vegetables. | | CO3 | R | 1 |
| 9. | Write two examples for cut flowers. | | CO1 | R | 1 |
| 10. | Define mixed cropping. | | CO4 | R | 1 |
| 11. | Expand IIVR and IIHR. | | CO1 | R | 1 |
| 12. | Name the national fruit of India. | | CO4 | R | 1 |
| 13. | Mention the commonly using media in air layering. | | CO3 | An | 1 |
| 14. | Write the mode of propagation in Banana. | | CO3 | R | 1 |
| 15. | Name two internal factors affecting growth and development of plant. | | CO1 | R | 1 |
| 16. | What are day neutral plants? | | CO4 | R | 1 |
| 17. | Define fertigation. | | CO5 | An | 1 |
| 18. | What is polyembryony? | | CO5 | R | 1 |
| 19. | Name any two salad vegetables. | | CO1 | R | 1 |
| 20. | What is C:N ratio? | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the internal factors which influence growth and development of plants. | | CO5 | An | 5 |
| 22. | What is asexual propagation, and explain cutting type of propagation method. | | CO3 | U | 5 |
| 23. | Mention the classification of nursery and nursery beds, with advantages of nursery production. | | CO5 | R | 5 |
| 24. | Explain the role of hormones in plant growth and development. | | CO3 | An | 5 |
| 25. | Write the difference between sexual and asexual mode of propagation in plants. | | CO3 | R | 5 |
| 26. | Explain contour planting system and its advantages. | | CO4 | R | 5 |
| 27. | Define clean culture, mulching, sod and sod mulch. | | CO4 | U | 5 |
| 28. | Discuss the methods of fertilizer application. | | CO5 | R | 5 |
| 29. | Difference between intercropping and mixed cropping. | | CO4 | U | 5 |
| 30. | Discuss the botanical classification of fruits. | | CO1 | R | 5 |
| 31. | Discuss square system of planting method. | | CO4 | R | 5 |
| 32. | Explain irrigation and types of irrigation methods followed in orchard. | | CO4 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain grafting, and its types with suitable example. | CO3 | R | 7.5 |
|  | b. | Classify the fruit crops based on climate requirement. | CO3 | An | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Enumerate the causes of graft incompatibility, and how to overcome it? | CO3 | R | 7.5 |
|  | b. | Write the important cultural practices fallowed in Horticulture crops. | CO2 | R | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write a detailed note on orchard, and its management. | CO4 | U | 7.5 |
|  | b. | Discuss the scope and importance of horticultural crops. | CO1 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Definitions, importance-scope of horticultural crops, branches, methods and techniques. |
| CO2 | Agro climatic zones of India. |
| CO3 | Different methods of plant propagation . |
| CO4 | Different types of planting systems and irrigation, training and pruning. |
| CO5 | Apply principles of orchard management and nursery. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 14.5 | - | - | - | - | - | 14.5 |
| CO2 | 13.5 | 5 | - | - | - | - | 17.5 |
| CO3 | 6 | - | - | 6 | - | - | 10 |
| CO4 | 27 | 20 | - | 6 | - | - | 53 |
| CO5 | 13.5 | 5 | - | 8.5 | - | - | 27 |
| CO6 | - | - | - | - | - | - |  |
|  | | | | | | | **125** |



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| **Course Code** | **18HO2013** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF ORNAMENTAL HORTICULTURE AND LANDSCAPE ARCHITECTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name two garden adornments which can create mobility in landscaping. | | CO1 | A | 1 |
| 2. | Name two cycads with botanical names. | | CO2 | R | 1 |
| 3. | Mention any two species of lawn grass for tropical climate. | | CO4 | R | 1 |
| 4. | What do you mean by focalization in landscaping? | | CO1 | E | 1 |
| 5. | Define arboriculture. | | CO2 | R | 1 |
| 6. | List two seasonal flowering annuals with botanical names. | | CO2 | An | **1** |
| 7. | Name two plant groups generally suitable for xeriscaping or landscaping desert regions. | | CO4 | R | **1** |
| 8. | The art of training shrubs imitating animate and inanimate objects is called ---------. | | CO2 | R | 1 |
| 9. | Japanese style of flower arrangement is known as ---------------. | | CO4 | R | 1 |
| 10. | Name two famous contemporary gardens developed in independent India. | | CO3 | A | 1 |
| 11. | Name two utility structures proposed in landscape design. | | CO1 | R | 1 |
| 12. | Name two structures proposed for elevation changes in landscape design. | | CO1 | R | 1 |
| 13. | Name two garden adornments proposed in landscape design. | | CO1 | R | 1 |
| 14. | When geometry, symmetry and axis are followed in landscape design it is known as ---------- style of gardening. | | CO1 | R | 1 |
| 15. | Name two bulbous ornamental flowers with botanical name. | | CO1 | R | 1 |
| 16. | Name two softwares used for landscape designing. | | CO5 | R | 1 |
| 17. | Cultivation of trees for the purpose of science, education, recreation and landscaping is known as ------------------ . | | CO1 | R | 1 |
| 18. | A garden laid below normal ground level is known as ------------ garden while a garden laid above normal ground level is known as --------- garden. | | CO1 | R | 1 |
| 19. | Define landscaping. | | CO1 | R | 1 |
| 20. | Name the garden city of India and one famous garden located there. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the features of Mughal Garden. | | CO3 | U | 5 |
| 22. | Summarize the principle of terrarium along with the method of establishment. | | CO6 | C | 5 |
| 23. | Differentiate between formal and informal style landscape design. | | CO1 | An | 5 |
| 24. | What is avenue planting? What are designs employed and plants suitable? | | CO2 | An | 5 |
| 25. | Differentiate between terrace garden and sunken garden. | | CO4 | An | 5 |
| 26. | Discuss the functional uses of climbers and creepers in landscaping with examples. | | CO3 | U | 5 |
| 27. | Differentiate between cacti and succulents. How they can be exploited in landscaping? | | CO2 | An | 5 |
| 28. | Briefly explain Terrarium and bottle garden, planting media used, planting, tools and suitable plants. | | CO4 | U | 5 |
| 29. | Explain planning, designing and establishment of water garden. | | CO4 | U | 5 |
| 30. | Differentiate between edges and hedges with examples of plants used. | | CO2 | U | 5 |
| 31. | Discuss urban landscaping. | | CO5 | U | 5 |
| 32. | Enumerate bonsai design styles. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss in detail about home landscaping. | CO5 | C | 7.5 |
|  | b. | Explain the vertical gardening concept, its significance, types and plants used. | CO3 | U | 7.5 |
| 34. | a. | What are the different maintenance and aftercare operations for lawn grass? | CO3 | U | 7.5 |
|  | b. | Discuss the different methods of flower arrangement with illustrations. | CO4 | An | 7.5 |
| 35. | a. | Describe the steps involved in planning and lay out of landscape projects. | CO6 | U | 7.5 |
|  | b. | Elaborate the scope and importance of landscaping. | CO1 | C | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the principles of ornamental horticulture and landscape design. |
| CO2 | Explain about the different ornamental crops and its suitability to different landscapes. |
| CO3 | Distinguish the different garden types of India and in abroad. |
| CO4 | Design the lawns, floral arrangements, terrariums, xeriscaping and bonsai making. |
| CO5 | Discover different landscaping designs and architectures using AutoCAD and ArchCAD. |
| CO6 | Identify the factors affecting the landscape design and planning. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 8 | - | 1 | 5 | 1 | 7.5 | 22.5 |
| CO2 | 3 | 10 | 1 | 5 | - | - | 19 |
| CO3 | 2 | 25 | - | - | - | - | 27 |
| CO4 | 3 | 15 | - | 12.5 | - | - | 30.5 |
| CO5 | 1 | 5 | - | - | - | 7.5 | 13.5 |
| CO6 | - | 7.5 | - | - | - | 5 | 12.5 |
|  | | | | | | | 125.00 |



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| **Course Code** | **18HO2014** | **Duration** | **3hrs** |
| **Course Name** | **DRYLAND HORTICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | In oasis effect \_\_\_\_\_\_\_\_\_\_\_ will have higher soil water availability. | | CO3 | R | 1 |
| 2. | In clothesline effect \_\_\_\_\_\_\_\_\_\_is observed. | | CO2 | A | 1 |
| 3. | \_\_\_\_\_\_\_\_\_\_\_ is a method of reducing evapotranspiration. | | CO2 | E | 1 |
| 4. | When water is reused \_\_\_\_\_\_\_\_\_\_\_\_ is a problem. | | CO3 | U | 1 |
| 5. | Crop zoning is done for improving \_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 6. | Seepage losses can be reduced by\_\_\_\_\_\_\_ irrigation method. | | CO2 | R | 1 |
| 7. | National program (1985) for optimization of water use was established in \_\_\_\_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 8. | The project taken up in Krishna Godavari basin in India was an example of | | CO1 | R | 1 |
| 9. | \_\_\_\_\_\_\_\_\_\_\_ relationship is a critical consideration for on farm water management. | | CO4 | R | 1 |
| 10. | \_\_\_\_\_\_\_\_\_\_ is one of the most important abiotic factor limiting the productivity and quality of horticultural crops. | | CO2 | R | 1 |
| 11. | Precise and direct application of water to the root zone is \_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 12. | \_\_\_\_\_\_\_\_\_\_\_\_ is not a result of drought. | | CO2 | A | 1 |
| 13. | Early flowering is a kind of \_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 14. | Synthesis of proline is a mechanism of \_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 15. | Increased water uptake is a mechanism of \_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 16. | Drought tolerant plants will synthesize . | | CO2 | R | 1 |
| 17. | Reduced leaf size and stem extension are results of \_\_\_\_\_\_\_\_\_\_ response due to drought. | | CO2 | A | 1 |
| 18. | Stomatal closure is a \_\_\_\_\_\_\_\_\_\_\_ response. | | CO5 | R | 1 |
| 19. | Closing of stomata leads to \_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 20. | When exposed to drought stress, high level of \_\_\_\_\_\_\_\_\_\_\_\_ is produced. | | CO2 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Elaborate the canopy management that helps the plant to survive better in arid regions. | | CO1 | R | 5 |
| 22. | Describe the rain water harvesting and water recycling techniques. | | CO1 | A | 5 |
| 23. | Define germplasm and their role in dry land horticulture. | | CO1 | U | 5 |
| 24. | Discuss the commercial importance of arid horticulture crops. | | CO2 | R | 5 |
| 25. | Explain suitable propagation methods of different arid fruit crops. | | CO2 | A | 5 |
| 26. | Describe the prospects of dryland horticulture. | | CO2 | U | 5 |
| 27. | Discuss about the mechanism to improve water uptake. | | CO3 | A | 5 |
| 28. | Discuss about the new technologies followed in dryland horticulture for crop production. | | CO3 | A | 5 |
| 29. | Elaborate socio-economic, technological, constraints of dryland. | | CO3 | R | 5 |
| 30. | Explain different types of mulches and their merits. | | CO4 | A | 5 |
| 31. | Write in detail the biological and mechanical methods of soil conservation. | | CO4 | U | 5 |
| 32. | Elaborate the limitations encountered in dry land horticulture. | | CO4 | E | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the promising characters to select plants for dry land farming. | CO3 | U | 8 |
|  | b. | Define evapotranspiration and write in detail about the methods of reducing evapotranspiration. | CO1 | R | 7 |
| 34. | a. | Define pruning and elaborate its role in canopy management. | CO4 | E | 7 |
|  | b. | Elaborate the mechanism to improve water uptake. | CO3 | A | 8 |
| 35. | a. | Explain the characteristics and special adaptation of different types of arid fruit crops. | CO4 | U | 8 |
|  | b. | Write in detail the types and design of bench terraces for soil erosion control. | CO3 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the scenario of dryland horticulture in India. |
| CO2 | Explain different water conservation techniques used. |
| CO3 | Acquire the knowledge on different crops suitable to dryland areas. |
| CO4 | Apply dryland farming techniques for various agro climatic regions. |
| CO5 | Identify the suitable drought resistant crops. |
| CO6 | Develop special package of practices for dryland horticultural crops. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 14 | 5 | 5 | - | - | - | 24 |
| CO2 | 8 | 8 | 9 | - | 1 | - | 26 |
| CO3 | 13 | 9 | 18 | - | - | - | 40 |
| CO4 | 2 | 13 | 5 | - | 12 | - | 32 |
| CO5 | 1 | - | - | - | - | - | 1 |
| CO6 | 2 | - | - | - | - | - | 2 |
|  | | | | | | | **125** |



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| **Course Code** | **18HO2023** | **Duration** | **3hrs** |
| **Course Name** | **NEMATODE PESTS OF HORTICULTURAL CROPS AND THEIR MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Nematodes belong to phylum \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 2. | Forking of tap root symptom in carrot was caused by \_\_\_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 3. | The method used for extraction of cyst nematodes is \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 4. | \_\_\_\_\_\_\_\_\_\_ is a protrusible and needle like organ in plant parasitic nematode used for sucking plant juices. | | CO2 | U | 1 |
| 5. | Example for smallest nematode. | | CO1 | R | 1 |
| 6. | Sexual dimorphism has been observed in \_\_\_\_\_\_\_\_\_\_ nematode. | | CO1 | R | 1 |
| 7. | The movement of spicules is guided by a sclerotized plate-like structure is known as \_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 8. | Scientific name for burrowing nematode \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 9. | \_\_\_\_\_\_\_\_\_\_ are the paired sensory structures located laterally in the cephalic region. | | CO2 | U | 1 |
| 10. | Example for nematode trap crop is \_\_\_\_\_. | | CO5 | R | 1 |
| 11. | \_\_\_\_\_\_\_\_\_\_ nematode ranks first as far as damage to crops at global level is concerned. | | CO4 | U | 1 |
| 12. | Father of nematology is \_\_\_\_\_\_\_ | | CO2 | R | 1 |
| 13. | Females possess only one gonoduct means \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 14. | Give an example for granular nematicide. | | CO6 | R | 1 |
| 15. | The single specialized cell in glandular excretory system is called as \_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 16. | \_\_\_\_\_\_\_\_\_\_ cause leaf chlorosis in coffee. | | CO4 | R | 1 |
| 17. | In plant parasitic nematodes, the only part visible in whole mounts is \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 18. | Symptoms of root knot on \_\_\_\_\_\_\_\_\_\_ crops are very discrete | | CO3 | R | 1 |
| 19. | The lethal temperature for control of plant parasitic nematodes is around \_\_\_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 20. | The other name of curly tip symptom is \_\_\_\_\_\_\_\_\_\_. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the general characteristics of plant parasitic nematode. | | CO1 | An | 5 |
| 22. | Define: Bilateral symmetry, Pseudocoel, Helminthology, Ectoparasite and Endoparasite. | | CO2 | U | 5 |
| 23. | Draw the morphology of typical plant parasitic nematode and label the parts. | | CO1 | U | 5 |
| 24. | Explain various sensory structures in plant parasitic nematode. | | CO2 | An | 5 |
| 25. | Draw and describe the various shapes of plant parasitic nematode with examples. | | CO3 | U | 5 |
| 26. | Write an elaborate note on symptoms produced by plant parasitic nematode. | | CO4 | An | 5 |
| 27. | Give a brief note on respiratory and circulatory system of nematodes. | | CO2 | U | 5 |
| 28. | Explain: Hermaphrodite, Parthenogenesis, Spicule, Gubernaculum and bursa. | | CO1 | U | 5 |
| 29. | Write any ten common and scientific names of plant parasitic nematode. | | CO3 | An | 5 |
| 30. | Give an elaborate note on nematode pests of Grapevine and Citrus. | | CO6 | U | 5 |
| 31. | Give an account of male reproductive system with suitable diagram. | | CO2 | An | 5 |
| 32. | Write an elaborate note on morphological characters of banana burrowing nematode. | | CO5 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe the economic importance of plant parasitic nematode. | CO2 | U | 8 |
|  | b. | Describe the nematode pests of vegetables and their management. | CO3 | An | 7 |
| 34. | a. | Describe the structure and function of Digestive system of plant parasitic nematode. | CO1 | U | 8 |
|  | b. | Explain briefly on nematode pests of plantation crops and their management. | CO3 | An | 7 |
| 35. | a. | Explain excretory system of plant parasitic nematode with diagram. | CO2 | U | 8 |
|  | b. | Discuss briefly on integrated nematode management. | CO6 | An | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Have a clear knowledge about the various morphological and taxonomical classifications of  nematode. |
| CO2 | Identify the type of nematodes based on morphology and symptoms. |
| CO3 | Identify the nematode symptoms in plants and suggest suitable Management practices. |
| CO4 | Understand the nematode disease complexes in plants. |
| CO5 | Apply the Integrated Nematode Management (INM) practices in the field. |
| CO6 | Analyze and develop advanced nematode control measures. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 6 | 18 | - | 5 | - | - | 29 |
| CO2 | 2 | 29 | - | 10 | - | - | 41 |
| CO3 | 2 | 6 | - | 19 | - | - | 27 |
| CO4 | 1 | 2 | - | 5 | - | - | 8 |
| CO5 | 1 | 6 | - | - | - | - | 7 |
| CO6 | 1 | 5 | - | 7 | - | - | 13 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1002** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTORY AGRO-METEOROLOGY & CLIMATE CHANGE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Brief about Agricultural Drought. | | CO5 | R | 1 |
| 2. | Define GHG effect. | | CO1 | A | 1 |
| 3. | The height of the ozone layer from the earth's surface is from \_\_\_\_ to \_\_\_\_. | | CO6 | U | 1 |
| 4. | Define relative humidity. | | CO6 | R | 1 |
| 5. | Expand IITM. | | CO1 | U | 1 |
| 6. | Define climate. | | CO1 | R | 1 |
| 7. | The Troposphere layer of atmosphere is also called\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 8. | Define Cloud seeding. | | CO2 | R | 1 |
| 9. | Expand GDD. | | CO6 | U | 1 |
| 10. | The \_\_\_\_\_\_is the imaginary lines joins the places having the same rainfall. | | CO1 | R | 1 |
| 11. | Expand the term IMD. | | CO2 | U | 1 |
| 12. | Give the types of weather forecasting. | | CO4 | U | 1 |
| 13. | Expand MoES. | | CO2 | U | 1 |
| 14. | Define meteorology. | | CO2 | R | 1 |
| 15. | Give the different forms of precipitation. | | CO3 | U | 1 |
| 16. | Give the formula for Heliothermal unit. | | CO3 | R | 1 |
| 17. | Define temperature. | | CO3 | U | 1 |
| 18. | Brief about sea breeze. | | CO6 | A | 1 |
| 19. | Expand NEM. | | CO4 | U | 1 |
| 20. | \_\_\_\_\_\_are the imaginary lines that connect places on a map that have the same atmospheric temperature. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate meteorology and agrometeorology. | | CO2 | U | 5 |
| 22. | Define (i) Rain (ii) Snow (iii) Sleet and (iv) Hailstorm. | | CO4 | A | 5 |
| 23. | Discuss about southwest monsoon mechanism in India with neat diagram. | | CO2 | A | 5 |
| 24. | Explain solar constant and albedo. | | CO6 | A | 5 |
| 25. | List out the weather abnormalities and explain forest fire with a current example. | | CO5 | U | 5 |
| 26. | Explain in detail about Artificial rainmaking. | | CO3 | A | 5 |
| 27. | Discuss about different types of weather forecasting and its uses in agriculture. | | CO1 | R | 5 |
| 28. | Discuss about ozone layer depletion. | | CO3 | R | 5 |
| 29. | Define wind and explain different types of wind. | | CO2 | R | 5 |
| 30. | Differentiate climate and weather. | | CO3 | U | 5 |
| 31. | Describe about radiation laws. | | CO5 | A | 5 |
| 32. | Explain weather conditions such as heat wave and cold wave as per IMD norms. | | CO5 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Define agrometeorology and explain its scope. | CO2 | U | 7.5 |
|  | b. | Define with neat diagram (i) cyclone (ii) anticyclone (iii) land breeze. | CO4 | A | 7.5 |
|  |  |  |  |  |  |
| 34. |  | Explain (i) atmospheric temperature (ii) temperature inversion (iii) lapse rate (iv) daily and seasonal variations of temperature (v) vertical profile of temperature with diagram. | CO2 | R | 15 |
|  |  |  |  |  |  |
| 35. | a. | Explain different types of weather forecast and their uses. | CO3 | R | 7.5 |
|  | b. | Explain the climate change and its impact on agriculture. | CO6 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the significance of agricultural metrology, climate and weather. |
| CO2 | Discuss the various atmospheric weather variables and its significance in crop production. |
| CO3 | Understand crop weather relationships for efficient crop production. |
| CO4 | Acquire knowledge on weather forecasting techniques and effect of climate change on crop  Production. |
| CO5 | Describe artificial rainmaking, precipitation, monsoons and its importance in Indian Agriculture. |
| CO6 | Discuss global warming, and its effect on regional and national agriculture. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 8 | 1 | 1 |  |  |  | 10 |
| CO2 | 22 | 14.5 | 5 |  |  |  | 41.5 |
| CO3 | 13.5 | 7 | 5 |  |  |  | 25.5 |
| CO4 | 1 | 2 | 12.5 |  |  |  | 15.5 |
| CO5 | 1 | 10 | 5 |  |  |  | 16 |
| CO6 | 1 | 2 | 13.5 |  |  |  | 16.5 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1003** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF GENETICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is transcription? | | CO5 | U | 1 |
| 2. | The term ‘gene’ was coined by \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | Aneuploid lacking a pair of chromosomes is called \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 4. | The alternate expression of the same gene is called \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 5. | What is ‘Sex linkage’? | | CO2 | U | 1 |
| 6. | The point of contact established between non-sister chromatids during meiosis is called \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 7. | The organelle known as the power house of cell is \_\_\_\_\_\_\_\_\_. | | CO6 | U | 1 |
| 8. | Exchange of chromosomal segments between non-sister chromatids of homologous chromosomes is called \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 9. | What is meant by ‘translocation’? | | CO3 | U | 1 |
| 10. | What is point mutation? | | CO4 | U | 1 |
| 11. | Mitotic division is otherwise called \_\_\_\_\_\_\_\_\_\_ division. | | CO2 | U | 1 |
| 12. | Name the cell organelle associated with protein synthesis. | | CO6 | R | 1 |
| 13. | Name the nucleotide bases present in DNA. | | CO5 | R | 1 |
| 14. | The smallest unit of mutation is called \_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 15. | Define ‘Linkage’. | | CO2 | U | 1 |
| 16. | The gametic chromosome number of an organism is called \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 17. | Give examples of mutagens. | | CO4 | U | 1 |
| 18. | Give an example of multiple allele. | | CO1 | R | 1 |
| 19. | What is meant by transversion? | | CO3 | U | 1 |
| 20. | Name the scientist who proposed the double helical structure of DNA. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate “Quantitative trait” and ‘Qualitative trait”. | | CO1 | An | 5 |
| 22. | Describe the structure of chromosome with a neat diagram. | | CO5 | U | 5 |
| 23. | What are the different types of sex determination? | | CO1 | R | 5 |
| 24. | What is multiple allelism? Explain the inheritance of blood group. | | CO1 | U | 5 |
| 25. | Differentiate auto and allopolyploids. | | CO3 | An | 5 |
| 26. | Explain epistasis with example. | | CO1 | U | 5 |
| 27. | What are the characters of genetic code? | | CO3 | An | 5 |
| 28. | What is cytoplasmic inheritance? Examples. | | CO6 | U | 5 |
| 29. | Write the difference between Monoploid, haploid and diploid. | | CO3 | An | 5 |
| 30. | Differentiate ‘Back cross’ and ‘Test cross’. | | CO1 | U | 5 |
| 31. | What is structural chromosomal aberration? List its types and subtypes? | | CO3 | An | 5 |
| 32. | Differentiate incomplete dominance and co dominance. | | CO1 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | List out the different stages of meiosis. Explain the sub stages of prophase 1. | CO2 | A | 7 |
|  | b. | What are the numerical variations in chromosome? Explain different types. | CO3 | U | 8 |
| 34. | a. | Explain Mendel’s Laws of Inheritance. | CO1 | R | 7 |
|  | b. | Explain Mitosis with neat diagram and its significance. | CO2 | E | 8 |
| 35. | a. | Define mutation? Explain its different types. | CO4 | U | 7 |
|  | b. | Define DNA replication, explain the different modes of DNA replication. | CO5 | An | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Solve problems on Mendelian genetics. |
| CO2 | Construct gene map using linkage. |
| CO3 | Identify the type of aberrations and its usage in agriculture. |
| CO4 | Understand inducing mutation by artificial methods. |
| CO5 | Explain the central dogma of life. |
| CO6 | Adopt the knowledge of cytoplasmic inheritance in plant breeding. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 15 | 20 | - | 5 | - | - | 40 |
| CO2 | - | 3 | 7 | - | 8 | - | 18 |
| CO3 | 4 | 10 | - | 20 | - | - | 34 |
| CO4 | 1 | 9 | - | - | - | - | 10 |
| CO5 | 1 | 7 | - | 8 | - | - | 16 |
| CO6 | 1 | 6 | - | - | - | - | 7 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1005** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTION TO FORESTRY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is the total accounts for scrub forest in India? | | CO4 | R | 1 |
| 2. | Name any two fodder grasses. | | CO6 | U | 1 |
| 3. | Mention any two trees for shelterbelt. | | CO5 | U | 1 |
| 4. | Mention the botanical name of casuarina. | | CO1 | R | 1 |
| 5. | Name any two medicinal trees. | | CO3 | U | 1 |
| 6. | Define clonal propagation. | | CO6 | R | 1 |
| 7. | ICFRE stands for \_\_\_\_\_\_\_\_\_\_\_\_ | | CO5 | R | 1 |
| 8. | Mention the botanical name of banyan tree. | | CO1 | R | 1 |
| 9. | Write the botanical name of palmyrah. | | CO2 | R | 1 |
| 10. | Where the taungya system was first evolved? | | CO1 | U | 1 |
| 11. | Who introduced taungya system? | | CO1 | U | 1 |
| 12. | Which is the national tree of India? | | CO1 | U | 1 |
| 13. | Mention any two woody trees. | | CO1 | U | 1 |
| 14. | Write the components of silvi-olericulture. | | CO2 | R | 1 |
| 15. | Name two fuel wood tree species. | | CO1 | R | 1 |
| 16. | When was the forest conservation Act passed? | | CO6 | R | 1 |
| 17. | Write the botanical name of pungam. | | CO3 | R | 1 |
| 18. | Define scrub. | | CO5 | R | 1 |
| 19. | What is the total percentage of low dense forest in India? | | CO3 | U | 1 |
| 20. | Define deciduous forest. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the alley cropping and pollarding. | | CO3 | E | 5 |
| 22. | Discuss on multispecies and multitier cropping system. | | CO4 | U | 5 |
| 23. | Discuss the detailed note on shifting cultivation. | | CO2 | U | 5 |
| 24. | Classify the forestry based on evergreen and deciduous tree. | | CO6 | U | 5 |
| 25. | Detailed note on role of forestry. | | CO2 | U | 5 |
| 26. | Differentiate between the reforestation and afforestation. | | CO1 | E | 5 |
| 27. | Write the concept of agroforestry. | | CO1 | E | 5 |
| 28. | Differentiate between even age forest and uneven age forest. | | CO4 | U | 5 |
| 29. | Describe taungya system. | | CO3 | U | 5 |
| 30. | Discuss about the coppicing and its advantages. | | CO4 | U | 5 |
| 31. | Differentiate between the climate and microclimate. | | CO5 | E | 5 |
| 32. | Differentiate between nutrient cycle and carbon cycle. | | CO5 | E | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss a detailed note on limitation of forestry. | CO4 | E | 7 |
|  | b. | Classify the types of forest in India and describe it. | CO3 | E | 8 |
|  |  |  |  |  |  |
| 34. | a. | Discuss about the concept and importance of social forestry. | CO2 | E | 8 |
|  | b. | Write a detailed note on carbon sequestration and climate change. | CO5 | R | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain the scope and importance of forestry. | CO5 | R | 7 |
|  | b. | Give a detailed note on natural and artificial regeneration. | CO4 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the forest eco system and forest regeneration. |
| CO2 | Remember the concepts of agroforestry practiced in various agro ecosystems. |
| CO3 | Apply the knowledge for developing agro forestry, wind breaks, shelter belts, silviculture and social forestry. |
| CO4 | Recall the multipurpose trees in agroforestry systems. |
| CO5 | Analyze the impact of nitrogen fixation, carbon sequestration and develop strategies for climate mitigation. |
| CO6 | Explain the beneficial effects of agro forestry in relation to nitrogen fixation, soil conservation, litter dynamics and nutrient cycles. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 4 | - | - | 10 | - | 17 |
| CO2 | 2 | 10 | - | - | 8 | - | 20 |
| CO3 | 1 | 7 | - | - | 13 | - | 21 |
| CO4 | 1 | 23 | - | - | 7 | - | 31 |
| CO5 | 16 | 1 | - | - | 10 | - | 27 |
| CO6 | 3 | 6 | - | - | 0 | - | 9 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1006** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF SOIL SCIENCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is swelling and shrinkage of clays? | | CO2 | U | 1 |
| 2. | What is organic colloid? | | CO3 | R | 1 |
| 3. | Who is the father of soil science? | | CO1 | R | 1 |
| 4. | Name the book used to measure the soil colour taxonomically. | | CO2 | R | 1 |
| 5. | Expand ISSS. | | CO2 | R | 1 |
| 6. | What is skeleton of soil? | | CO2 | U | 1 |
| 7. | Define Field capacity. | | CO2 | U | 1 |
| 8. | Write the composition of CO2 in soil air. | | CO2 | R | 1 |
| 9. | Define soil science defined by Jenny. | | CO1 | U | 1 |
| 10. | Define soil pollution. | | CO4 | U | 1 |
| 11. | Name the process of peeling of rock surfaces. | | CO1 | R | 1 |
| 12. | Classify of pH of soil. | | CO3 | An | 1 |
| 13. | What is chroma? | | CO2 | R | 1 |
| 14. | Define sedimentary rock with example. | | CO1 | U | 1 |
| 15. | What is Elluviation? | | CO1 | R | 1 |
| 16. | What is upper plastic limit? | | CO2 | U | 1 |
| 17. | \_\_\_\_\_\_\_\_\_\_\_ is called as the flesh of the soil. | | CO2 | U | 1 |
| 18. | List out the master horizons of soil profile. | | CO1 | R | 1 |
| 19. | Relative proportion of sand, silt and clay is called. | | CO2 | U | 1 |
| 20. | Process of rock weathering by soil flora and fauna is called. | | CO1 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain physical weathering of soil. | | CO1 | U | 5 |
| 22. | What is soil profile? Explain with suitable diagram. | | CO1 | An | 5 |
| 23. | Describe the methods to prevent soil pollution. | | CO4 | U | 5 |
| 24. | Describe biological classification of soil water. | | CO2 | A | 5 |
| 25. | Describe soil forming factors. | | CO1 | U | 5 |
| 26. | Explain the mechanism of soil aeration. | | CO2 | An | 5 |
| 27. | Explain the sources of charges on soil clays. | | CO3 | An | 5 |
| 28. | Describe the formation and classification of primary rocks. | | CO1 | U | 5 |
| 29. | Explain the Simonson’s fourfold soil forming processes | | CO1 | U | 5 |
| 30. | Give a detailed note on soil colour. | | CO2 | U | 5 |
| 31. | Explain different types of rocks and their formation. | | CO1 | An | 5 |
| 32. | Explain the sources of charges on clays. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe the behavior of organic and inorganic contaminants on soil pollution. | CO4 | A | 8 |
|  | b. | Explain the specific Pedogenic process in detail. | CO1 | A | 7 |
| 34. | a. | Give a detailed account on soil consistency. | CO2 | U | 8 |
|  | b. | Classify the silicate minerals and their properties. | CO3 | An | 7 |
| 35. | a. | Explain the classification and types of soil structure. | CO2 | U | 8 |
|  | b. | Explain the nature and properties of humic substances. | CO3 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Knowledge gained about the soil forming process. |
| CO2 | Physical properties of soil studied. |
| CO3 | Various soil chemical properties and reactions understood. |
| CO4 | Impact of soil pollution and remediation measures learnt. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 4 | 23 | 7 | 10 |  |  | 44 |
| CO2 | 4 | 27 | 5 | 5 |  |  | 41 |
| CO3 | 1 | 5 | 7 | 13 |  |  | 26 |
| CO4 | - | 6 | 8 | - |  |  | 14 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1007** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF ENTOMOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Generally, insects have \_\_\_\_\_\_\_\_ pairs of legs and \_\_\_\_\_\_\_\_ pairs of wings. | | CO1 | R | 1 |
| 2. | Respiratory pores present in the lateral side of insect’s body is \_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 3. | Asymmetrical mouthparts is present in \_\_\_\_\_\_\_\_. | | CO2 | A | 1 |
| 4. | Foragial hind legs are common in \_\_\_\_\_\_\_\_. | | CO3 | An | 1 |
| 5. | Plumose type of antenna is present in \_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 6. | The head of bugs is of \_\_\_\_\_\_\_\_ type. | | CO2 | R | 1 |
| 7. | Spider belongs to the phylum \_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 8. | Green lace wing fly lays \_\_\_\_\_\_\_\_ type of eggs. | | CO3 | R | 1 |
| 9. | The first Entomologist to the Government of India was \_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 10. | Insect haemolymph sugar is \_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 11. | What do you mean by mechanical control of pest management? | | CO6 | An | 1 |
| 12. | Meso and metathorax with wing are called as \_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 13. | Dragonflies and damselflies belong to \_\_\_\_\_\_\_\_ order. | | CO4 | A | 1 |
| 14. | Johnston’s organ is present in \_\_\_\_\_\_\_\_ segment of antenna. | | CO2 | R | 1 |
| 15. | Name one insect belongs to Diptera. | | CO4 | U | 1 |
| 16. | Cornicles are present in \_\_\_\_\_\_\_\_ insect. | | CO2 | R | 1 |
| 17. | Main organ of excretion and osmoregulation in insects is \_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 18. | Destructive Insects and Pests Act was enforced in the year \_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 19. | Coleoptera larva is knowns as \_\_\_\_\_\_\_\_. | | CO3 | A | 1 |
| 20. | Juvenile hormone is secreted by \_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write the morphological characters of class Insecta. | | CO4 | An | 5 |
| 22. | Differentiate between Apterigota and Pterigota. | | CO3 | E | 5 |
| 23. | Differentiate between endocrine and exocrine glands. | | CO3 | C | 5 |
| 24. | Differentiate Anisoptera and Zygoptera. | | CO4 | An | 5 |
| 25. | Differentiate among the different type of Head orientations in insects. | | CO3 | U | 5 |
| 26. | List out various types of insect legs with examples? Explain modifications present in honeybee. | | CO2 | R | 5 |
| 27. | Draw a labelled diagram of the Insect antenna and elucidate various types of antennae present in insects with examples. | | CO2 | R | 5 |
| 28. | Define metamorphosis. Describe different types of metamorphosis with suitable examples. | | CO3 | R | 5 |
| 29. | Differentiate between moths and butterflies. | | CO4 | U | 5 |
| 30. | Differentiate male and female reproductive systems of insects with neat diagrams. | | CO3 | An | 5 |
| 31. | Enlist the different types of mouthparts found in insects with examples. | | CO4 | An | 5 |
| 32. | Explain the wing coupling mechanism in insects. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss briefly on why insects are dominant in the Animal Kingdom. | CO1 | R | 7.5 |
|  | b. | Draw the structure of alimentary canal and explain its regions. | CO1 | U | 7.5 |
| 34. | a. | Name insect orders of agricultural importance. Describe the characteristics of Lepidoptera with features of important families and examples. | CO1 | U | 8 |
|  | b. | What are the general characters of Hymenoptera? Explain any four Hymenopteran families of agricultural importance with examples. | CO4 | R | 7 |
| 35. | a. | Explain cultural methods of pest control. Narrate its advantages and disadvantages. | CO6 | U | 7.5 |
|  | b. | Define IPM- Explain the components, scope and limitations of IPM. | CO6 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the origin and evolution of Insects. |
| CO2 | Understand the insect external body parts and their modifications. |
| CO3 | Understand the anatomy of internal organs and their functions. |
| CO4 | Remember the insect orders and families of agriculturally important pests. |
| CO5 | Analyze the factors influencing pest occurrence. |
| CO6 | Apply the fundamental knowledge on insects in their effective and integrated management strategies. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 9.5 | 7.5 | - | - | - | - | 17 |
| CO2 | 13 | 1 | 1 | - | - | - | 15 |
| CO3 | 9 | 19.5 | - | 6 | 5 | 5 | 44.5 |
| CO4 | 7.5 | 6 | 1 | 15 | - | - | 29.5 |
| CO5 | 1 | 1 | - | - | - | - | 2 |
| CO6 | 8.5 | 7.5 | - | 1 | - | - | 17 |
|  | | | | | | | **125** |



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| **Course Code:** | **20AG1008** | **Duration :** | **3hrs** |
| **Course Name:** | **AGRICULTURAL MICROBIOLOGY** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | | **CO/BL** | **Marks** | |
| **PART – A (20X1 = 20 MARKS)** | | | | | |
| 1. | Give an example for viral biopesticide. | | CO6 / R | 1 | |
| 2. | Tyndalization is a sterilization process carried out to kill \_\_\_\_\_\_\_\_\_\_\_\_\_producing microbes. | | CO2 / A | 1 | |
| 3. | Antibiotics are produced during \_\_\_\_\_\_\_\_\_\_\_\_\_ phase of growth cycle. | | CO2 / An | 1 | |
| 4. | Write an example for symbiotic nitrogen fixing microbe. | | CO6 / R | 1 | |
| 5. | The enzyme responsible for nitrogen fixation is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO6 / U | 1 | |
| 6. | What is plant incorporated proteins (PIPs)? | | CO5 / A | 1 | |
| 7. | Name the key enzyme involved in ligno-cellulosic biomass degradation. | | CO6 / E | 1 | |
| 8. | The surface of plant roots adhering to soil particles is called as \_\_\_\_\_\_\_\_\_. | | CO4 / U | 1 | |
| 9. | K solubilization is due to the production of \_\_\_\_\_\_\_\_\_\_ by soil microbes. | | CO4 / A | 1 | |
| 10. | The term ‘phyllosphere’ is coined by \_\_\_\_\_\_\_\_\_. | | CO4 / R | 1 | |
| 11. | What is the role of *lacZ* gene in regulation of lactose metabolism? | | CO5 / U | 1 | |
| 12. | The terminal electron acceptor of *Methanococous* is CH4. Identify the metabolic process. | | CO2 / C | 1 | |
| 13. | Who is the father of Medical Microbiology? | | CO1 / R | 1 | |
| 14. | Define cosmid? | | CO5 / An | 1 | |
| 15. | What are halophiles? | | CO 2 / U | 1 | |
| 16. | Pasteurization is carried out at a temperature of \_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 / R | 1 | |
| 17. | Give an example for entomopathogenic fungi. | | CO 6 / R | 1 | |
| 18. | Electron microscope is used to characterize small entities like \_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 / A | 1 | |
| 19. | What is *nod factor’* in legume-rhizobium symbiosis. | | CO 4 / U | 1 | |
| 20. | The *cry* protein expressed in Bt brinjal is \_\_\_\_\_\_\_\_\_\_\_. | | CO6 / A | 1 | |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | | Briefly explain sulphur cycle and substantiate its role in soil fertility. | CO4 / A | | 5 |
| 22. | | What are fungal biopesticides? Elucidate their mode of action with suitable examples | CO6 / U | | 5 |
| 23. | | Give any one contribution of the following scientists: a) Winogradsky; b) Louis Pasteur; c) Watson and Crick ; d) John Tyndall; e) Jacob and Monod | CO 1/ R | | 5 |
| 24. | | Define horizontal gene transfer. Explain the steps involved in HGF with a neat diagram. | CO5 / C | | 5 |
| 25. | | Explain the different types of sterilization methods with examples. | CO2 /E | | 5 |
| 26. | | Differentiate between archaebacteria and eubacteria. | CO2/ An | | 5 |
| 27. | | Define and give examples.  a) Chemo-phototrophs b) Chemo-organotrophs | CO3/ A | | 5 |
| 28. | | Classify microbes based on temperature requirement with suitable examples. | CO2 / E | | 5 |
| 29. | | Differentiate between lytic and lysogenic cycle. | CO5/ An | | 5 |
| 30. | | Explain the metabolic pathway for alcohol synthesis in *Zymomonas mobilis*. | CO2/ C | | 5 |
| 31. | | Narrate the steps involved in EMP pathway with the enzymes involved using a neat sketch. | CO2 / R | | 5 |
| 32. | | What is silage? Brief the significance of silage making. | CO6 /A | | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | What is semi-conservative mode of DNA replication? Explain it with a neat sketch. Mention the key enzymes involved in DNA replication. | CO5 / U | 10 |
| b. | Define transformation. Explain Griffith’s experiment to prove transformation with a neat sketch. | CO 5/ R | 5 |
|  |  |  |  |  |
| 34. | a. | Explain biological nitrogen fixation and substantiate its significance in maintaining soil fertility. | CO4 / U | 10 |
| b. | Give a brief account on the role of AM fungi in improving crop productivity | CO4 / A | 5 |
|  |  |  |  |  |
| 35. | a. | Explain the role of phyllosphere microbes in plant health. | CO4/ U | 7 |
| b. | How do you purify bacterial and fungal cultures isolated from soil? Elaborate the methods with neat sketches. | CO3 / C | 8 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Comprehend the importance and role of microbes in agricultural production. |
| CO2 | Understand principles of microscopy, sterilization techniques and nutrient media preparation. |
| CO3 | Enumerate microbial load in soil and perform isolation, culturing and purification of microbes. |
| CO4 | Describe role of microbes in enhancing soil fertility. |
| CO5 | Analyze genetic improvement of crop plants and transformation methods using microbes. |
| CO6 | Apply knowledge and develop biofertilizers, biopesticides, biofuels, and bio-waste degradation. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 7 | - | - | - | - | - | 7 |
| CO2 | 5 | 1 | 2 | 6 | 10 | 6 | 30 |
| CO3 | - | - | 13 | - | - | - | 13 |
| CO4 | 1 | 19 | 11 | - | - | - | 31 |
| CO5 | 5 | 11 | 1 | 6 | - | 5 | 28 |
| CO6 | 3 | 6 | 6 | - | 1 | - | 16 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1010** | **Duration** | **3hrs** |
| **Course Name** | **HUMAN VALUES AND ETHICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | | |
| 1. | ----------------------- is the foundation of critical thinking. | | | CO1 | R | | 1 |
| 2. | What does ‘SMART’ denotes in goal setting? | | | CO1 | U | | 1 |
| 3. | Who gave the famous quote “If character is lost, everything is lost”? | | | CO1 | R | | 1 |
| 4. | The ability to see yourself clearly and objectively through reflection and introspection is called as ----------------------. | | | CO2 | R | | 1 |
| 5. | Purpose is a sense of knowing that your life has meaning, value, and importance. (True/False). | | | CO2 | U | | 1 |
| 6. | --------------- inspires positive thinking and hope. | | | CO2 | R | | 1 |
| 7. | You can objectively evaluate yourself, manage your emotions, align your behavior with your values, and understand correctly how others perceive you, if you are ………………. | | | CO3 | U | | 1 |
| 8. | The most important step in self-exploration is ------------------. | | | CO3 | R | | 1 |
| 9. | Sending a thank note is one of the way to express ……………….. | | | CO3 | U | | 1 |
| 10. | Bad decisions are effective and ethical. (True/False). | | | CO4 | U | | 1 |
| 11. | An emotional state of satisfaction that can be seen as a mental state is ……………….. | | | CO4 | U | | 1 |
| 12. | The key component of emotional intelligence is ……………. | | | CO4 | R | | 1 |
| 13. | Personal goals can provide short-term ……………. | | | CO5 | R | | 1 |
| 14. | The ability to think positive is termed as …………….. | | | CO5 | R | | 1 |
| 15. | A person with fixed mindset believe that talent is ingrained and that we cannot change our ability level. (True/False). | | | CO5 | U | | 1 |
| 16. | Which attitude helps people to serve for marginalized people and needy. | | | CO6 | U | | 1 |
| 17. | Selfless service always eliminate ego. (True/False). | | | CO6 | U | | 1 |
| 18. | Define value. | | | CO1 | R | | 1 |
| 19. | Expand SWOT. | | | CO3 | R | | 1 |
| 20. | What is reasoning? | | | CO4 | U | | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | | |
| 21. | Relate morality and ethics. | | | CO1 | | An | 5 |
| 22. | Define goals. Briefly elaborate the types of goals. | | | CO2 | | U | 5 |
| 23. | Differentiate real purpose and impaired purpose. | | | CO3 | | An | 5 |
| 24. | Discuss on the factors leading to poor decision making? | | | CO4 | | U | 5 |
| 25. | How do you related negative self-talk and positive thinking? | | | CO5 | | An | 5 |
| 26. | In daily life how do you care for your soul? | | | CO5 | | A | 5 |
| 27. | Define natural acceptance? Enlist the characteristics of natural acceptance. | | | CO3 | | U | 5 |
| 28. | Explore the ways to achieve self-satisfaction. | | | CO2 | | U | 5 |
| 29. | What are the characteristics of a highly sensitive person (HSP)? | | | CO5 | | An | 5 |
| 30. | Practice of non-attachment is the road to freedom. Substantiate the statement. | | | CO4 | | U | 5 |
| 31. | Differentiate IQ, SQ and EQ. | | | CO6 | | An | 5 |
| 32. | What is resilience? Explain the four key features of a resilient personality. | | | CO6 | | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | | |
| 33. | | a. | Explain the importance of value-based living with suitable examples. | CO1 | | U | 8 |
|  | | b. | Explain the key elements involved in motivation with an illustration. | CO2 | | E | 7 |
| 34. | | a. | Give details on the seven step paths for making ethical decisions when you face difficult choice? | CO3 | | A | 8 |
|  | | b. | What is emotional detachment and why do you need it. | CO4 | | U | 7 |
| 35. | | a. | Why do we resist setting goals? Explain the reasons. | CO5 | | A | 8 |
|  | | b. | Elucidate the qualities for practicing selfless service. | CO6 | | E | 7 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the importance of value based living. |
| CO2 | Gain deeper understanding about the purpose of their life. |
| CO3 | Become value based professionals. |
| CO4 | Lead a balanced life with emotional stability. |
| CO5 | Set realistic goals in life and start working towards them. |
| CO6 | Become leaders with social concern. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 3 | 9 | - | 5 | - | - | 17 |
| CO2 | 2 | 11 | - | - | 7 | - | 20 |
| CO3 | 2 | 7 | 8 | 5 | - | - | 22 |
| CO4 | 1 | 20 | - | - | - | - | 21 |
| CO5 | 2 | 3 | 13 | 10 | - | - | 28 |
| CO6 | - | 5 | - | 5 | 7 | - | 17 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1010** | **Duration** | **3hrs** |
| **Course Name** | **HUMAN VALUES AND ETHICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Relate values and ethics. | | CO1 | An | 1 |
| 2. | What is your most cherished value? | | CO1 | U | 1 |
| 3. | ………..………………is the foundation of critical thinking. | | CO1 | R | 1 |
| 4. | Why is self-aware important? | | CO2 | A | 1 |
| 5. | How to turn a problem into an opportunity? | | CO6 | U | 1 |
| 6. | What does perseverance mean? | | CO3 | U | 1 |
| 7. | Why empathy is better than sympathy? | | CO3 | U | 1 |
| 8. | What is the most important part of SMART goal setting? | | CO5 | An | 1 |
| 9. | SWOT stands for………………………… | | CO2 | R | 1 |
| 10. | Define self-exploration. | | CO1 | E | 1 |
| 11. | Name the four temperaments described in individuals. | | CO3 | U | 1 |
| 12. | Who is a selfless person? | | CO4 | U | 1 |
| 13. | Unconditional acceptance of self, other, nature and existence is called as ………………………………. | | CO1 | R | 1 |
| 14. | What are the positive benefits of gratitude? | | CO1 | U | 1 |
| 15. | Relate intrinsic and extrinsic motivators. | | CO6 | U | 1 |
| 16. | Good decisions are both …………….and ……………… | | CO5 | E | 1 |
| 17. | Define temperament analysis. | | CO3 | R | 1 |
| 18. | …………………….is the state of being happy and satisfied. | | CO4 | U | 1 |
| 19. | “Know thyself “is a phrase given by the philosopher ……….. | | CO1 | R | 1 |
| 20. | What are professional skills? | | CO5 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the importance, benefits and value of goal setting. | | CO1 | C | 5 |
| 22. | How do you develop a spiritual quotient? Explain the ways to improve your spiritual wellness. | | CO3 | E | 5 |
| 23. | Examine the key benefits leaders derive from good decision making skills. | | CO6 | An | 5 |
| 24. | Compare and contrast the imposed and real purpose in life. | | CO2 | U | 5 |
| 25. | Illustrate the benefits of self-awareness. | | CO3 | U | 5 |
| 26. | Identify the reasons why people avoid setting goals for themselves. | | CO5 | A | 5 |
| 27. | Explain the principles of purpose based life. | | CO2 | E | 5 |
| 28. | Discover the benefits of contentment. | | CO4 | A | 5 |
| 29. | Distinguish fixed and growth mindset. | | CO5 | An | 5 |
| 30. | What are leadership skills? Choose five leadership skills that make a good leader. | | CO6 | C | 5 |
| 31. | Explain the strength and weakness of a sanguine character. | | CO3 | U | 5 |
| 32. | Conclude the factors that lead to poor decision making. | | CO2 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discover few things to help revive and nourish your body and soul. | CO3 | An | 7.5 |
|  | b. | Summarize the role of values in human life and society. | CO1 | U | 7.5 |
| 34. | a. | Explain the importance of having a positive mental attitude in life. | CO4 | E | 7.5 |
|  | b. | Elaborate the strategies to develop a positive spirit within yourselves. | CO4 | C | 7.5 |
| 35. | a. | Analyze the significant values to be gained from practical goal setting. | CO5 | An | 7.5 |
|  | b. | Formulate the steps to cultivate or enhance self-awareness in your life. | CO2 | C | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the importance of value based living. |
| CO2 | Gain deeper understanding about the purpose of their life. |
| CO3 | Become value based professionals. |
| CO4 | Lead a balanced life with emotional stability. |
| CO5 | Set realistic goals in life and start working towards them. |
| CO6 | Become leaders with social concern. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 9.5 |  | 1 | 1 | 5 | 19.5 |
| CO2 | 1 | 5 | 1 | 5 | 5 | 7.5 | 24.5 |
| CO3 | 1 | 13 |  | 7.5 | 5 |  | 26.5 |
| CO4 |  | 2 | 5 |  | 7.5 | 7.5 | 22.0 |
| CO5 |  |  | 11 | 8.5 | 1 |  | 20.5 |
| CO6 |  | 2 |  | 5 |  | 5 | 12.0 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG2003** | **Duration** | **3hrs** |
| **Course Name** | **ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS COMMUNICATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | List out the characteristics of Entrepreneurs. | | CO1 | R | 1 |
| 2. | What are the types of Entrepreneurs? | | CO1 | R | 1 |
| 3. | What do you meant by Achievement Motivation? | | CO1 | R | 1 |
| 4. | Write the full form of NBFC. | | CO4 | R | 1 |
| 5. | What is DIC? | | CO3 | R | 1 |
| 6. | What is Evaluation? | | CO2 | R | 1 |
| 7. | What is Industrial Development of bank of India? | | CO4 | R | 1 |
| 8. | The word “Entrepreneur” is derived from the ………………word. | | CO1 | R | 1 |
| 9. | Name any one Entrepreneurship Development Institute. | | CO4 | R | 1 |
| 10. | What is “Bootstrapping? | | CO4 | R | 1 |
| 11. | Intrinsic vs Extrinsic motivation- Comment. | | CO3 | R | 1 |
| 12. | Name the type of entrepreneur who is timid and cautious. | | CO3 | R | 1 |
| 13. | What is Seed Capital? | | CO3 | R | 1 |
| 14. | Name an industry for which Industrial Licensing was not relaxed in New Economic Policy in 1991. | | CO6 | R | 1 |
| 15. | What is defined as “the desire to achieve a goal or a certain performance level, leading to goal-directed behavior”? | | CO6 | R | 1 |
| 16. | Expand NIESBUD. | | CO1 | R | 1 |
| 17. | Write the full form of MFIs. | | CO6 | U | 1 |
| 18. | What is Fiscal Policy? | | CO1 | U | 1 |
| 19. | What is Monitoring? | | CO2 | U | 1 |
| 20. | Write the full form of TQM. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What is the difference between NBFCs and MFIs? | | CO1 | Cr | 5 |
| 22. | Discuss on “Make in India” initiative in our country. | | CO1 | U | 5 |
| 23. | What are the Leadership Skills expected of an entrepreneur? Write brief note on each of them. | | CO4 | R | 5 |
| 24. | What is Supply chain management and the need for supply chain management? | | CO2 | Cr | 5 |
| 25. | Write short notes on “Mudra” Loan Scheme. | | CO3 | U | 5 |
| 26. | Explain about any five ways in which you can finance your enterprise. | | CO3 | R | 5 |
| 27. | Explain the need and scope of Agripreneurship. Elaborate the broad business activities that are covered under Agripreneurship. | | CO6 | R | 5 |
| 28. | Distinguish between an entrepreneur and a business man. | | CO1 | U | 5 |
| 29. | What is the difference between quality and total quality management? | | CO6 | R | 5 |
| 30. | What are the scope and importance of Agricultural Supply Chain? | | CO5 | U | 5 |
| 31. | Write about POSDCoRB. | | CO4 | E | 5 |
| 32. | Explain various types of entrepreneurs based on the classification by Clarence Danhof, Arthur H. Cole, Ownership and Scale of enterprise. | | CO1 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Elaborate different components of a Project Report. | CO1 | Cr | 8 |
|  | b. | Write an essay on Project Planning. | CO4 | U | 7 |
| 34. | a. | Discuss with illustration ( diagram) Cyclic view, Push and Pull view of the process of Supply chain management . | CO2 | U | 8 |
|  | b. | Explain about the TQM process in small enterprises. | CO5 | A | 7 |
| 35. | a. | Identify and explain organizational Skills expected of an entrepreneur. | CO3 | U | 8 |
|  | b. | Explain basic Managerial Skills of an enterprise. | C06 | Cr | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Distinguish different entrepreneurial traits and skills. |
| CO2 | Know the agribusiness opportunities open for agriculture graduates |
| CO3 | Apply the leadership skills to get financial support for start-ups |
| CO4 | Understand the impact of economic reforms in agri-business |
| CO5 | Perform SWOT analysis of an entity for any prospective agribusiness/ideas |
| CO6 | Formulate business proposal for successful implementation of the business plan |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 11 |  | 5 |  | 13 | 34 |
| CO2 | 1 | 10 |  |  |  | 5 | 16 |
| CO3 | 9 | 13 |  |  |  |  | 22 |
| CO4 | 9 | 7 |  |  | 5 |  | 21 |
| CO5 |  | 5 | 7 |  |  |  | 12 |
| CO6 | 12 | 1 |  |  |  | 7 | 20 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG2007** | **Duration** | **3hrs** |
| **Course Name** | **GEOINFORMATICS AND NANOTECHNOLOGY AND PRECISION FARMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | \_\_\_\_\_\_\_\_\_\_ is a modern farming management concept using digital techniques to monitor and optimize agricultural production processes. | | CO1 | U | 1 |
| 2. | It is a set of 24 satellites in the Earth orbit. It sends out radio signals that can be processed by a ground receiver to determine the geographic position on earth. What is it? | | CO3 | R | 1 |
| 3. | \_\_\_\_\_\_\_\_ is an approach which aims at operating heavy farm machineries in fixed lanes to avoid unnecessary crop damage and soil compaction, and also to reduce the cost of operating heavy farm machineries. | | CO1 | U | 1 |
| 4. | "Site Specific Crop Management is also called as Precision Farming". Is this statement correct? | | CO1 | An | 1 |
| 5. | \_\_\_\_\_\_\_\_\_\_\_ is a device that detects and responds to some type of input (light, heat, motion, moisture, pressure etc) from the physical environment. | | CO3 | A | 1 |
| 6. | "The Global Positioning System (GPS), was originally called as NAVSTAR GPS". Is this true or false? | | CO1 | R | 1 |
| 7. | This type of sensor help in gathering chemical data of the soils by detecting specific ions in the soil. This sensor provides information in the form of pH and soil nutrient levels. What is the name of this sensor? | | CO3 | E | 1 |
| 8. | The amount of weight an Unmanned Aerial Vehicle (UAV) can carry is termed as \_\_\_\_\_\_\_ capacity. | | CO2 | R | 1 |
| 9. | \_\_\_\_\_\_\_\_\_ is a global navigation satellite system owned and operated by the Russia with 24+ satellites. | | CO3 | R | 1 |
| 10. | \_\_\_\_\_\_\_\_\_\_ is an aircraft without a human pilot on board. | | CO2 | A | 1 |
| 11. | \_\_\_\_\_\_\_\_\_is a general term describing any satellite constellation that provides positioning, navigation, and timing (PNT) services on a global or regional basis. | | CO3 | R | 1 |
| 12. | UAV with four rotors or propellers is called as \_\_\_\_\_\_\_\_\_\_\_ | | CO2 | R | 1 |
| 13. | Drones of weight from 2kg to 25kg has been categorized as \_\_\_\_\_\_\_\_ drones. | | CO2 | U | 1 |
| 14. | The abbreviation for DGCA is \_\_\_\_\_\_\_\_\_\_ | | CO2 | R | 1 |
| 15. | \_\_\_\_\_\_\_\_\_\_ is the art, science or technology dealing with the acquisition, storage, processing production, presentation and dissemination of geo-information. | | CO3 | A | 1 |
| 16. | \_\_\_\_\_\_\_\_\_ is the science of accurately measuring and understanding the three fundamental properties of earth: its geometric shape, its orientation in space, and its gravity field, as well as the changes of these properties with time. | | CO3 | A | 1 |
| 17. | Remote sensing techniques make use of the properties of \_\_\_\_\_\_\_\_\_\_\_ waves emitted, reflected or diffracted by the sensed objects. | | CO3 | R | 1 |
| 18. | The remote sensing system that depends on solar energy radiation for sensing the targets is known as \_\_\_\_\_\_\_\_ sensors | | CO3 | U | 1 |
| 19. | What is the abbreviation for DSSAT? | | CO4 | R | 1 |
| 20. | \_\_\_\_\_\_\_\_\_ is the term given to those areas of science and engineering where phenomena that take place at dimensions in the nanometre scale are utilised in the design, characterisation, production and application of materials, structures, devices and systems. | | CO6 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | List down any five objectives of Precision Farming. | | CO1 | R | 5 |
| 22. | Write a brief note on Variable Rate Technology (VRT). | | CO1 | U | 5 |
| 23. | What is meant by Grid Sampling? | | CO1 | R | 5 |
| 24. | What are the advantages of rotor type UAVs over fixed wing UAVs? | | CO2 | A | 5 |
| 25. | Write a note on the regulations on pesticide application for crop protection by using drones. | | CO2 | R | 5 |
| 26. | Write a brief note on Geodesy. | | CO3 | A | 5 |
| 27 | What is Photogrammetry and write a brief note about it? | | CO3 | U | 5 |
| 28 | List down the general applications of geoinformatics. | | CO3 | R | 5 |
| 29 | What are the advantages of remote-sensing technology over the traditional methods in agricultural resources survey? | | CO3 | A | 5 |
| 30 | List down the limitations of crop modeling. | | CO4 | An | 5 |
| 31. | What are the uses of GPS in Modern Agricultural Farming? | | CO1 | R | 5 |
| 32. | What are the challenges in using agricultural drones in India? | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Narrate the history, and the need for precision agriculture. | CO1 | U | 7.5 |
|  | b. | List the different types of Agriculture Sensors and briefly describe about it. | CO3 | R | 7.5 |
| 34. | a. | Write an essay on the uses of sensors in precision agriculture | CO3 | R | 7.5 |
|  | b. | Elaborate the application of remote sensing in agriculture. | CO3 | A | 7.5 |
| 35 | a | What is a leaf colour chart? How leaf color chart is used for effective N management in rice crop cultivation? List few demerits of LCC as well? | CO5 | A | 7.5 |
|  | b | Write a brief note on the following   1. Nanoparticles in Insect pest management (Nanoinsecticides) 2. Nanofungicides 3. Nanosensor | CO6 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the concepts of precision farming. |
| CO2 | Demonstrate the use of Unmanned Aerial Vehicle (UAV) in farm operations. |
| CO3 | Enhance their understanding on Geoinformatic principles and the use of GIS, GPS, Sensors and Remote Sensing technologies in agriculture. |
| CO4 | Relate the use of various Crop Simulation Models in crop production. |
| CO5 | Apply the STCR approach for optimizing the fertilizer inputs in precision farming. |
| CO6 | Acquire knowledge on nanotechnology and its uses for scaling-up farm productivity. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 16 | 14.5 |  | 1 |  |  | 31.5 |
| CO2 | 8 | 6 | 6 |  |  |  | 20 |
| CO3 | 24 | 6 | 20.5 |  | 1 |  | 51.5 |
| CO4 | 1 |  |  | 5 |  |  | 6 |
| CO5 |  |  | 7.5 |  |  |  | 7.5 |
| CO6 | 7.5 |  | 1 |  |  |  | 8.5 |
|  | | | | | | | **125** |



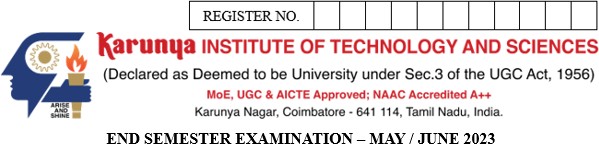
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| --- | --- | --- | --- |
| **Course Code** | **20AG2008** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF PLANT BREEDING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | A selection method used for asexually propagated crops. | | CO3 | U | 1 |
| 2. | The concept of pure line was given by----------. | | CO3 | R | 1 |
| 3. | What is emasculation and hybridization? | | CO1 | U | 1 |
| 4. | Define introduction and domestication. | | CO1 | R | 1 |
| 5. | The concept of centres of origin was proposed by……….. | | CO2 | R | 1 |
| 6. | F2 is a segregating population- True or False? | | CO3 | A | 1 |
| 7. | Define heterosis. | | CO4 | R | 1 |
| 8. | Name a breeding method used for handling segregating populations. | | CO3 | U | 1 |
| 9. | What is cleistogamy? | | CO1 | R | 1 |
| 10. | What is meant by primary introduction? | | CO2 | R | 1 |
| 11. | ----------- is the condition in which a single gene controls more than one phenotypic effect. | | CO1 | U | 1 |
| 12. | Expand CGMS. | | CO1 | R | 1 |
| 13. | Give the full form of IPR. | | CO5 | U | 1 |
| 14. | The first cotton hybrid is \_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
| 15. | What is plant breeders’ rights? | | CO6 | R | 1 |
| 16. | Loss of genetic diversity between and within populations of the same species over time is called ---------. | | CO2 | U | 1 |
| 17. | Examples of wheat dwarfing genes are -----------. | | CO3 | R | 1 |
| 18. | What is aneuploidy? | | CO1 | R | 1 |
| 19. | Give an example of barrier to distant or wide hybridization. | | CO1 | U | 1 |
| 20. | What is synthetic variety? | | CO3 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain cytoplasmic genetic male sterility with suitable diagrams. | | CO1 | U | 5 |
| 22. | Describe pure line and mass selection for crop improvement. | | CO3 | R | 5 |
| 23. | Differentiate purelines and multilines. | | CO3 | R | 5 |
| 24. | What is heterosis? What is inbreeding depression, give examples? | | CO3 | R | 5 |
| 25. | What are plant breeders’ rights and farmers’ rights? Discuss. | | CO6 | U | 5 |
| 26. | What are centers of origin? Describe the different types of centers of origin. | | CO2 | R | 5 |
| 27. | Define apomixis and explain the various types occurring in plants. | | CO1 | R | 5 |
| 28. | What is pedigree method and how a pedigree record is maintained? | | CO3 | U | 5 |
| 29. | How is male sterility useful in plant breeding and elaborate on its applications? | | CO1 | A | 5 |
| 30. | Differentiate inbreds and hybrids. Explain development of hybrids with host plant resistance. | | CO4 | U | 5 |
| 31. | List out the physical and chemical mutagens with examples. | | CO3 | R | 5 |
| 32. | Discuss the role of plant breeding and various objectives for which plant breeding is done. | | CO1 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain backcross breeding method with suitable flow charts. | CO3 | R | 8 |
|  | b. | List various breeding methods used in crop improvement with a brief explanation. | CO3 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | What is male sterility? Explain different types of male sterility. | CO1 | U | 8 |
|  | b. | Define mutation and elaborate on mutation breeding with examples. | CO3 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Elaborate on the classification of self-incompatibility in crop plants with suitable diagrams. | CO1 | R | 7 |
|  | b. | What are the methods to overcome self-incompatibility in crops? | CO1 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the basic concepts of plant breeding and genetics. |
| CO2 | Remember Origin and diversity of different crops, components of inheritance and variations. |
| CO3 | Apply the knowledge to develop high yielding crops with better quality. |
| CO4 | Produce varieties and hybrids with Host Plant resistance. |
| CO5 | Apply the protocols of Intellectual Property Rights and Patenting practically. |
| CO6 | Analyze Plant Breeders and Farmer’s Rights for research and commercial seed. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 16 | 29 | 5 | - | - | - | 50 |
| CO2 | 7 | 1 | - | - | - | - | 8 |
| CO3 | 31 | 22 | 1 | - | - | - | 54 |
| CO4 | 1 | 5 | - | - | - | - | 6 |
| CO5 | - | 1 | - | - | - | - | 1 |
| CO6 | 1 | 5 | - | - | - | - | 6 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG2010** | **Duration** | **3hrs** |
| **Course Name** | **PRODUCTION TECHNOLOGY FOR ORNAMENTAL**  **CROPS, MAP AND LANDSCAPING** | **Max. Marks** | **100** |

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| **Q.**  **No.** | **Questions** | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | |
| 1. | Define floriculture. | CO5 | U | 1 |
| 2. | Give two examples of biennial ornamental crops. | CO2 | U | 1 |
| 3. | Bioactive compounds present in Ashwagandha. | CO2 | R | 1 |
| 4. | Acropetal flower opening is seen in flower crop. | CO5 | R | 1 |
| 5. | Mention the part used in Aloe or Ashwagandha. | CO5 | R | 1 |
| 6. | Mention the commercial propagation method in Carnation. | CO5 | R | 1 |
| 7. | Gladiolus belongs to the family. | CO5 | R | 1 |
| 8. | Bud capping is a special practice followed in flower crop. | CO5 | A | 1 |
| 9. | Write any two bioactive compounds present in Sarpagandha. | CO5 | An | 1 |
| 10. | Which type of Marigold will not produce seeds? | CO5 | A | 1 |
| 11. | What is the commercial method of propagation followed in Tuberose and Lilium? | CO5 | R | 1 |
| 12. | Write the harvesting index in standard Carnation. | CO5 | An | 1 |
| 13. | Bull head is a physiological disorder observed in which flower crop. | CO5 | R | 1 |
| 14. | Define Mobility and Rhythm. | CO2 | R | 1 |
| 15. | Write any two medicinal crops with their usage. | CO5 | An | 1 |
| 16. | Mention the flower crops used for colour extraction. | CO5 | R | 1 |
| 17. | Write the common name of any two shrubs used in landscaping. | CO2 | An | 1 |
| 18. | Mention any two special practices followed in Rose. | CO5 | R | 1 |
| 19. | Mention the major alkaloids present in Mint. | CO5 | R | 1 |
| 20. | Which are the commercial flowers of Tamil Nadu? | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | |
| 21. | Describe the production technology of Chrysanthemum. | CO1 | A | 5 |
| 22. | Give in detail on netting in Carnation. | CO5 | R | 5 |
| 23. | Describe the difference between sympodial and monopodial Orchids. | CO5 | A | 5 |

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| 24. | Write the key features of African and French Marigold. | | CO5 | R | 5 |
| 25. | Differentiate between formal and informal garden style. | | CO5 | An | 5 |
| 26. | Write the production technology of Periwinkle. | | CO5 | A | 5 |
| 27. | Write the classification of ornamental and landscaping plants give appropriate examples. | | CO2 | An | 5 |
| 28. | Write in detail on different types of mints. | | CO5 | A | 5 |
| 29. | Write the production technology of Ashwagandha. | | CO5 | A | 5 |
| 30. | Write any ten value added products of flower crops. | | CO6 | A | 5 |
| 31. | Write a short note on annuals, biennials and perennial flower crops with examples. | | CO5 | R | 5 |
| 32. | Write a short note on diseases of Rose, Gerbera, Carnation and Gladiolus  flowers. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Give in detail on scope and importance of ornamental crops. | CO1 | U | 7.5 |
|  | b. | Explain the production technology of Carnation. | CO5 | A | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Discuss the physiological disorders of Rose and their control measures. | CO5 | A | 7.5 |
|  | b. | Write on physiological disorders in Gebera. | CO5 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write a short note on any ten garden principles. | CO2 | A | 7.5 |
|  | b. | Write the production technology of Jasmine. | CO5 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Highlight the importance of flowers, ornamental crops, medicinal and aromatic plants and landscaping |
| CO2 | Apply principles of landscaping using trees, shrubs and climbers |
| CO3 | Design different styles of gardens |
| CO4 | Design different styles of gardens |
| CO5 | Give details on the cultivation practices of Ornamental crops, Medicinal and Aromatic plants (MAPs) |
| CO6 | Handle flower crop, harvesting and post-harvest operation and processing of MAPs |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 7.5 | 5 | - | - | - | 12.5 |
| CO2 | 2 | 1 | 7.5 | 6 | - | - | 16.5 |
| CO3 | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - |
| CO5 | 25 | 1 | 52 | 8 | - | - | 86 |
| CO6 | - | - | 10 | - | - | - | 10 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG2013** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF SEED TECHNOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | |
| 1. | Minimum physical purity required for cotton ------- | CO 6 | R | 1 |
| 2. | Minimum genetic purity required for foundation seed production \_\_\_\_\_ | CO 2 | U | 1 |
| 3. | --------- is a protective layer of a plumule | CO 1 | A | 1 |
| 4. | Minimum physical purity required for paddy ------- | CO2 | A | 1 |
| 5. | Tag color for breeder seed. | CO2 | R | 1 |
| 6. | If the sowing days differ more than 7 days, seed producer required a separate ---- | CO2 | U | 1 |
| 7. | Who is an incharge for quality control of breeder seed---- | CO2 | C | 1 |
| 8. | Which is a objectionable weed plant of sunflower -------- | CO1 | E | 1 |
| 9. | ---------- percentage of off types allowed in cotton kapas sorting | CO3 | An | 1 |
| 10. | Which section of seed act 1966 specify the central seed committee? | CO3 | R | 1 |
| 11. | Which section of seed act 1966 specify the central seed laboratory? | CO3 | U | 1 |
| 12. | Which section of seed act 1966 specify the seed certification agency. | CO3 | A | 1 |
| 13. | Physiological maturation symptom for maize---- | CO5 | C | 1 |
| 14. | \_\_\_\_\_\_ is an example for protogynous crop | CO2 | R | 1 |
| 15. | \_\_\_\_\_\_ is an example for protandrous crop | CO5 | U | 1 |
| 16. | -------- is an example for short lived crop during seed storage | CO5 | C | 1 |
| 17. | ------------ is an example for seed protectant chemical | CO5 | R | 1 |
| 18. | Indented cylinder separate seeds according to the seed --------- | CO6 | An | 1 |
| 19. | Specific gravity separator separate seeds according to the seed --------- | CO6 | R | 1 |
| 20. | Physiological maturation symptoms for red gram------- | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | |
| 21. | Write about the primary and secondary dormancy. | CO1 | U | 5 |
| 22. | Write about seed pelleting. | CO1 | R | 5 |
| 23. | Write about seed hardening & seed fortification. | CO2 | A | 5 |
| 24. | Write about the dormancy breaking seed treatments. | CO2 | R | 5 |
| 25. | Write about the Central Seed committee. | CO2 | R | 5 |
| 26. | Write about the seed certification agency. | CO2 | E | 5 |
| 27. | Write the sequence of seed processing. | CO4 | C | 5 |
| 28. | Write about the indented cylinder. | CO6 | An | 5 |
| 29. | Write about specific gravity separator. | CO5 | A | 5 |
| 30. | Mention the factors affecting seed marketing. | CO5 | E | 5 |
| 31. | Mention the various seed upgrading machines. | CO6 | E | 5 |
| 32. | Write about kapas sorting, cob sorting & ground nut pod verification. | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | Write about the grow out test. | CO 1 | U | 15 |
|  |  |  |  |  |
| 34. | Write about the synthetic seed technology. | CO2 | R | 15 |
|  |  |  |  |  |
| 35. | Write about the seed village concept. | CO6 | U | 15 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the importance of quality seed in agriculture production. |
| CO2 | Distinguish types of seeds and know seed certification process |
| CO3 | Apply seed production agronomic principles and quality assessment. |
| CO4 | Describe seed structure and morphology, physical characteristics of seed |
| CO5 | Conduct varietal identification, seed quality assessments tests and seed treatments |
| CO6 | Remember the concepts in seed storage and seed marketing |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 5 | 20 | 1 |  | 1 |  | 27 |
| CO2 | 27 | 2 | 6 |  | 5 | 1 | 41 |
| CO3 | 1 | 1 | 1 | 1 |  |  | 4 |
| CO4 |  |  |  |  |  | 5 | 5 |
| CO5 | 6 | 9 | 5 |  | 5 | 8 | 33 |
| CO6 | 5 |  |  | 5 | 5 |  | 15 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **20AG2014** | **Duration** | **3hrs** |
| **Course Name** | **MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Arnon and Stout’s Criteria of essentiality. | | CO2 | R | 1 |
| 2. | Identify the nutrient whose deficiency causes the following deficiency symptoms  a. Purplish discolouration of older leaves  b. Khaira disease in paddy | | CO2 | R | 1 |
| 3. | Name three biofertilizers used for fixing atmospheric nitrogen. | | CO1 | R | 1 |
| 4. | Identify the microorganisms involved in the process of nitrification in soil. | | CO2 | R | 1 |
| 5. | In which form is nitrogen taken up by the plants? | | CO5 | U | 1 |
| 6. | Define Liebig’s Law of Minimum. | | CO2 | R | 1 |
| 7. | Name the extractant used in the estimation of available P. | | CO4 | U | 1 |
| 8. | State the year in which the Fertilizer Control Act (F.C.O) was promulgated by the Government of India. | | CO1 | R | 1 |
| 9. | Differentiate between Complex fertilisers and Mixed fertilisers. | | CO1 | An | 1 |
| 10. | State the expansion of DRIS. | | CO4 | R | 1 |
| 11. | Infer the optimum C:N ratio for plant growth. | | CO2 | U | 1 |
| 12. | Define nano fertilizers. | | CO1 | R | 1 |
| 13. | Identify the deficient nutrient for the given symptoms  a. Blossom end rot in tomato  b. Chlorosis of older leaves | | CO2 | R | 1 |
| 14. | List out 3 nitrogen containing fertilizers with nutrient composition. | | CO1 | R | 1 |
| 15. | List out the forms of soil Nitrogen. | | CO2 | U | 1 |
| 16. | Identify the nutrient most associated with luxury consumption and dynamic equilibrium. | | CO2 | U | 1 |
| 17. | In soil analysis and correlation approach, the recommended dose of fertilizer can be increased or decreased by what percentage from the medium range? | | CO6 | U | 1 |
| 18. | List out three techniques to improve nitrogen use efficiency. | | CO3 | A | 1 |
| 19. | Quote the maximum permissible limit of biuret in urea. | | CO1 | R | 1 |
| 20. | List out the common methods of fertilizer application. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the functions and deficiency symptoms of primary nutrients in plants. | | CO5 | U | 5 |
| 22. | Discuss on the need, objectives and components of Integrated Nutrient Management. | | CO3 | An | 5 |
| 23. | Classify the phosphorus fertilizers based on its composition and properties. | | CO1 | An | 5 |
| 24. | Explain the transformations of Nitrogen in soil with a neat diagram. | | CO2 | An | 5 |
| 25. | Explain in detail the mechanisms of nutrient transport to plants. | | CO2 | U | 5 |
| 26. | Propose few techniques to enhance the nitrogen use efficiency. | | CO4 | U | 5 |
| 27. | Appraise the importance of organic manures in soil fertility management and explain the preparation of concentrated organic manures. | | CO1 | E | 5 |
| 28. | Discuss the importance and advantages of nano fertilizers. | | CO1 | U | 5 |
| 29. | Write short notes on mixed fertilizers and the points to be considered during its preparation. | | CO1 | C | 5 |
| 30. | Explain in brief the chemistry of soil potassium. | | CO2 | U | 5 |
| 31. | Write short notes on the application of advanced techniques in plant nutrient management. | | CO6 | A | 5 |
| 32. | Discuss in brief about fertilizer storage and Fertilizer Control Order. | | CO1 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write an essay on the various fertilizer recommendation approaches in India. | CO6 | C | 7 |
|  | b. | Discuss in detail the functions and deficiency symptoms of secondary and micronutrients. | CO5 | U | 8 |
| 34. | a. | Compile the various means through which nutrients are lost from the soil. | CO2 | C | 7 |
|  | b. | Explain the phosphorus cycle and P fixation in soils. | CO2 | U | 8 |
| 35. | a. | Explain the methods of fertilizer application under rainfed and irrigated conditions | CO3 | U | 7 |
|  | b. | Explain the different methods of soil fertility evaluation. | CO4 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the properties of manures, fertilizers and soil amendments. |
| CO2 | Summarize the concepts of soil fertility and plant nutrition and chemistry of nutrients in soil. |
| CO3 | Demonstrate Integrated Nutrient Management and fertilizer recommendation practices. |
| CO4 | Evaluate the fertility of soil. |
| CO5 | Analyze the plant nutrient content. |
| CO6 | Recommend fertilizer dosage for different soil types. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 10 |  | 6 | 5 | 5 | 31 |
| CO2 | 5 | 21 |  | 5 |  | 7 | 38 |
| CO3 |  | 7 | 1 | 5 |  |  | 13 |
| CO4 | 1 | 14 |  |  |  |  | 15 |
| CO5 |  | 14 |  |  |  |  | 14 |
| CO6 | 1 | 1 | 5 |  |  | 7 | 14 |
|  | 12 | 67 | 6 | 16 | 5 | 19 | **125** |



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| **Course Code** | **20AG2015** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF PLANT PATHOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Sugarcane ratoon stunting is caused by \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 2. | Bacteria that contain one flagellum at one end is known as \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | The famous Irish famine of 1845-46 was caused due to the outbreak of \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 4. | *Khaira* disease of rice is due to the deficiency of \_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 5. | Example for internally seed-borne disease. | | CO2 | R | 1 |
| 6. | First plant bacterial disease fire blight of apple was caused by \_\_\_\_\_\_\_\_\_\_. | | CO2 | An | 1 |
| 7. | Cell wall of fungi is made up of \_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 8. | *Pythium aphanidermatum* is causing \_\_\_\_\_\_\_\_\_\_ disease on seedling of tomato. | | CO3 | U | 1 |
| 9. | Citrus canker is caused by \_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 10. | Tinsel and whiplash type of flagella produced by \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 11. | The number of ascospore produced in a typical asci are \_\_\_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 12. | Name the gelatinous disc produced by Albugo pathogen. | | CO2 | A | 1 |
| 13. | Example for total stem parasite is \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 14. | *Taphrina deformans* produces \_\_\_\_\_\_\_\_\_\_ type of asci | | CO3 | U | 1 |
| 15. | \_\_\_\_\_\_\_\_\_\_ is the resting spore produced by *Fusarium* sp. | | CO3 | A | 1 |
| 16. | Angular leaf spot of cotton is caused by \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 17. | The number of sporestages produced by *Puccinia graminis tritici* during its life cycle is \_\_\_\_\_\_\_\_\_\_. | | CO4 | E | 1 |
| 18. | Complex flask shaped asexual fruiting body is called as \_\_\_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 19. | Asexual spore of Oomycetes is \_\_\_\_\_\_\_\_\_\_. | | CO3 | U | 1 |
| 20. | Write an example for gram negative bacteria. | | CO3 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Recall the phanerogamic parasites with examples. | | CO6 | A | 5 |
| 22. | **Define the following terms:** i) Sign ii) Symptom iii) Thallus  iv) Inoculum potential v) Pathogen | | CO2 | R | 5 |
| 23. | **Give the term used for each of the following:**  (i) Minute, simple propagating unit of the fungi  ii) Scientific study of fungi is called as  iii) A disease usually occurs widely but periodically in a destructive form is called as  iv) An organism that lives on some other living organism (host) and derive nutrition is known as  v) Mass of hyphae is called as | | CO3 | U | 5 |
| 24. | Differentiate macrocyclic rust and microcyclic rust with a suitable example. | | CO3 | U | 5 |
| 25. | Briefly explain different types of asexual fruiting bodies in fungi with example. | | CO2 | An | 5 |
| 26. | Briefly explain different types of flagella in bacteria with suitable example. | | CO2 | A | 5 |
| 27. | Briefly explain reproduction in bacteria. | | CO3 | R | 5 |
| 28. | Write the causal organism of the following diseases  (i)Rice blast (ii) Wheat stem rust (iii) Pulses root rot (iv) Wilt of cotton (v) Red rot of sugarcane. | | CO2 | R | 5 |
| 29. | Briefly discuss any five types of symptoms produced by bacteria. | | CO4 | U | 5 |
| 30. | Differentiate prokaryotes and eukaryotes with examples. | | CO2 | E | 5 |
| 31. | Write the difference between alternate host and collateral host with a suitable example. | | CO5 | An | 5 |
| 32. | Write any five different symptoms produced by plant virus. | | CO4 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Summarize systematic position, symptom, general characters and life cycle of wheat stem rust. | CO4 | R | 8 |
|  | b. | Describe in detail about mode of dispersal of plant pathogens. | CO4 | U | 7 |
| 34. | a. | Summarize systematic position, symptom, general characters and life cycle of club root of cabbage. | CO2 | R | 8 |
|  | b. | List out different powdery mildew pathogens and their conidial arrangements with suitable diagrams. | CO3 | An | 7 |
| 35. | a. | Briefly write about sexual and asexual reproduction in fungi. | CO2/ | U | 8 |
|  | b. | Write in detail about any five historical events in plant pathology. | CO3 | C | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the factors responsible for disease development. |
| CO2 | Understand the importance of different plant pathogens with their characteristics and classification. |
| CO3 | Recall the reproduction, survival and transmission of plant pathogens. |
| CO4 | Outline the mode of dispersal, role of enzymes and toxins in disease development. |
| CO5 | Analyze defense mechanism in plants and the epidemiological factors. |
| CO6 | Apply knowledge on plant disease management. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | - | - | - | - | - | 2 |
| CO2 | 13 | 33 | - | 5 | - | - | 51 |
| CO3 | 3 | 28 | - | 10 | 5 | - | 46 |
| CO4 | 1 | 5 | - | - | - | - | 6 |
| CO5 | - | 1 | - | 5 | - | - | 6 |
| CO6 | 1 | 6 | - | 1 | - | 6 | 14 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **20AG2016** | **Duration** | **3hrs** |
| **Course Name** | **DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT-II** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write causal organism of Loose smut of wheat disease. | | CO3 | C | 1 |
| 2. | List out three types of rust disease in wheat. | | CO2 | R | 1 |
| 3. | The inner region of cane is reddish in colour with intermittent white tinges across the cane length of sugarcane is symptoms caused by \_\_\_\_\_\_\_\_. | | CO1 | An | 1 |
| 4. | List out any two fungal disease in sunflower. | | CO1 | R | 1 |
| 5. | Write causal organism of White blisters of mustard. | | CO3 | C | 1 |
| 6. | Write any two wilt diseases in cotton. | | CO2 | C | 1 |
| 7. | Which types of conidia produced by cotton Boll rot disease? | | CO3 | U | 1 |
| 8. | Write down five phases of symptoms produced by Bacterial blight disease of cotton. | | CO2 | C | 1 |
| 9. | Write causal organism of Powdery mildew disease of cucurbits. | | CO3 | C | 1 |
| 10. | Write the causal agent and vector of Red gram sterility mosaic disease. | | CO3 | A | 1 |
| 11. | Write the causal agent and vector of cowpea mosaic disease. | | CO3 | A | 1 |
| 12. | Write down any two management practices to control sooty mould disease of mango. | | CO4 | C | 1 |
| 13. | List out two stages of symptoms produced by mango malformation and its causal organism. | | CO2 | R | 1 |
| 14. | Infected shoots turn black and curl giving a 'Shepherd's Crook' appearance is symptoms of \_\_\_\_\_\_\_\_\_\_ of apple. | | CO2 | An | 1 |
| 15. | Cauliflower -like warty growth on tubers is symptoms produced by \_\_\_\_\_\_\_\_\_ in potato. | | CO2 | E | 1 |
| 16. | Red scale onion are resistant to \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | An | 1 |
| 17. | Fruit rot of chilli is caused by \_\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | An | 1 |
| 18. | Leaf Blotch of turmeric is caused by \_\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | E | 1 |
| 19. | Define muriform conidia with example. | | CO1 | E | 1 |
| 20. | Stem gall disease of coriander is caused by \_\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the internally seed borne fungal disease in wheat. | | CO3 | R | 5 |
| 22. | Write the symptoms, mode of spread and management of red rot of sugarcane. | | CO4 | C | 5 |
| 23. | Describe the symptoms and management of Bacterial Blight in cotton. | | CO5 | R | 5 |
| 24. | Illustrate the symptoms of early blight and late blight of potato. | | CO2 | An | 5 |
| 25. | List out the viral diseases in gram and explain about any two viral diseases. | | CO2 | R | 5 |
| 26. | Write the symptoms, mode of spread and management of Fusarium wilt and Verticillium wilt disease of cotton. | | CO4 | C | 5 |
| 27. | List out diseases of mango and explain about mango malformation. | | CO2 | R | 5 |
| 28. | Write the difference between Oidium, Oidiopsis and Ovulariopsis. | | CO5 | C | 5 |
| 29. | Illustrate Peach leaf curl and Onion blotch disease. | | CO2 | R | 5 |
| 30. | Write down the symptoms and management of Anthracnose disease in Grapes. | | CO4 | A | 5 |
| 31. | Sketch out the difference between three rust diseases of wheat. | | CO3 | A | 5 |
| 32. | Illustrate symptoms of Strawberry leaf spot disease. | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write down the different type of rust disease in wheat. | CO2 | C | 8 |
|  | b. | Write down the diseases of cotton and elaborate the bacterial & viral diseases. | CO6 | C | 7 |
|  |  |  |  |  |  |
| 34. | a. | List out the diseases of potato and elaborate the viral diseases. | CO6 | An | 8 |
|  | b. | Elaborately discuss about Canker, Greening and Tristeza disease in citrus. | CO4 | R | 7 |
|  |  |  |  |  |  |
| 35. | a. | Discuss any five important diseases in chilli and their management. | CO5 | R | 8 |
|  | b. | List out diseases in turmeric and explain it. | CO3 | An | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Recall various plant pathological terms and basic concepts of important plant diseases. |
| CO2 | Explain the disease symptoms of various plant diseases of field and horticultural crops. |
| CO3 | Interpret the host pathogen interaction on disease development in field and horticultural crops. |
| CO4 | Determine the prevalence, epidemiology and factors affecting disease development. |
| CO5 | Apply the concept of integrated management practices to control diseases of field and horticultural crops. |
| CO6 | Recommend management practices for diseases of different crop plants. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | - | - | 1 | 1 | - | 3 |
| CO2 | 22 | - | - | 6 | 1 | 10 | 39 |
| CO3 | 5 | 6 | 10 | 1 | 2 | 2 | 26 |
| CO4 | 7 | - | 5 | - | - | 11 | 23 |
| CO5 | 13 | - | - | 1 | - | 5 | 19 |
| CO6 | - | - | - | 8 | - | 7 | 15 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **20AG2017** | **Duration** | **3hrs** |
| **Course Name** | **POST-HARVEST MANAGEMENT AND VALUE ADDITION OF FRUITS AND VEGETABLES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | CFTRI is located at  A) Chennai B) New Delhi C) Mysore D) Pune | | CO1 | R | 1 |
| 2. | Sprouting of onion can be controlled by  A) Pre harvest spray of maleic hydrazide B) Hydrocooling  C) Pre harvest spray of Gibberellic acid D) Forced air cooling | | CO5 | U | 1 |
| 3. | Total post-harvest losses in fruits and vegetables  A) 42 - 100% B) 20 – 95 % C) 20 - 80% D) 20 – 30 % | | CO1 | An | 1 |
| 4. | Mineral nutrition that influences shelf life of fruits and vegetables  A) Calcium B) Chlorine C) Manganese D) Sulphur | | CO3 | R | 1 |
| 5. | Reducing the field heat of fruits immediately after harvest -------------  A) Withering B) Curing C) Precooling D) Drying | | CO2 | U | 1 |
| 6. | The major factor useful in controlling enzyme activity  A) Light B) Sugar C) Starch D) Temperature | | CO3 | R | 1 |
| 7. | Washing improves shelt life of……..  A) Mango B) Sapota C) Banana D) Citrus | | CO3 | R | 1 |
| 8. | Loss in moisture is ---------- type of post-harvest loss  A) Physiological B) Physical C) Spoilage D) Biological | | CO2 | A | 1 |
| 9. | In India , processing of fruits and vegetables accounts for---------of total  production  A) 78% B) 2.2% C) 23% D) 65% | | CO1 | An | 1 |
| 10. | Bitter pit in apple and cork spot in pear are caused due to  A) Calcium deficiency B) Boron deficiency  C) Zinc deficiency D) Nitrogen deficiency | | CO5 | U | 1 |
| 11. | Abbreviate FSSAI……….. | | CO6 | R | 1 |
| 12. | Relative humidity is measured by | | CO2 | R | 1 |
| 13. | Verification also includes………. process of finding evidence for the accuracy of the HACCP system | | CO6 | U | 1 |
| 14. | Penetrometer is used to measure…………… | | CO4 | R | 1 |
| 15. | The ideal temperature for ripening of banana…………. | | CO3 | An | 1 |
| 16. | Potatoes and apple when cut turn brown due to--------------------- | | CO5 | R | 1 |
| 17. | The Fruit Products Order act established on……….. | | CO6 | An | 1 |
| 18. | ---------- is a pre- treatment in drying | | CO3 | U | 1 |
| 19. | Water content in Vegetables ------------ | | CO3 | A | 1 |
| 20. | Codex Alimentarius means …………….in Latin. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss about advanced and modern storage of fruits and vegetables. | | CO3 | U | 5 |
| 22. | State about the genetic and climatic pre harvest factors that affect the post-harvest life of fruits and vegetables. | | CO1 | R | 5 |
| 23. | List out the problems caused in Jam production. | | CO4 | R | 5 |
| 24. | Interpret about microbial spoilage of canned foods. | | CO5 | A | 5 |
| 25. | Explain the importance of preservation. | | CO3 | U | 5 |
| 26. | Examine salient features of Codex Alimentarius. | | CO6 | An | 5 |
| 27. | List out the points to control the spoilage of Raw Foods. | | CO5 | R | 5 |
| 28. | Discuss the scope of post harvest management in India. | | CO1 | U | 5 |
| 29. | Sketch out the Flow- sheet for processing of marmalade. | | CO4 | A | 5 |
| 30. | Discuss the problems in preparation of preserves and candied fruits. | | CO4 | U | 5 |
| 31. | State the site of losses (secondary loss) in post-harvest losses in fruits and vegetables. | | CO2 | R | 5 |
| 32. | Discuss the functions of FSSAI. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the importance and role of post-harvest management of fruits and vegetables. | CO1 | U | 8 |
|  | b. | Explain the principle and process of canning. | CO5 | U | 7 |
| 34. | a. | Interpret the ingredients, methods, FPO specification of Jam and Jelly. | CO4 | A | 6 |
|  | b. | List out the factors responsible for post-harvest losses in fruits and vegetables. | CO2 | R | 9 |
| 35. | a. | Explain in brief about principles of food preservation by various methods. | CO3 | U | 10 |
|  | b. | Define HACCP with its principles. | CO6 | R | 5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the different post-harvest management of important fruits and vegetables. |
| CO2 | Understand the factors causing postharvest losses in fruits and Vegetables. |
| CO3 | Understand principles and methods of preserving fruits and vegetables. |
| CO4 | Explain about the different value addition process of important fruits and vegetables. |
| CO5 | Examine the process of food spoilage and quality control of processed food. |
| CO6 | Demonstrate knowledge about the different government schemes and laws in import and export. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 6 | 13 |  | 2 |  |  | 21 |
| CO2 | 15 | 1 | 1 |  |  |  | 17 |
| CO3 | 3 | 21 | 1 | 1 |  |  | 26 |
| CO4 | 6 | 5 | 11 |  |  |  | 22 |
| CO5 | 6 | 9 | 5 |  |  |  | 20 |
| CO6 | 7 | 6 |  | 6 |  |  | 19 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **20AT2006** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTORY SOIL AND WATER CONSERVATION ENGINEERING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention two major process during soil erosion. | | CO1 | U | 1 |
| 2. | What is slope and length factor? | | CO1 | U | 1 |
| 3. | Define stream bank erosion. | | CO2 | U | 1 |
| 4. | Define on gully erosion. | | CO2 | U | 1 |
| 5. | What do meant by sheet erosion? | | CO2 | U | 1 |
| 6. | Define erodibility. | | CO1 | U | 1 |
| 7. | Write shortly on Terminal velocity. | | CO3 | U | 1 |
| 8. | Name any one of the soil and water conservation institute. | | CO 3 | An | 1 |
| 9. | Define run-off. | | CO4 | An | 1 |
| 10. | Contour line with “V” shaped with convexity towards higher ground surface indicate \_\_\_\_\_\_\_\_\_\_. | | CO4 | U | 1 |
| 11. | Write on two our run-off measuring devices. | | CO4 | R | 1 |
| 12. | Mention on various methods of measuring soil erodibility. | | CO2 | U | 1 |
| 13. | What are the various shapes used in grassed waterway? | | CO4 | U | 1 |
| 14. | \_\_\_\_\_\_\_\_\_\_ soils are not suitable for bund construction. | | CO5 | U | 1 |
| 15. | What are the factors affecting wind erosion? | | CO5 | An | 1 |
| 16. | Define contour bund. | | CO6 | U | 1 |
| 17. | Define table top bench terrace. | | CO4 | U | 1 |
| 18. | Define shelterbelt. | | CO6 | U | 1 |
| 19. | What are factors affecting water erosion? | | CO2 | E | 1 |
| 20. | Define windbreak. | | CO6 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Enumerate the applications and limitations of USLE. | | CO 3 | U | 5 |
| 22. | Compare the mechanical measures and agronomic measures to control water erosion. | | CO1 | A | 5 |
| 23. | Explain the method of EI30 and KE>25 index of estimation of rainfall erosivity. | | CO2 | U | 5 |
| 24. | Explain in detail the classification of gullies. | | CO2 | An | 5 |
| 25. | Explain in details the land capability classification. | | CO 4 | U |  |
| 26. | Write in detail the types of water erosion. | | CO 5 | U | 5 |
| 27. | Explain in detail the types of water harvesting and their importance. | | CO 4 | U | 5 |
| 28. | Write short notes on methods of contouring. | | CO 4 | A | 5 |
| 29. | Differentiate between the contour bund and graded bund. | | CO5 | U | 5 |
| 30. | Write short notes on Modified Universal Soil Loss Equation. | | CO2 | E | 5 |
| 31. | Describe the mechanics of wind erosion. | | CO5 | U | 5 |
| 32. | Write on the various types of terracing. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain in detail (i) Specification of bund.  (ii) Construction of bund. | CO2 | A | 8 |
|  | b. | Discuss in detail the causes and factors affecting soil erosion. | CO1 | E | 7 |
| 34. | a. | Explain in detail the factors associated with Universal Soil Loss Equation. | CO3 | An | 8 |
|  | b. | Explain in detail the gully control measures and their classification. | CO | A | 7 |
| 35. | a. | Give account on the various water harvesting techniques. | CO | E | 8 |
|  | b. | Discuss in detail the designing of grassed waterways. | CO | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | The students will attain the basic concepts of soil and water conservation. |
| CO2 | To adopt the gully erosion control measures. |
| CO3 | To measure the soil loss using different techniques. |
| CO4 | Explain the water harvesting techniques. |
| CO5 | Understand the mechanics of wind erosion. |
| CO6 | Adapt the different control measures of wind erosion. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 1 | 2 | 5 | - | 7 | - | 15 |
| CO2 | - | 9 | 8 | 5 | 6 | - | 28 |
| CO3 | 1 | 6 | - | 8 | - | - | 15 |
| CO4 | 1 | 18 | 12 | 1 | - | - | 32 |
| CO5 | - | 16 | - | 1 | 8 | - | 25 |
| CO6 | - | 3 | 7 | - | - | - | 10 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG1001** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF AGRONOMY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Farmers generally use --------------------------- type of seeds. | | CO2 | R | 1 |
| 2. | Rotovator is a secondary -------------------- implement. | | CO2 | R | 1 |
| 3. | ------------- number of elements are identified as essential for plant growth. | | CO3 | U | 1 |
| 4. | The element which is a constituent of chlorophyll and gives good green colour to leaves is ----------------------- . | | CO2 | U | 1 |
| 5. | The act of raising quick growing crops preferably legumes and ploughing in situ and incorporated into the soil is called ---------------- manuring. | | CO2 | A | 1 |
| 6. | Diammonium phosphate ( 18-46-0) is a --------------- type of fertilizer. | | CO2 | An | 1 |
| 7. | ------------ bacteria live in the nodules of host plants belonging to the family Fabaceae and fix atmospheric nitrogen symbiotically. | | CO3 | An | 1 |
| 8. | A plant that is growing where it is not wanted is called -------------. | | CO4 | R | 1 |
| 9. | Among the annual agricultural loss in India,weeds account for ------%. | | CO4 | E | 1 |
| 10. | A herbicide when applied in a mixed growth of plant species, it kills unwanted plants without injuring the crop plants is known as ----------------- herbicide. | | CO4 | An | 1 |
| 11. | ---------- allelopathy is the release of substances that are toxic in the form in which they are produced in the plant. | | CO4 | U | 1 |
| 12. | Resistance of crop plants to climatic, edaphic and biological stresses is a ------------------- factor affecting plant growth. | | CO5 | E | 1 |
| 13. | -------------------- is the response of plants to the length of the day and night to induce flowering. | | CO5 | R | 1 |
| 14. | A crop ------------ is a plant model, which is expected to yield a greater quantity or quality of grain, oil or other useful product when developed as a cultivar. | | CO5 | E | 1 |
| 15. | Crop ------------- is the repetitive cultivation of an ordered succession of crops or crops and fallow on the same land. | | CO5 | U | 1 |
| 16. | Yearly sequence and spatial arrangement of crops or crops and fallow on a given area is known as cropping ----------------- . | | CO5 | C | 1 |
| 17. | The area around a dam which is under its command as an irrigation source is known as ------------------ area. | | CO5 | U | 1 |
| 18. | The ratio of the economic yield to the total biological yield expressed as percentage is known as ------------------- index. | | CO6 | C | 1 |
| 19. | Milling of parboiled paddy yields on an average ------------- % rice. | | CO6 | A | 1 |
| 20. | The idea behind -------------- support price is to give guaranteed price and assured market to the farmers and protect them from the price fluctuations and market imperfections. | | CO6 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate between shifting cultivation and subsistence farming. | | CO1 | An | 5 |
| 22. | Explain different types of seeds. | | CO2 | R | 5 |
| 23. | Explain catch crops and trap crops with examples. | | CO2 | C | 5 |
| 24. | Explain the functions and deficiency symptoms of Nitrogen in crop plants. | | CO3 | U | 5 |
| 25. | Classify phosphatic fertilizers. | | CO3 | An | 5 |
| 26. | Classify weeds according to their lifecycle with examples. | | CO4 | A | 5 |
| 27. | Write a short note on critical period of Weed Competition. What is the critical period of weed competition of upland and puddled rice from direct seeding? | | CO4 | E | 5 |
| 28. | Explain the characteristics of rainfall and their effect on plant growth. | | CO5 | A | 5 |
| 29. | Define crop ideotype. Explain the characteristics of an ideal rice ideotype. | | CO5 | U | 5 |
| 30. | What is the extent of food grain loss in India during storage. Explain the factors that affect storage of grains. | | CO6 | E | 5 |
| 31. | Write a short note on different methods of harvesting of cereals in India. | | CO6 | C | 5 |
| 32. | Define crop rotation. Explain the advantages of crop rotation. | | CO5 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Distinguish between green manuring and leaf manuring with suitable examples. List out the advantages of organic manures. | CO3 | A | 8 |
|  | b. | Define fertilizer or nutrient use efficiency with examples. Explain the factors affecting fertilizer or nutrient use efficiency. | CO3 | R | 7 |
| 34. | a. | Write about the cultural methods of weed control. | CO4 | C | 8 |
|  | b. | Explain selective, non-selective, contact and systemic herbicides with at least one example each. | CO4 | U | 7 |
| 35. | a. | Define multiple cropping. Briefly explain different forms of multiple cropping. | CO5 | E | 8 |
|  | b. | Write a short note on value added products of rice. | CO6 | An | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand branches of agriculture, evolution of scientific agriculture and agronomy. |
| CO2 | Seeds and sowing, crop geometry and plant density, crops and classification. |
| CO3 | Study and identify crops, seeds, fertilizers, manures, pesticides, farm /tillage implements. |
| CO4 | Acquire scientific knowledge on weeds, its impacts on crop growth, methods of weed management, ,herbicide action in plants, allelopathy. |
| CO5 | Study growth concepts, growth and yield analysis, factors affecting growth, plant ideotypes, crop rotation, major crops of India and cropping systems. |
| CO6 | Harvest and post- harvest technology of major crops, storage, marketing and support prices. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  |  |  | 5 |  |  | 5 |
| CO2 | 7 | 1 | 1 | 6 |  |  | 15 |
| CO3 | 7 | 6 | 8 | 6 |  |  | 27 |
| CO4 | 1 | 8 | 5 | 1 | 6 | 8 | 29 |
| CO5 | 6 | 7 | 5 | 5 | 12 | 1 | 36 |
| CO6 |  | 1 | 1 |  | 5 | 6 | 13 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG1002** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL HERITAGE** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Heritage. | | CO1 | R | 1 |
| 2. | Give one example of ITK. | | CO6 | R | 1 |
| 3. | Enlist the stages of stone age. | | CO1 | R | 1 |
| 4. | Number of Agro climatic zones in Tamil Nadu ----------. | | CO1 | R | 1 |
| 5. | Give an example for crop rotation. | | CO1 | U | 1 |
| 6. | Continuous record of past events is called as -----------------. | | CO1 | R | 1 |
| 7. | Headquarters of ICAR is situated at………………… | | CO3 | R | 1 |
| 8. | Blue revolution aimed to increase the production of …………. | | CO3 | R | 1 |
| 9. | Who is known as the father of Green revolution in India? | | CO3 | R | 1 |
| 10. | Expand NDRI. | | CO3 | R | 1 |
| 11. | Where is IRRI situated? | | CO3 | R | 1 |
| 12. | Number of Agro climatic zones in India according to planning commission. | | CO4 | R | 1 |
| 13. | Give two examples of cash crops. | | CO5 | U | 1 |
| 14. | Enlist the major crop seasons. | | CO5 | U | 1 |
| 15. | Sugarcane breeding institute is situated at …………. | | CO2 | U | 1 |
| 16. | Give an example each for short and long duration crops. | | CO2 | U | 1 |
| 17. | Name any two systems of Agriculture. | | CO2 | U | 1 |
| 18. | Define shifting cultivation. | | CO2 | U | 1 |
| 19. | Differentiate between sex and gender. | | CO5 | U | 1 |
| 20. | Who wrote the book – Pedagogy of the oppressed? | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the importance of agricultural heritage. | | CO1 | An | 5 |
| 22. | Explain the importance of agriculture as given in Thirukkural. | | CO1 | U | 5 |
| 23. | Explain the current scenario of Indian agriculture. | | CO3 | R | 5 |
| 24. | Discuss in brief Agro climatic zones of Tamil Nadu. | | CO2 | R | 5 |
| 25. | Discuss the characteristics of different types of soil found in India. | | CO2 | An | 5 |
| 26. | Explain the classification of crops based on climate along with suitable examples. | | CO2 | U | 5 |
| 27. | Explain the impacts of green revolution in India. | | CO3 | An | 5 |
| 28. | Differentiate between annual, biennial and perennial crops. | | CO2 | U | 5 |
| 29. | Discuss the terms gender blind and gender sensitive. | | CO4 | An | 5 |
| 30. | Draw the flow chart for organizational structure for Agricultural Universities. | | CO3 | U | 5 |
| 31. | Differentiate between practical and strategic gender needs. | | CO4 | An | 5 |
| 32. | Discuss the problems faced by women in agriculture. | | CO5 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write short notes on special category of crops. | CO2 | U | 8 |
|  | b. | Discuss the classification of crops based on use. | CO2 | R | 7 |
| 34. | a. | What do you understand by green revolution? Elaborate on the factors that led to green revolution and its major elements. | CO3 | A | 8 |
|  | b. | Define ergonomics and explain the different ergonomical characters that should be considered to prevent occupation related disorders in farm women. | CO6 | An | 7 |
| 35. | a. | What is ITK? Explain its importance in agriculture. | CO5 | An | 8 |
|  | b. | Explain the history of irrigation development in India. | CO1 | R | 7 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand agricultural heritage of India, agricultural resources and development of Indian agriculture from ancient to modern era. |
| CO2 | Compare indigenous traditional knowledge in agriculture and crop voyage in India and the world. |
| CO3 | Apply Indigenous Traditional Knowledge (ITK) in modern agricultural practices. |
| CO4 | Describe gender perspective, tasks of farm women, women empowerment and self-help groups. |
| CO5 | Visualize transition of agriculture from past to present. |
| CO6 | Acquire knowledge on gender issues in agriculture for women empowerment and implement women-friendly agricultural technologies. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 11 | 6 | - | 5 | - | - | 22 |
| CO2 | 12 | 22 | - | 5 | - | - | 39 |
| CO3 | 10 | 5 | 8 | 5 | - | - | 28 |
| CO4 | 1 | - | - | 10 | - | - | 11 |
| CO5 | 1 | 8 | - | 8 | - | - | 17 |
| CO6 | 1 | - | - | 7 | - | - | 8 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1002** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL HERITAGE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Expand FAO. | | CO1 | R | 1 |
| 2. | Inherited Value passed from one generation to other generation is called \_\_\_\_\_\_\_\_\_. | | CO6 | R | 1 |
| 3. | Write the full form of ITK | | CO1 | R | 1 |
| 4. | Father of Green revolution -------------. | | CO1 | R | 1 |
| 5. | Number of Agro climatic zones in Tamil Nadu ----------. | | CO1 | U | 1 |
| 6. | Enlist the stages of stone age | | CO1 | R | 1 |
| 7. | When was Imperial Agricultural Research Institute established | | CO3 | R | 1 |
| 8. | White revolution aimed to increase the production of ………. and ………………… products | | CO3 | R | 1 |
| 9. | Write the definition given by FAO for Agro-Climatic Zone? | | CO3 | R | 1 |
| 10. | Define Heritage? | | CO3 | R | 1 |
| 11. | Write the full form of ICAR | | CO3 | R | 1 |
| 12. | Which district comes under the high rainfall zone in Tamil Nadu? | | CO4 | R | 1 |
| 13. | Which is the most extensive soil found in India? | | CO5 | U | 1 |
| 14. | Enlist the major crop seasons. | | CO5 | U | 1 |
| 15. | Pradhanmantri Gram Sinchai Yojana is a scheme which provides to improve\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 16. | International Maize and Wheat Improvement Centre was located at ------------. | | CO1 | R | 1 |
| 17. | Write any two National Research Centers in India. | | CO1 | U | 1 |
| 18. | Define agricultural heritage. | | CO1 | U | 1 |
| 19. | Where is NDRI located? | | CO5 | U | 1 |
| 20. | Continuous record of past events is called as ----------------- | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss in brief Agro climatic zones of Tamil Nadu. | | CO1 | An | 5 |
| 22. | Discuss about roles and importance of ITK. | | CO1 | U | 5 |
| 23. | Write the importance of agriculture. | | CO3 | R | 5 |
| 24. | Mention the relationship between main branches of agriculture. | | CO2 | R | 5 |
| 25. | Write about importance of Agricultural Heritage. | | CO2 | An | 5 |
| 26. | Explain the importance of agriculture as given in Thirukkural. | | CO2 | U | 5 |
| 27. | Which are the different aspects of green revolution in India? | | CO3 | An | 5 |
| 28. | Name any 5 National research institutions along with their headquarters. | | CO2 | U | 5 |
| 29. | Draw the flow chart for organizational structure for Agricultural Universities. | | CO4 | An | 5 |
| 30. | Explain the multi-dimensional roles of women in Agriculture. | | CO5 | U | 5 |
| 31. | Explain the current scenario of Indian agriculture. | | CO4 | An | 5 |
| 32. | Define (i) History (ii) Heritage (iii) Astronomy (iv) Humus and (v) Green Revolution. | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write short notes on special category of crops | CO2 | U | 8 |
|  | b. | Write in detail about soil classification. | CO2 | R | 7 |
| 34. | a. | Discuss the different problems faced by women in Agriculture and suggestions to overcome them. | CO3 | A | 8 |
|  | b. | Explain the history of irrigation development in India. | CO6 | An | 7 |
| 35. | a. | Elaborate the impacts of green revolution in Indi. | CO5 | An | 8 |
|  | b. | What is ITK and its importance in agriculture? | CO1 | R | 7 |

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Understand agricultural heritage of India, agricultural resources and development of Indian agriculture from ancient to modern era | | | | | | | |
| CO2 | Compare indigenous traditional knowledge in agriculture and crop voyage in India and the world | | | | | | | |
| CO3 | Describe gender perspective, tasks of farm women, women empowerment and self-help groups | | | | | | | |
| CO4 | Apply Indigenous Traditional Knowledge (ITK) in modern agricultural practices | | | | | | | |
| CO5 | Visualize transition of agriculture from past to present | | | | | | | |
| CO6 | Acquire knowledge on gender issues in agriculture for women empowerment and implement women-friendly agricultural technologies | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** | |
| CO1 | | 12 | 8 | .. | 5 | .. | .. | 25 | |
| CO2 | | 18 | 18 | .. | 5 | .. | .. | 41 | |
| CO3 | | 10 | .. | 8 | 5 | .. | .. | 23 | |
| CO4 | | 1 | .. | .. | 10 | .. | .. | 11 | |
| CO5 | | 1 | 8 | .. | 8 | .. | .. | 17 | |
| CO6 | | 1 | .. | 7 | .. | .. | .. | 8 | |
|  | | | | | | | | **125** | |



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| **Course Code** | **21AG1003** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTION TO FORESTRY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name any two pastoral grass. | | CO1 | R | 1 |
| 2. | Botanical name of neem. | | CO1 | U | 1 |
| 3. | Pollarding is practiced in \_\_\_ crop. | | CO3 | R | 1 |
| 4. | What is scrub? | | CO4 | U | 1 |
| 5. | Name any two fruit trees. | | CO1 | R | 1 |
| 6. | Name any two timber forest trees. | | CO1 | U | 1 |
| 7. | How many tropical forest are there in India. | | CO2 | R | 1 |
| 8. | Name any two pastoral tree. | | CO1 | U | 1 |
| 9. | Mention the botanical name of tamarind. | | CO1 | U | 1 |
| 10. | The suitable age for practicing of coppicing is \_\_\_\_\_\_\_\_\_ | | CO2 | R | 1 |
| 11. | How many temperate forest are there in India. | | CO4 | R | 1 |
| 12. | Name any two shelterbelt trees. | | CO3 | U | 1 |
| 13. | What is the total accounts for scrub forest in India? | | CO3 | U | 1 |
| 14. | How many subtropical forest are there in India. | | CO3 | R | 1 |
| 15. | Name any two forest trees used for medicinal purpose. | | CO1 | U | 1 |
| 16. | Name any two windbreak trees. | | CO2 | U | 1 |
| 17. | What is total accounts for high forest in India. | | CO1 | U | 1 |
| 18. | Name any two deciduous forest trees. | | CO2 | R | 1 |
| 19. | Mention the botanical name of teak. | | CO1 | U | 1 |
| 20. | Name any two evergreen forest trees. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define pollarding with suitable examples. | | CO3 | R | 5 |
| 22. | Differentiate between the hortipasture and boundary plantation. | | CO4 | U | 5 |
| 23. | Define layering and its advantages. | | CO3 | R | 5 |
| 24. | Define cutting and its advantages. | | CO3 | U | 5 |
| 25. | Differentiate between the pastoral and its advantages. | | CO3 | R | 5 |
| 26. | Short note on multispecies cropping system. | | CO4 | R | 5 |
| 27. | Define budding and its advantages. | | CO3 | U | 5 |
| 28. | Differentiate between agrosilvipastoral and hortisilvopastoral system? | | CO3 | U | 5 |
| 29. | Explain the shifting cultivation. | | CO4 | E | 5 |
| 30. | Differentiate between the silvipasture and silvi-olericulture. | | CO3 | R | 5 |
| 31. | Explain about the alley cropping. | | CO2 | U | 5 |
| 32. | Define coppicing with suitable examples. | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Give a detailed account on clonal propagation and advantages and disadvantages. | CO2 | R | 8 |
|  | b. | Explain natural and artificial regeneration forestry. | CO2 | E | 7 |
| 34. | a. | Explain about the importance and scope of forestry. | CO1 | E | 8 |
|  | b. | Write a detailed account on constraints of forestry. | CO2 | R | 7 |
| 35. | a. | Give a detailed note on nitrogen cycle and phosphorous cycle. | CO6 | E | 7 |
|  | b. | Explain the types of forestry in India. | CO2 | R | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand the forest eco system and forest regeneration. |
| CO2 | Remember the concepts of agroforestry practiced in various agro ecosystems. |
| CO3 | Apply the knowledge for developing agro forestry, wind breaks, shelter belts, silviculture and social forestry. |
| CO4 | Recall the multipurpose trees in agroforestry systems. |
| CO5 | Analyze the impact of nitrogen fixation, carbon sequestration and develop strategies for climate mitigation. |
| CO6 | Explain the beneficial effects of agro forestry in relation to nitrogen fixation, soil conservation, litter dynamics and nutrient cycles. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | 7 | - | - | 8 | - | **17** |
| CO2 | 31 | 7 | - | - | 7 | - | **45** |
| CO3 | 22 | 17 | - | - | 0 | - | **39** |
| CO4 | 6 | 6 | - | - | 5 | - | **17** |
| CO5 | 0 | 0 | - | - | 0 | - | **0** |
| CO6 | 0 | 0 | - | - | 7 | - | **7** |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1003** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTION TO FORESTRY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | Botanical name of neem is \_\_\_\_\_\_ | | | CO1 | R | 1 |
| 2. | The use of clinometer is to measure the ---------------.   1. Tree weight b. Tree height c. Tree age d. Tree growth | | | CO1 | U | 1 |
| 3. | The root and shoot cuttings of teak crops is otherwise called as ---------.   1. Shoot stock b. Stumps c. Seedlings d. Root stock | | | CO3 | R | 1 |
| 4. | What is scrub? | | | CO4 | U | 1 |
| 5. | Name any two forest trees used for medicinal purpose. | | | CO1 | R | 1 |
| 6. | Name any two timber forest trees. | | | CO1 | U | 1 |
| 7. | The main object of management of forests is ----------- benefit. | | | CO2 | R | 1 |
| 8. | Name any two pastoral tree. | | | CO1 | U | 1 |
| 9. | Institute of Forest Biodiversity is located at Dehradun. (True / False) | | | CO1 | U | 1 |
| 10. | Name any two fruit trees. | | | CO2 | R | 1 |
| 11. | The forest cover with canopy density of 10 to 40% is classified as   1. Open Forest b. Forest c. Dense Forest d. Forest cover | | | CO4 | R | 1 |
| 12. | Name any two shelterbelt trees. | | | CO3 | U | 1 |
| 13. | How many subtropical forests are there in India? | | | CO3 | U | 1 |
| 14. | The --------------- represent land use systems involving deliberate management of multipurpose trees and shrubs in intimate association with annual & perennial agricultural crops and livestock within the compounds of individual houses.   1. home gardens b. gardens c. wood gardens d. rose gardens | | | CO3 | R | 1 |
| 15. | Name any two windbreak trees. | | | CO1 | U | 1 |
| 16. | The Tectona grandis not comes under the classification of timber tree species. (True / False) | | | CO2 | U | 1 |
| 17. | The fast growing crops are recommended for Improved fallow system. (True / False) | | | CO1 | U | 1 |
| 18. | Integrated farming system concepts are not used in Communal forest.(True / False) | | | CO2 | R | 1 |
| 19. | The Sub - Alpine Forests is not available in Tamil Nadu region.(True / False) | | | CO1 | U | 1 |
| 20. | Name any two evergreen forest trees. | | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Compare and contrast for wind breakers with shelter belts with illustration. | | | CO3 | R | 5 |
| 22. | Differentiate between the hortipasture and boundary plantation. | | | CO4 | U | 5 |
| 23. | List out the objectives and importance of sliviculture. | | | CO3 | R | 5 |
| 24. | Discuss about the factors affecting tree seed dispersal. | | | CO3 | U | 5 |
| 25. | Differentiate between the pastoral and its advantages. | | | CO3 | R | 5 |
| 26. | Define multipurpose trees and give the advantages over other tree species. | | | CO4 | R | 5 |
| 27. | Explain about the alley cropping. | | | CO3 | U | 5 |
| 28. | Differentiate between agrosilvipastoral and hortisilvopastoral system? | | | CO3 | U | 5 |
| 29. | Define coppicing with suitable examples. | | | CO4 | E | 5 |
| 30. | Differentiate between the silvipasture and silvi-olericulture. | | | CO3 | R | 5 |
| 31. | Define budding and its advantages. | | | CO2 | U | 5 |
| 32. | Explain the shifting cultivation. | | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Give a detailed note on artificial forest regeneration and write about objectives, factors and its techniques. | CO2 | R | 8 |
|  | | b. | Discuss about natural forest regeneration and write about objectives, factors and its techniques. | CO2 | E | 7 |
|  | |  |  |  |  |  |
| 34. | | a. | Explain about the importance and scope of forestry. | CO1 | R | 8 |
|  | | b. | Write a detailed on constraints of forestry. | CO2 | R | 7 |
|  | |  |  |  |  |  |
| 35. | | a. | Elaborate the salient featuresforNational Forestry policy  (1855, 1894, 1952 and 1988) | CO6 | R | 7 |
|  | | b. | Discus about types of forest in India by Champion and Seth. | CO2 | R | 8 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the forest eco system and forest regeneration. |
| CO2 | Remember the concepts of agroforestry practiced in various agro ecosystems. |
| CO3 | Apply the knowledge for developing agro forestry, wind breaks, shelter belts, silviculture and social forestry. |
| CO4 | Recall the multipurpose trees in agroforestry systems. |
| CO5 | Analyze the impact of nitrogen fixation, carbon sequestration and develop strategies for climate mitigation. |
| CO6 | Explain the beneficial effects of agro forestry in relation to nitrogen fixation, soil conservation, litter dynamics and nutrient cycles. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 9 | 7 | - | - | 0 | - | **16** |
| CO2 | 30 | 8 | - | - | 7 | - | **45** |
| CO3 | 22 | 17 | - | - | 0 | - | **39** |
| CO4 | 6 | 6 | - | - | 5 | - | **17** |
| CO5 | 0 | 0 | - | - | 0 | - | **0** |
| CO6 | 8 | 0 | - | - | 0 | - | **8** |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1051** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF AGRICULTURAL ECONOMICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is National Income NI? | | CO1 | U | 1 |
| 2. | Write down the formula for Price Elasticity of Demand. | | CO2 | R | 1 |
| 3. | Recall the other name for Macroeconomics. | | CO2 | R | 1 |
| 4. | Who has given growth definition of economics? | | CO1 | R | 1 |
| 5. | Supply Curve is upward sloping curve (True/False). | | CO2 | An | 1 |
| 6. | Differentiate Interest and Profit. | | CO3 | U | 1 |
| 7. | Car and Petrol are Competitive products. True/False. | | CO3 | An | 1 |
| 8. | Reward paid for Labour is called as………… | | CO3 | R | 1 |
| 9. | A monopoly is a market with------seller. | | CO3 | R | 1 |
| 10. | What is the term used to indicate the destruction of utilities. | | CO1 | R | 1 |
| 11. | Define Wealth definition of Economics . | | CO1 | R | 1 |
| 12. | What is GST? | | CO5 | U | 1 |
| 13. | Which utility concept measure the utilities of two commodities in utils? | | CO2 | U | 1 |
| 14. | State Law of Diminishing Marginal Utility. | | CO2 | R | 1 |
| 15. | Example for Mixed Economic system is \_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 16. | How many stages are there in a production function? | | CO6 | U | 1 |
| 17. | What are all the vital Factors of Production? | | CO4 | R | 1 |
| 18. | Which bank acts as Central Bank of India? | | CO4 | An | 1 |
| 19. | Define Market. | | CO3 | R | 1 |
| 20. | The concept of Division of labour is proposed by ---------. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss in Detail about types of Business Organizations. | | CO6 | R | 5 |
| 22. | Explain in brief about various market structure. | | CO3 | U | 5 |
| 23. | What is your understanding about various theories of population? | | CO3 | U | 5 |
| 24. | Explain the method of calculating NI. | | CO4 | A | 5 |
| 25. | Importance of Five-Year plan in India. | | CO1 | U | 5 |
| 26. | Explain the law of Supply and factors affecting Supply. | | CO1 | U | 5 |
| 27. | Discriminate Direct and Indirect Tax. | | CO5 | R | 5 |
| 28. | Discuss bater system of exchange . | | CO1 | R | 5 |
| 29. | What is meant by agricultural finance and give a brief note on institutional sources of credit? | | CO4 | U | 5 |
| 30. | Illustrate three factors of production function and their characteristics. | | CO6 | R | 5 |
| 31. | What are the types of utility? Write short notes with suitable examples. | | CO2 | R | 5 |
| 32. | Write a short note on the price elasticity of demand and interpret it based on its degrees. | | CO3 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following** | | | | | |
| 33. | a. | Explain about Banking System in India and discuss the functions of Commercial Bank. | CO4 | R | 7.5 |
|  | b. | Explain in detail the utility and two approaches of utility and indifference Curve Analysis. | CO2 | U | 7.5 |
| 34. | a. | What are the functions of Money? Explain the different types of Money. | CO4 | U | 7.5 |
|  | b. | What is elasticity of demand? Briefly narrate the importance and measurement of elasticity of demand. | CO3 | An | 7.5 |
| 35. | a. | Explain in detail the consumer surplus with diagram. | CO2 | R | 7.5 |
|  | b. | What is public revenue? Explain the major sources of revenue for the government. | CO5 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the principle and theories, and its role in planning for economic development of the country. |
| CO2 | Remember consumer behaviour - utility maximization problem and demand theory. |
| CO3 | Explain fundamental concepts of agricultural economics, theory of production, theory of cost and output determination across market structures. |
| CO4 | Evaluate different agricultural finance systems and their role as credit agencies. |
| CO5 | Enumerate and discuss different taxes applicable to agriculture. |
| CO6 | Analise theory of general equilibrium and welfare economics. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 9 | 11 | - | - | - | - | 20.0 |
| CO2 | 15.5 | 8.5 | - | 1 | - | - | 25.0 |
| CO3 | 4 | 11 | - | 13.5 | - | - | 28.5 |
| CO4 | 8.5 | 12.5 | 5 | 1 | - | - | 27.0 |
| CO5 | 7.5 | 6 | - | - | - |  | 13.5 |
| CO6 | 10 | 1 | - | - | - | - | 11.0 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1051** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF AGRICULTURAL ECONOMICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | State the Law of Equi-Marginal Utility. | | CO1 | R | 1 |
| 2. | What are the defects in Adam Smith’s definition of economics? | | CO1 | U | 1 |
| 3. | Differentiate wealth and welfare. | | CO1 | A | 1 |
| 4. | What are Complementary goods? Give an example. | | CO2 | U | 1 |
| 5. | Define Consumer equilibrium. | | CO2 | R | 1 |
| 6. | Differentiate positive science and normative science. | | CO1 | A | 1 |
| 7. | Define producer surplus. | | CO2 | R | 1 |
| 8. | Describe the characteristics of land. | | CO3 | U | 1 |
| 9. | Define Supply and stock. | | CO2 | R | 1 |
| 10. | What is break-even point. | | CO3 | U | 1 |
| 11. | Explain briefly diamond-water paradox. | | CO2 | An | 1 |
| 12. | When the backward bending supply curve occurs? | | CO3 | E | 1 |
| 13. | Define Engel’s Law on Family Expenditure. | | CO2 | R | 1 |
| 14. | Define Money. | | CO4 | R | 1 |
| 15. | What is Stagflation? | | CO4 | U | 1 |
| 16. | Define Cross elasticity of demand. | | CO2 | R | 1 |
| 17. | Graphically explain AFC. | | CO3 | A | 1 |
| 18. | List out the types of market based on area/coverage. | | CO3 | R | 1 |
| 19. | What is GST? | | CO5 | U | 1 |
| 20. | Define Welfare economics. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the characteristics of wants. | | CO1 | U | 5 |
| 22. | Explain indifference curve and its properties with graphical representation. | | CO2 | R | 5 |
| 23. | Differentiate central bank and commercial bank. | | CO4 | A | 5 |
| 24. | Define National income, its concepts and difficulties in the measurement of National income. | | CO4 | U | 5 |
| 25. | List out the types of money. | | CO4 | R | 5 |
| 26. | Explain about the functions of entrepreneur. | | CO3 | A | 5 |
| 27. | What are the objectives of economic planning? | | CO1 | R | 5 |
| 28. | Explain about risk bearing theory and uncertainty-bearing theory of profit. | | CO3 | U | 5 |
| 29. | Write the characteristics of TPP, MPP and APP. | | CO3 | A | 5 |
| 30. | What are the types of wealth? | | CO1 | R | 5 |
| 31. | Explain the factors determining labour efficiency. | | CO3 | U | 5 |
| 32. | List out the types of elasticity and its criteria. | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the different economic systems with its merits and demerits. | CO3 | U | 7.5 |
|  | b. | Explain the different cost concepts with graphical representation. | CO3 | A | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Explain the degrees of elasticity of supply with graphical Representation. | CO2 | A | 7.5 |
|  | b. | Write about Optimum theory of population. | CO6 | R | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Define inflation. Explain different types of inflation. | CO4 | U | 7.5 |
|  | b. | Graphically explain Law of Diminishing Marginal Utility with assumptions and its limitations. | CO2 | A | 7.5 |
|  |  |  |  |  |  |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand the principle and theories, and its role in planning for economic development of the country. |
| CO2 | Remember consumer behaviour - utility maximization problem and demand theory. |
| CO3 | Explain fundamental concepts of agricultural economics, theory of production, theory of cost and |
|  | Output determination across market structures. |
| CO4 | Evaluate different agricultural finance systems and their role as credit agencies. |
| CO5 | Enumerate and discuss different taxes applicable to agriculture. |
| CO6 | Analyse theory of general equilibrium and welfare economics. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 11 | 6 | 2 | - | - | - | 19 |
| CO2 | 15 | 1 | 15 | 1 | - | - | 32 |
| CO3 | 1 | 19.5 | 18.5 | - | 1 | - | 40 |
| CO4 | 6 | 13.5 | 5 | - | - | - | 24.5 |
| CO5 | - | 1 | - | - | - | - | 1 |
| CO6 | 8.5 | - | - | - | - | - | 8.5 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1101** | **Duration** | **3hrs** |
| **Course Name** | **COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define feedback. | | CO5 | R | 1 |
| 2. | …….is the mental process resulting in the selection of a course of action among several alternatives. | | CO1 | R | 1 |
| 3. | The feeling of being overwhelmed or unable to cope with mental or emotional pressure (Excitement, Stress, Lethargy). | | CO5 | R | 1 |
| 4. | ................... is the rules governing formation of sentences (Syntax/ Grammar/ Morphemes/ Adjective). | | CO2 | R | 1 |
| 5. | What is the term used for a way of summarizing, in which the meaning of the original text is maintained. | | CO3 | R | 1 |
| 6. | Mass communication involves a person sending messages to -------------- number of receivers/audience. | | CO5 | R | 1 |
| 7. | What is called a comprehensive technique to judge the suitability of an individual and his appropriateness for admission, scholarship, job, etc | | CO4 | R | 1 |
| 8. | Name the process of designing and delivering a message to an audience (Public speaking, Presentation, Summarizing) | | CO5 | R | 1 |
| 9. | Verbal communication always involve either spoken or written …………… | | CO2 | R | 1 |
| 10. | \_\_\_\_\_\_\_\_\_\_\_ is the presentation of a short message without advance preparation (Manuscript speaking, Impromptu speaking, Memorized speaking, extempore). | | CO5 | R | 1 |
| 11. | The word communication is derived from the latin word……… | | CO1 | R | 1 |
| 12. | ……stress have a beneficial effect on health, motivation, performance and well-being. | | CO3 | R | 1 |
| 13. | What is SQ3R method? | | CO2 | R | 1 |
| 14. | Name any one purpose for giving an oral presentation. | | CO2 | R | 1 |
| 15. | Name a situation where you use skimming. | | CO2 | R | 1 |
| 16. | The distance between two individuals in social distance is more than that in public distance (True/ False). | | CO5 | R | 1 |
| 17. | What is SWOT analysis? | | CO5 | R | 1 |
| 18. | Mention 2 ways of note taking. | | CO2 | R | 1 |
| 19. | A communication is not complete without……………… | | CO1 | R | 1 |
| 20. | ………… is the feeling of being overwhelmed or unable to cope with mental or emotional pressure. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Name the symptoms of stress. | | CO6 | R | 5 |
| 22. | What are the different ways to improve your personality. | | CO6 | R | 5 |
| 23. | Define leadership and the traits of a leader. | | CO5 | R | 5 |
| 24. | What are the do’s and dont’s in group discussion. | | CO4 | R | 5 |
| 25. | Define Impromptu, extempore, memorized, manuscript speaking. | | CO4 | R | 5 |
| 26. | What are the activities involved in organizing a seminar. | | CO4 | R | 5 |
| 27. | Explain the different types of interviews and tips to perform well in an interview. | | CO6 | R | 5 |
| 28. | Describe the different forms of non-verbal communication. | | CO2 | A | 5 |
| 29. | Prepare a one-page resume indicating your contact details (imaginary), educational information, internship experience, skills, extracurricular activities, language proficiency and achievements for applying for a job. | | CO6 | A | 5 |
| 30. | Explain Sheldon’s classification of personality types. | | CO5 | E | 5 |
| 31. | Give a brief account on Organizational communication (Directions in a communication). | | CO5 | U | 5 |
| 32. | Distinguish between Verbal Vs Non Verbal communication. | | CO5 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Elaborate the Decision making process. | CO2 | C | 8 |
|  | b. | Explain about stress and methods to manage stress. | CO6 | C | 7 |
| 34. | a. | Discuss about the various leadership styles. | CO5 | An | 8 |
|  | b. | What is Communication? Describe the steps in communication process. | CO5 | R | 7 |
| 35. | a. | Explain the methods used for reading scientific and technical articles (ERRQ, SQ3R). | CO2 | U | 7 |
|  | b. | Write about the following reading strategies: Skimming, Scanning, Extensive reading and Intensive reading. | CO2 | E | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | | **COURSE OUTCOMES** | | | | | | | |
| CO1 | | Apply indexing, footnote and  bibliographic procedures. | | | | | | | |
| CO2 | | Understand the comprehension of articles. | | | | | | | |
| CO3 | | Summarize and abstract. | | | | | | | |
| CO4 | | Participate and organize group discussions and seminars. | | | | | | | |
| CO5 | | Develop listening, writing and oral presentation skills. | | | | | | | |
| CO6 | | Maintain field diary and lab record. | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | | |
| **CO / P** | | **R** | **U** | **A** | **An** | **E** | **C** | **Total** | |
| CO1 | | 3 |  |  |  |  |  |  | |
| CO2 | | 6 | 7 | 5 |  | 8 | 8 |  | |
| CO3 | | 3 |  |  |  |  |  |  | |
| CO4 | | 16 |  |  |  |  |  |  | |
| CO5 | | 19 | 5 | 5 | 8 | 5 |  |  | |
| CO6 | | 15 |  | 5 |  |  | 7 |  | |
|  | | | | | | | | **125** | |



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| **Course Code** | **21AG1101** | **Duration** | **3hrs** |
| **Course Name** | **COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Communication. | | CO2 | U | 1 |
| 2. | Define Précis writing. | | CO4 | A | 1 |
| 3. | Difference between Field diary and lab record. | | CO5 | U | 1 |
| 4. | Define Mind Mapping method. | | CO5 | R | 1 |
| 5. | Explain Cornell types of note making. | | CO5 | R | 1 |
| 6. | Difference between the Skimming and Scanning. | | CO3 | U | 1 |
| 7. | Compare the difference between academic and non-academic writing. | | CO3 | A | 1 |
| 8. | Explain Personality development. | | CO6 | U | 1 |
| 9. | Draw a diagram of William Schramm models of communication. | | CO2 | R | 1 |
| 10. | Define Supplementary reading. | | CO3 | U | 1 |
| 11. | Distinguish Encoding & Decoding. | | CO2 | R | 1 |
| 12. | Define Downward communication. | | CO2 | U | 1 |
| 13. | How to analysis SWOT. | | CO5 | An | 1 |
| 14. | Define Autocratic Leadership. | | CO4 | U | 1 |
| 15. | Write about Stress Management. | | CO6 | R | 1 |
| 16. | Difference between the Foot Notes and Citation. | | CO3 | R | 1 |
| 17. | Characteristics of effective communication. | | CO2 | R | 1 |
| 18. | Explain Curriculum Vitae (CV). | | CO5 | A | 1 |
| 19. | Write the importance of Self Confidence. | | CO5 | A | 1 |
| 20. | Define Summary. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the types of communication. | | CO2 | R | 5 |
| 22. | Explain the types of Writing Skill. | | CO3 | R | 5 |
| 23. | Describe the Observations and Impressions of Field Diary. | | CO3 | U | 5 |
| 24. | Don’ts of precise writing. | | CO1 | U | 5 |
| 25. | Factors influencing Attitude. | | CO4 | A | 5 |
| 26. | Describe the aspects of reading comprehensions. | | CO3 | R | 5 |
| 27. | Explain the various techniques of Active Listening. | | CO3 | U | 5 |
| 28. | Write the details of types of indexing. | | CO1 | R | 5 |
| 29. | Write the details of barriers of communication. | | CO2 | A | 5 |
| 30. | List the advantages and disadvantages of group presentations. | | CO5 | A | 5 |
| 31. | Importance and necessity of Decision Making. | | CO6 | U | 5 |
| 32. | Types of Leadership styles. | | CO4 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe the Oral Presentation and its rules of effective Oral presentation. | CO4 | A | 7.5 |
|  | b. | Write the details of elements of communication. | CO2 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Explain the note making methods and its types. | CO5 | A | 7.5 |
|  | b. | Describe on Assessment of Leadership Skills. | CO4 | An | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Describe the Do’s and Don’ts of Abstract writing. | CO1 | U | 7.5 |
|  | b. | Explain the types of Reading Skill. | CO3 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Acquire basic skills in grammar. |
| CO2 | Gain an understanding of the process of communication. |
| CO3 | Acquire comprehension skills in reading and listening. |
| CO4 | Present ideas independently. |
| CO5 | Organize events and make plans systematically. |
| CO6 | Participate in decision making process and share different view points. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 5 | 12.5 | - | - | - | - | 17.5 |
| CO2 | 8 | 9.5 | 5 | - | - | - | 22.5 |
| CO3 | 18.5 | 12 | 1 | - | - | - | 31.5 |
| CO4 | - | 2 | 18.5 | 7.5 | - | - | 28 |
| CO5 | 2 | 1 | 14.5 | 1 | - | - | 18.5 |
| CO6 | 1 | 6 | - | - | - | - | 7 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1151** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF ENTOMOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | Insects belong to class \_\_\_\_\_\_\_\_\_\_. | | | CO1 | R | 1 |
| 2. | The filter chamber mechanism is found in \_\_\_\_\_\_\_\_\_\_ group of insects. | | | CO3 | U | 1 |
| 3. | Chewing and lapping mouthparts is present in \_\_\_\_\_\_\_\_\_\_. | | | CO2 | A | 1 |
| 4. | The study of the arrangement of setae in insect body is known as \_\_\_\_\_\_\_\_\_\_. | | | CO3 | An | 1 |
| 5. | Larva of mosquito is called as \_\_\_\_\_\_\_\_\_\_. | | | CO3 | R | 1 |
| 6. | Honey bees possesses \_\_\_\_\_\_\_\_\_\_ type of antenna | | | CO2 | R | 1 |
| 7. | Outermost layer of the insect's body wall is \_\_\_\_\_\_\_\_\_\_. | | | CO5 | U | 1 |
| 8. | The eggs of cockroaches are called \_\_\_\_\_\_\_\_\_\_. | | | CO3 | R | 1 |
| 9. | The first Entomologist to the Government of India was \_\_\_\_\_\_\_\_\_\_. | | | CO1 | R | 1 |
| 10. | Insects have \_\_\_\_\_\_\_\_\_\_ type of circulatory system. | | | CO3 | U | 1 |
| 11. | What do you mean by biological control of pest management? | | | CO6 | An | 1 |
| 12. | Type of wing coupling mechanism in honeybees is \_\_\_\_\_\_\_\_\_\_. | | | CO2 | U | 1 |
| 13. | Piercing and sucking unit of Hemiptera bug consists of .... Stylets | | | CO4 | A | 1 |
| 14. | Johnston’s organ is present in \_\_\_\_\_\_\_\_\_\_ segment of antenna. | | | CO2 | R | 1 |
| 15. | Reduvid bugs belong to the family \_\_\_\_\_\_\_\_\_\_. | | | CO4 | U | 1 |
| 16. | Cornicles are present in \_\_\_\_\_\_\_\_\_\_ insect. | | | CO2 | R | 1 |
| 17. | Important organ involved in blood circulation in insects is \_\_\_\_\_\_\_\_\_\_. | | | CO3 | R | 1 |
| 18. | Destructive Insects and Pests Act was enforced in the year \_\_\_\_\_\_\_\_\_\_. | | | CO6 | R | 1 |
| 19. | Naiads of dragonflies respire through \_\_\_\_\_\_\_\_\_\_. | | | CO3 | A | 1 |
| 20. | Moulting hormone is secreted by \_\_\_\_\_\_\_\_\_\_. | | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Differentiate the subfamily Caelifera and Ensifera. | | | CO4 | An | 5 |
| 22. | Write about different types of antennae present in insects with examples. | | | CO3 | E | 5 |
| 23. | Define moulting and explain various steps involved in moulting. | | | CO3 | C | 5 |
| 24. | Differentiate Heteroptera and Homoptera. | | | CO4 | An | 5 |
| 25. | Write about the types of neurons in insects. | | | CO3 | U | 5 |
| 26. | Draw a neat labelled diagram of a typical insect leg and list out different types of insect legs with examples. | | | CO2 | R | 5 |
| 27. | Elucidate various types of the insect head. | | | CO2 | R | 5 |
| 28. | Define metamorphosis. Describe different types of metamorphosis with suitable examples. | | | CO3 | R | 5 |
| 29. | Mention the important characters of the insect order Coleoptera. | | | CO4 | U | 5 |
| 30. | Draw and label the neat diagram of female reproductive system in insects. | | | CO3 | An | 5 |
| 31. | Differentiate Anisoptera and Zygoptera. | | | CO4 | An | 5 |
| 32. | Explain the wing coupling mechanism in insects. | | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Discuss the reasons for insect dominance on the earth. | CO1 | R | 7.5 |
|  | | b. | Draw the structure of the digestive system and explain its regions. | CO3 | U | 7.5 |
|  | |  |  |  |  |  |
| 34. | | a. | What are the general characteristics of Hymenoptera? Explain any four families of agricultural importance with examples. | CO1 | U | 7.5 |
|  | | b. | What are the general characteristics of Lepidoptera? Explain any four families of agricultural importance with examples. | CO4 | R | 7.5 |
|  | |  |  |  |  |  |
| 35. | | a. | What are the general characteristics of Coleoptera? Explain any four families of agricultural importance with examples. | CO6 | U | 7.5 |
|  | | b. | Brief about types of larvae and pupae in insects. | CO6 | R | 7.5 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the origin and evolution of Insects. |
| CO2 | Understand the insect external body parts and their modifications. |
| CO3 | Understand the anatomy of internal organs and their functions. |
| CO4 | Remember the insect orders and families of agriculturally important pests. |
| CO5 | Analyze the factors influencing pest occurrence. |
| CO6 | Apply the fundamental knowledge on insects in their effective and integrated management strategies. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 9.5 | 7.5 | - | - | - | - | 17 |
| CO2 | 13 | 1 | 1 | - | - | - | 15 |
| CO3 | 9 | 19.5 | - | 6 | 5 | 5 | 44.5 |
| CO4 | 7.5 | 6 | 1 | 15 | - | - | 29.5 |
| CO5 | 1 | 1 | - | - | - | - | 2 |
| CO6 | 8.5 | 7.5 | - | 1 | - | - | 17 |
|  | | | | | | | **125** |



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| **Course Code** | **20AG1201** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF GENETICS** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The constricted region of chromosome that holds the sister chromatids together is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 2. | The type of cell division that occurs in somatic cells is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 3. | What is ‘Back cross’? | | CO1 | R | 1 |
| 4. | Alternate form of gene is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | U | 1 |
| 5. | Give examples of mutagens. | | CO4 | R | 1 |
| 6. | What is multiple allele? | | CO2 | R | 1 |
| 7. | The double helical structure of DNA was proposed by \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | R | 1 |
| 8. | The nucleotide bases in DNA i.e., A, T, G and C is expanded as \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 9. | Meiotic division is otherwise called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 10. | Protein synthesis is associated with which cell organelle? | | CO5 | R | 1 |
| 11. | Gamma and EMS are examples of \_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 12. | The condition in which one chromosome is missing from a pair of chromosomes is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 13. | In which phase of cell division, the chromosomes align at the center of the cell? | | CO2 | U | 1 |
| 14. | What is meant by transversion? | | CO3 | U | 1 |
| 15. | Which cell organelles contain DNA? | | CO6 | A | 1 |
| 16. | A type of chromosome in which the centromere is at the ends is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 17. | The process of copying a segment of DNA into RNA is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | U | 1 |
| 18. | What is Linkage? | | CO2 | R | 1 |
| 19. | Mitotic division is otherwise called \_\_\_\_\_\_\_\_\_\_ division. | | CO2 | U | 1 |
| 20. | The biological process of producing two identical replicas of DNA from one original DNA molecule is called ----------------. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | List the different types of chromosomes. | | CO3 | R | 5 |
| 22. | Explain the transcription of DNA. | | CO5 | U | 5 |
| 23. | Explain quantitative and qualitative traits with examples. | | CO1 | R | 5 |
| 24. | Diagrammatically explain the structure of chromosome and its parts. | | CO3 | R | 5 |
| 25. | Explain the inheritance of blood group. | | CO2 | A | 5 |
| 26. | Explain incomplete dominance and co-dominance with examples. | | CO2 | U | 5 |
| 27. | Differentiate sex limited and sex influenced traits. | | CO2 | R | 5 |
| 28. | Explain epistatic interactions with example. | | CO2 | U | 5 |
| 29. | What is multiple allelism? What is pleiotropism? | | CO2 | R | 5 |
| 30. | What is cytoplasmic inheritance? Give examples. | | CO6 | U | 5 |
| 31. | Write the difference between Monoploid, haploid and diploid. | | CO3 | R | 5 |
| 32. | Differentiate ‘Back cross’ and ‘Test cross’ and where is it used. | | CO1 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Diagrammatically describe the different stages of meiosis. | CO2 | U | 7 |
|  | b. | Explain the various structural chromosomal aberrations. | CO3 | R | 8 |
|  |  |  |  |  |  |
| 34. | a. | Explain Mendel’s Laws of Inheritance. | CO 1 | R | 7 |
|  | b. | Explain Mitosis with neat diagram and its significance. | CO2 | U | 8 |
|  |  |  |  |  |  |
| 35. | a. | Give the classification of mutation with examples. | CO4 | R | 7 |
|  | b. | Define DNA replication. Explain the different modes of DNA replication. | CO5 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Solve problems on Mendelian genetics. |
| CO2 | Construct gene map using linkage. |
| CO3 | Identify the type of aberrations and its usage in agriculture. |
| CO4 | Understand inducing mutation by artificial methods. |
| CO5 | Explain the central dogma of life. |
| CO6 | Adopt the knowledge of cytoplasmic inheritance in plant breeding. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 18 | 1 | - | - | - | - | 19 |
| CO2 | 13 | 30 | 5 | - | - | - | 48 |
| CO3 | 23 | 1 | - | - | - | - | 24 |
| CO4 | 9 | - | - | - | - | - | 9 |
| CO5 | 2 | 17 | - | - | - | - | 19 |
| CO6 | - | 5 | 1 | - | - | - | 6 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1201** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF GENETICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Cell theory. | | CO1 | U | 1 |
| 2. | Differentiate between Law of Segregation and Law of Independent Assortment. | | CO1 | R | 1 |
| 3. | Write about Lethal genes. | | CO2 | U | 1 |
| 4. | What is Chromatin? | | CO2 | U | 1 |
| 5. | What is Histone Proteins? | | CO5 | R | 1 |
| 6. | Describe about Heterochromatin. | | CO5 | R | 1 |
| 7. | Difference between Diploids and Haploids. | | CO2 | R | 1 |
| 8. | Write about Polytene chromosomes. | | CO3 | R | 1 |
| 9. | What is the Significance of Cytoplasmic Inheritance? | | CO3 | R | 1 |
| 10. | What is the Consequence of mitotic division? | | CO3 | An | 1 |
| 11. | Describe the metaphase stage of cell division. | | CO3 | U | 1 |
| 12. | What is cytokinesis? | | CO3 | U | 1 |
| 13. | What is spindle fibre? | | CO2 | R | 1 |
| 14. | Define Expressivity. | | CO2 | R | 1 |
| 15. | Define Penetrance. | | CO4 | R | 1 |
| 16. | Define pleiotropy. | | CO4 | R | 1 |
| 17. | X-linked genetic disorders. | | CO4 | U | 1 |
| 18. | Write about chromosome doubling. | | CO2 | R | 1 |
| 19. | Difference between Transcription and translation. | | CO5 | U | 1 |
| 20. | Difference between DNA and RNA. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the Mendel's Laws of Inheritance. | | CO1 | U | 5 |
| 22. | Write short note on lampbrush chromosomes. | | CO2 | R | 5 |
| 23. | Role and Significance of mitosis in crop plants. | | CO3 | U | 5 |
| 24. | Difference Between Mitosis and Meiosis. | | CO3 | R | 5 |
| 25. | Write any five differences between oligogenic and polygenic traits. | | CO2 | U | 5 |
| 26. | Write about Multiple alleles and give two examples. | | CO4 | U | 5 |
| 27. | What is crossing over? | | CO2 | U | 5 |
| 28. | Define epitasis and list the types. | | CO3 | R | 5 |
| 29. | Write the short note on Epigenetic effect in living organism. | | CO4 | U | 5 |
| 30. | What is the ‘Central Dogma’? | | CO5 | U | 5 |
| 31. | Write short note on genetic code. | | CO5 | U | 5 |
| 32. | Narrate about Lac Operon concept. | | CO5 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What is polyploidy? Explain the types. | CO3 | R | 7.5 |
|  | b. | Write the significance of crossing over. | CO1 | U | 7.5 |
| 34. | a. | Write the types of chromosome. | CO2 | U | 7.5 |
|  | b. | Define mutation. Explain different type of mutation. | CO4 | U | 7.5 |
| 35. | a. | Write a short note on genetic code. | CO5 | R | 7.5 |
|  | b. | Write about the steps involved in DNA replication and list the enzymes involved. | CO5 | R | 7.5 |

CO – COURSE OUTCOME BL – BLOOM’S LEVEL

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|  | COURSE OUTCOMES |
| CO1 | Solve problems on Mendelian genetics. |
| CO2 | Construct gene map using linkage. |
| CO3 | Identify the type of aberrations and its usage in agriculture. |
| CO4 | Understand inducing mutation by artificial methods. |
| CO5 | Explain the central dogma of life. |
| CO6 | Adopt the knowledge of cytoplasmic inheritance in plant breeding. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 5+7.5 |  |  |  |  |  |
| CO2 | 3+5 | 3+10+7.5 |  |  |  |  |  |
| CO3 | 2+10+7.5 | 2+10 |  |  |  |  |  |
| CO4 | 2 | 3+10+7.5 |  |  |  |  |  |
| CO5 | 2+5+15 | 2+10 |  |  |  |  |  |
| CO6 |  |  |  |  |  |  |  |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1301** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF SOIL SCIENCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | Define soil pollution. | | | CO6 | U | 1 |
| 2. | What are Master horizons? | | | CO1 | R | 1 |
| 3. | Write the size of soil colloidal particle. | | | CO3 | R | 1 |
| 4. | List out the methods of soil textural analysis. | | | CO2 | A | 1 |
| 5. | What are the sources of charges on clays? | | | CO3 | R | 1 |
| 6. | Define is pore space. | | | CO2 | U | 1 |
| 7. | Define metamorphic rock. | | | CO1 | U | 1 |
| 8. | Is capillary water available or unavailable to plant? | | | CO2 | A | 1 |
| 9. | List out the soil forming factors. | | | CO1 | R | 1 |
| 10. | Define podsolization. | | | CO1 | U | 1 |
| 11. | What is soil EC? | | | CO3 | R | 1 |
| 12. | Define biological weathering of soil. | | | CO1 | R | 1 |
| 13. | Define pedochromic. | | | CO1 | R | 1 |
| 14. | What is endodynamomorphic? | | | CO1 | U | 1 |
| 15. | Which soil structure is good for agriculture? | | | CO3 | A | 1 |
| 16. | Give an example for 1:1 clay mineral. | | | CO3 | R | 1 |
| 17. | Define CEC. | | | CO4 | U | 1 |
| 18. | What is buffering of soil? | | | CO4 | R | 1 |
| 19. | What is soil flora and fauna? | | | CO5 | R | 1 |
| 20. | Name the microorganisms involving in N transformation in soil. | | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Briefly discuss the biological classification of soil water. | | | CO2 | An | 5 |
| 22. | Explain the role of soil microorganism in soil fertility. | | | CO5 | An | 5 |
| 23. | Define weathering. Briefly explain the physical weathering of soil. | | | CO1 | U | 5 |
| 24. | Write about soil water potentials. | | | CO3 | U | 5 |
| 25. | Polyphenol theory. | | | CO5 | U | 5 |
| 26. | Fundamental soil forming processes. | | | CO1 | R | 5 |
| 27. | Major characteristics of three soil separates. | | | CO3 | R | 5 |
| 28. | What is pH scale and explain the types of acidity. | | | CO4 | An | 5 |
| 29. | Buffering capacity of soil and their importance. | | | CO4 | R | 5 |
| 30. | What are the Soil forming factors? | | | CO1 | U | 5 |
| 31. | List out any five endopedons and explain them. | | | CO2 | R | 5 |
| 32. | Draw a soil profile and explain the various horizons. | | | CO1 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Elaborate the origin, classification and role of soil organic matter in soil fertility. | CO5 | A | 8 |
|  | | b. | Soil colloids and their types – explain. | CO4 | U | 7 |
| 34. | | a. | Explain the types of soil in India. | CO2 | A | 8 |
|  | | b. | Give a detailed account on Specific soil forming processes. | CO1 | An | 7 |
| 35. | | a. | What is soil pollution? Behavior of organic and inorganic contaminants of soil. | CO6 | An | 8 |
|  | | b. | Enumerate the classification of soil structure. | CO3 | U | 7 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the genesis, pedological and edaphological concepts of soil. |
| CO2 | Remember different system of soil classification. |
| CO3 | Explain and evaluate the physical properties of soil. |
| CO4 | Explain and estimate the physio-chemical properties of soil. |
| CO5 | Describe the biological properties of soil and its influence. |
| CO6 | Analyze the soil pollutant factors and recommend suitable remedial measures for soil improvement. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 9 | 13 | - | 12 |  |  | 34 |
| CO2 | 5 | 1 | 10 | 5 |  |  | 21 |
| CO3 | 9 | 12 | 1 | - |  |  | 22 |
| CO4 | 6 | 8 | - | 5 |  |  | 19 |
| CO5 | 2 | 5 | 8 | 5 |  |  | 20 |
| CO6 | - | 1 | - | 8 |  |  | 9 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1302** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTORY AGRO-METEOROLOGY & CLIMATE CHANCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Expand the term NCMRWF. | | CO1 | U | 1 |
| 2. | \_\_\_\_\_\_is the imaginary lines joins the places having the same atmospheric pressure. | | CO1 | R | 1 |
| 3. | Brief about meteorological drought. | | CO1 | R | 1 |
| 4. | What is climate change? | | CO2 | R | 1 |
| 5. | Stratosphere layer having no storms or turbulence here to mix up the air, so cold, heavy air is at the bottom and warm, light air is at the top (True/False). | | CO2 | U | 1 |
| 6. | Define weather. | | CO2 | R | 1 |
| 7. | Give the different forms of precipitation. | | CO3 | U | 1 |
| 8. | Give the formula for photothermal unit. | | CO3 | R | 1 |
| 9. | Define optimum temperature. | | CO3 | U | 1 |
| 10. | Brief about land breeze. | | CO4 | U | 1 |
| 11. | Define Specific humidity. | | CO4 | U | 1 |
| 12. | Give the formula for GDD. | | CO4 | R | 1 |
| 13. | \_\_\_\_\_\_ is a line that in a given time joins points of equal rainfall on a map. | | CO5 | R | 1 |
| 14. | Expand WMO. | | CO5 | R | 1 |
| 15. | Give the different types of weather forecasting. | | CO6 | U | 1 |
| 16. | Expand IMD. | | CO6 | R | 1 |
| 17. | Define Hydro Meteorology. | | CO6 | U | 1 |
| 18. | The height of stratosphere layer from \_\_\_\_\_\_\_ to \_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 19. | List the three high clouds. | | CO2 | U | 1 |
| 20. | Expand FAO. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain about composition of atmosphere. | | CO2 | U | 5 |
| 22. | Discuss about impact of climate change in various agriculture crops. | | CO4 | U | 5 |
| 23. | List the tools used for weather forecasting and explain anyone tool in detail. | | CO2 | A | 5 |
| 24. | Define (i) Climate (ii) Climate variability (iii) Climate change  (iv) Weather (v) Ozone layer. | | CO6 | A | 5 |
| 25. | List the agroclimatic climatic zones of Tamil Nadu and explain anyone. | | CO5 | U | 5 |
| 26. | Explain about weather modification in the agriculture fields. | | CO3 | A | 5 |
| 27. | Define with diagram (i) Sea breeze (ii) land breeze (iii) Mountain wind (iv) valley wind. | | CO1 | R | 5 |
| 28. | Discuss about Northeast monsoon mechanism in India. | | CO3 | R | 5 |
| 29. | Explain the weather abnormalities. | | CO2 | R | 5 |
| 30. | Write the different process for transfer of heat. | | CO3 | U | 5 |
| 31. | Define Remote sensing and its application. | | CO5 | U | 5 |
| 32. | Define Relative humidity and explain temperature and relative humidity interaction. | | CO5 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss about types of meteorology with its scope and importance. | CO2 | U | 7.5 |
|  | b. | Discuss about Southwest monsoon mechanism in India. | CO3 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | List the different agroclimatic zones of India and explain. | CO3 | U | 7.5 |
|  | b. | Explain the different types of droughts. | CO3 | R | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain in detail about stratification of atmosphere with neat diagram. | CO1 | R | 7.5 |
|  | b. | Explain in detail about permanent wind and pressure belt of the earth with a neat diagram. | CO4 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the significance of agricultural metrology, climate and weather. |
| CO2 | Discuss the various atmospheric weather variables and its significance in crop production. |
| CO3 | Understand crop weather relationships for efficient crop production. |
| CO4 | Acquire knowledge on weather forecasting techniques and effect of climate change on crop  Production. |
| CO5 | Describe artificial rainmaking, precipitation, monsoons and its importance in Indian Agriculture. |
| CO6 | Discuss global warming, and its effect on regional and national agriculture. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 15.5 | 1 |  |  |  |  | 16.5 |
| CO2 | 7 | 14.5 | 5 |  |  |  | 26.5 |
| CO3 | 13.5 | 22 | 5 |  |  |  | 40.5 |
| CO4 | 1 | 8 | 7.5 |  |  |  | 16.5 |
| CO5 | 2 | 15 |  |  |  |  | 17 |
| CO6 | 1 | 2 | 5 |  |  |  | 8 |
|  | | | | | | | **125** |



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| **Course Code :** | **21AG1303** | **Duration :** | **3hrs** |
| **Course Name :** | **AGRICULTURAL MICROBIOLOGY** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **CO/BL** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | |
| 1. | Define transposans. | CO5 / R | 1 |
| 2. | What is a cosmid? | CO 5 / U | 1 |
| 3. | Name the three structural genes in lac operon. | CO5 / R | 1 |
| 4. | Differentiate between chemotrophs and autotrophs. | CO3 / An | 1 |
| 5. | What is meant by Pasteurization? | CO2 / A | 1 |
| 6. | Who is the father of Soil Microbiology? | CO1 / R | 1 |
| 7. | Give an example for endospore producing bacteria. | CO2 / R | 1 |
| 8. | The terminal electron acceptor in *Pseudomonas* sp is NO3. Identify the metabolic process. | CO 2 / An | 1 |
| 9. | Define generation time. | CO3 /U | 1 |
| 10. | Name any one key contribution of Louis Pasteur to the microbial world. | CO1 / E | 1 |
| 11. | List any two free living nitrogen fixers. | CO 6 / An | 1 |
| 12. | The optimum temperature of Psychrophilic bacteria. | CO4 / U | 1 |
| 13. | Define Biofuel. | CO4 / R | 1 |
| 14. | Differentiate between peritrichous and lophotrichous flagella. | CO2 / A | 1 |
| 15. | Give two examples of viral biopesticides. | CO6 /R | 1 |
| 16. | What are thermophiles? | CO 2 / U | 1 |
| 17. | Name an entomopathogenic fungi that controls *Aedes* mosquito species. | CO6 / R | 1 |
| 18. | The *cry* protein expressed in Bt maize is …………….. | CO6 / A | 1 |
| 19. | What is resolving power in microscope? | CO-2 / U | 1 |
| 20. | Define tyndalization. | CO1 / E | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Differentiate between Gram positive and Gram negative bacteria. | CO1 / An | 5 |
| 22. | Explain the nodulation process in legume-rhizobium symbiosis. | CO4 / U | 5 |
| 23. | Critically comment on the cell wall and membrane modifications of psychrophilic and thermophilic microbes. | CO2 / E | 5 |
| 24. | Explain viral biopesticides and their mode of action. | CO6 / U | 5 |
| 25. | Give the significant contribution of the following scientists: a) Louis Pasteur b) Robert Koch. | CO 1/ R | 5 |
| 26. | Explain carbon cycle and its contributions to soil fertility. | CO4 / A | 5 |
| 27. | Explain the structural components and its function in prokaryotic cells. | CO3 / R | 5 |
| 28. | Give a detailed account on transformation with an experiment to prove it. | CO5 / R | 5 |
| 29. | Define silage. Briefly explain the methods of fodder conservation. | CO6 / A | 5 |
| 30. | Explain the principle of fluorescent microscopy. | CO2 / U | 5 |
| 31. | Explain the factors affecting soil microbial activity. | CO3 / A | 5 |
| 32. | Briefly summarize the mRNA synthesis with a neat sketch. | CO5 / R | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Define conjugation. Explain the types of conjugation with a neat sketch. | CO5 / U | 7.5 |
| b. | Give a brief account on gene regulation –Lac operon. | CO5 / U | 7.5 |
|  |  |  |  |  |
| 34. | a. | Elaborate sulphur cycle and write its implications in soil fertility. | CO6 / U | 7.5 |
| b. | What are the different phases in a microbial growth curve? Discuss in detail with a neat sketch. | CO3 / U | 7.5 |
|  |  |  |  |  |
| 35. | a. | Define sterilization. Explain the various sterilization techniques in detail. | CO2 /E | 7.5 |
| b. | What is a diazotroph? Highlight the importance of biological nitrogen fixation in enhancing crop productivity. | CO4 / An | 7.5 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Comprehend the importance and role of microbes in agricultural production. |
| CO2 | Understand principles of microscopy, sterilization techniques and nutrient media preparation. |
| CO3 | Enumerate microbial load in soil and perform isolation, culturing and purification of microbes. |
| CO4 | Describe role of microbes in enhancing soil fertility. |
| CO5 | Analyze genetic improvement of crop plants and transformation methods using microbes. |
| CO6 | Apply knowledge and develop biofertilizers, biopesticides, biofuels, and biowaste degradation. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 6 | - | - | 5 | 2 | - | 13 |
| CO2 | 1 | 7 | 2 | 1 | 12.5 | - | 23.5 |
| CO3 | 5 | 8.5 | 5 | 1 | - | - | 19.5 |
| CO4 | 1 | 6 | 5 | 7.5 | - | - | 19.5 |
| CO5 | 12 | 16 | - | - | - | - | 28 |
| CO6 | 2 | 12.5 | 6 | 1 | - | - | 21.5 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1303** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL MICROBIOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The Ribonucleic Acid synthesis of eukaryotic cells is \_\_\_\_\_\_\_\_\_\_\_\_\_  A) in the ribosome B) in the mitochondria  C) in the cytoplasm D) in the nucleus | | CO1 | U | 1 |
| 2. | The structure of 'Prokaryotic DNA' is called \_\_\_\_\_\_\_\_\_\_\_\_  A) Ribosome B) Cytoplasm  C) Nucleoid D) Plasma membrane | | CO1 | R | 1 |
| 3. | From which structure is a mesosome derived from? A) Plasmid B) Cell wall C) Ribosome D) Cell membrane | | CO1 | An | 1 |
| 4. | What are the subunits of prokaryotic ribosomes? A) 50S, 30S B) 60S, 40S C) 70S, 30S D) 60S, 30S | | CO2 | A | 1 |
| 5. | **What is a cluster of polar flagella called?**  A) Petritrichous B) Monotrichous  C) Amphitrichous D) Lophotrichous | | CO2 | R | 1 |
| 6. | The portion of the growth curve where rapid growth of bacteria is observed is known as \_\_\_\_\_\_\_\_\_\_\_\_ A) Lag phase B) Logarithmic phase C) Stationary phase D) Decline phase | | CO3 | R | 1 |
| 7. | The generation time for *E. coli* is \_\_\_\_\_\_\_\_ A) 20 minutes B) 35 minutes C) 2 minutes D) 13 minutes | | CO3 | U | 1 |
| 8. | The Nitrifying bacteria are \_\_\_\_\_\_\_\_\_\_\_  A) Photoautotroph B) Chemoautotroph C) Nitrotroph D) Organotroph | | CO3 | U | 1 |
| 9. | **This factor contributes to the carbon cycle \_\_\_\_\_\_\_\_\_\_\_**  A) fossil fuel combustion B) respiration  C) photosynthesis D) all of these | | CO4 | R | 1 |
| 10. | In carbon cycle flow of energy is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A) Bidirectional B) Linear C) Cyclic D) Irreversible | | CO4 | E | 1 |
| 11. | Cysteine breaks down in presence of cysteine desulfurase to give \_\_\_\_\_\_\_\_\_ A) Oxaloacetic acid B) Sulphuric acid C) Pyruvic acid D) Glyoxalate | | CO4 | A | 1 |
| 12. | Sulphates are reduced to hydrogen sulphide by \_\_\_\_\_\_\_\_\_\_\_\_ A) *Desulfotomaculum* sp. B) *Thiobacillus thiooxidans* C) Photosynthetic sulfur bacteria D) *Rhodospirillum* | | CO4 | R | 1 |
| 13. | The function of ligase is to \_\_\_\_\_\_\_\_\_\_\_\_  A) rejoin segments of DNA B) make longitudinal cuts in DNA  C) synthesize cDNA D) break down ligaments | | CO5 | R | 1 |
| 14. | The coding DNA strand that complements mRNA AUGCGCGAC is \_\_\_\_\_\_\_  A) UACGCUCUG B) GTCTCGCAT  C) TACGCTCTG D) DNA cannot complement mRNA | | CO5 | C | 1 |
| 15. | **A single-stranded, radio labeled molecule of nucleic acids is called \_\_\_\_\_\_\_\_\_**  A) plasmid B) vector  C) probe D) selectable marker | | CO5 | R | 1 |
| 16. | **Which of the following gene helps in identifying transformed cells?**  A) plasmid B) selectable marker  C) structural gene D) vector | | CO5 | U | 1 |
| 17. | **The DNA molecule used for integrating foreign gene for cloning is called \_\_\_\_\_\_\_\_\_\_\_\_\_**  A) vector B) carrier  C) template D) transformer | | CO5 | R | 1 |
| 18. | [Symbiotic nitrogen fixation in root nodules of some legumes is caused by \_\_\_\_\_\_\_\_\_\_\_\_](https://www.studyadda.com/question-bank/neet/biology/domestication-of-animals-for-enhancement-of-food-production/biofertilizer/1590)  A) Nitrosomonas B) Rhizobium  C) Azotobacter D) Nitrobacter | | CO6 | A | 1 |
| 19. | [Azolla possesses symbiotic association with \_\_\_\_\_\_\_\_\_\_\_\_\_](https://www.studyadda.com/question-bank/neet/biology/domestication-of-animals-for-enhancement-of-food-production/biofertilizer/1590)  A) Anabaena B) Nostoc  C) Azospirillum D) Rhizobium | | CO6 | R | 1 |
| 20. | \_\_\_\_\_\_\_\_\_\_\_\_ Process is the main pathway for degradation of bioorganic compounds. A) catabolic B) anabolic C) catalytic D) gluconeogenesis | | CO6 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate the Eukaryotic and Prokaryotic Flagella. | | CO1 | U | 5 |
| 22. | Explain the type of flagella with neat diagram. | | CO1 | A | 5 |
| 23. | Write short note on physical sterilization method. | | CO2 | R | 5 |
| 24. | Explain the growth phases of bacteria with neat diagram. | | CO3 | R | 5 |
| 25. | Explain the Carbon cycle. | | CO4 | An | 5 |
| 26. | Explain the Phosphorus cycle. | | CO4 | An | 5 |
| 27. | Explain the different types of culture media. | | CO4 | U | 5 |
| 28. | Explain the structure and function uses of EcoR1 plasmid. | | CO5 | R | 5 |
| 29. | Give details about the prokaryotic transposon. | | CO5 | U | 5 |
| 30. | Explain the characteristic features and importance of *Azolla.* | | CO6 | R | 5 |
| 31. | Difference between phyllosphere and rhizosphere. | | CO6 | U | 5 |
| 32. | Explain different type of biofertilizers and biopesticides with example. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Difference between Prokaryotic and Eukaryotic microbes. | CO1 | U | 15 |
|  | b. | Explain the bacterial cell structure with neat diagram. | CO2 | An | 15 |
|  |  |  |  |  |  |
| 34. | a. | Briefly explain the biological nitrogen fixation - Symbiotic, Associative and Asymbiotic. | CO3 | An | 15 |
|  | b. | Explain the steps involved in the nitrogen cycle. | CO4 | An | 15 |
|  |  |  |  |  |  |
| 35. | a. | Explain the transformation, conjugation and transduction process in bacterial cell with suitable diagram. | CO5 | R | 15 |
|  | b. | Explain the brief procedure for silage making. | CO6 | R | 15 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Comprehend the importance and role of microbes in agricultural production. |
| CO2 | Understand principles of microscopy, sterilization techniques and nutrient media preparation. |
| CO3 | Enumerate microbial load in soil and perform isolation, culturing and purification of microbes. |
| CO4 | Explain the role of microbes in enhancing soil fertility. |
| CO5 | Employ genetic transformation methods using microbes in crop improvement. |
| CO6 | Explore and develop biofertilizers, biopesticides and biofuels. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 21 | 5 | 1 | - | - | 28 |
| CO2 | 6 | - | 1 | - | - | - | 7 |
| CO3 | 6 | 2 | - | 15 | - | - | 23 |
| CO4 | 2 | 5 | 1 | 10 | 1 | - | 19 |
| CO5 | 23 | 6 | - | - | - | 1 | 30 |
| CO6 | 11 | 6 | 1 | - | - | - | 18 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1351** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF PLANT PATHOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Sulphur fungicides is used for the effective management of ---------------- disease. | | CO6 | R | 1 |
| 2. | Name the fungus that produces naked asci -------------. | | CO3 | U | 1 |
| 3. | The resistance that is controlled by one or two genes is termed as -------------. | | CO5 | R | 1 |
| 4. | Cell wall of Oomycetous fungi is made up of --------------. | | CO2 | U | 1 |
| 5. | Write an example for total stem parasite ----------------. | | CO1 | R | 1 |
| 6. | Bacteria that contain tuft of flagellum at both end is called as -------------. | | CO2 | R | 1 |
| 7. | Write an example for acervuli producing fungi ---------------. | | CO3 | R | 1 |
| 8. | Candidatus Phytoplasma is sensitive to ----------- antibiotic. | | CO6 | R | 1 |
| 9. | Tinsel and whiplash type of flagella is produced by ------------. | | CO3 | A | 1 |
| 10. | Whiptail of cauliflower is due to -------------- deficiency. | | CO1 | R | 1 |
| 11. | Sexual spore of Basidiomycetes is ----------------. | | CO3 | R | 1 |
| 12. | Vascular wilt of cotton is caused by ---------------. | | CO1 | A | 1 |
| 13. | Cite the causal organism for fire blight of Apple ----------------. | | CO1 | R | 1 |
| 14. | The chemical substances which kills the fungi is known as ---------------. | | CO6 | R | 1 |
| 15. | Write an example for gram positive bacteria -------------. | | CO1 | R | 1 |
| 16. | Who is the Father of Plant Pathology in India ----------------. | | CO2 | R | 1 |
| 17. | Complex flask shaped asexual fruiting body is called as --------------. | | CO3 | U | 1 |
| 18. | Recall an example for resting spore -----------------. | | CO3 | A | 1 |
| 19. | Solar heat treatment technique is used for the management of -------------- disease in Wheat. | | CO6 | U | 1 |
| 20. | Total number of spore stages in rust fungi is -----------. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Classify the bacteria based on flagella with suitable diagrams. | | CO2 | A | 5 |
| 22. | Differentiate vertical and horizontal resistance. | | CO5 | U | 5 |
| 23. | Explain the classification of chasmothecium based on appendages and number of asci with suitable diagram. | | CO3 | R | 5 |
| 24. | Explain the different types of phanerogamic parasites with suitable diagram | | CO1 | A | 5 |
| 25. | Outline the Koch’s Postulates. | | CO2 | E | 5 |
| 26. | Define the following  a.Pathogen, b.Hyphae c. Inoculum potential d. Virulence and e. Symptom. | | CO2 | A | 5 |
| 27. | List out the different steps in pathogenesis. | | CO1 | A | 5 |
| 28. | Explain the Asexual fruiting bodies and Asexual spores with suitable diagram. | | CO3 | E | 5 |
| 29. | Differentiate between macrocyclic rust and microcyclic rust with a suitable example. | | CO1 | A | 5 |
| 30. | Briefly discuss any five types of symptoms produced by fungi. | | CO2 | An | 5 |
| 31. | Discuss the classification of fungicides based on general use. | | CO6 | U | 5 |
| 32. | Write the causal organism for the following diseases; a. Angular leaf spot of Cotton, b. Late blight of Potato, c. Downy Mildew of Pearl millet, d. Brown leaf spot of Rice, e. Fire blight of Apple. | | CO1 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write the contributions of the following scientists  1. Anton de Bary 2. Robert Koch 3. J.E. Vanderplank 4. E. J. Butler 5. M. W. Beijerinck. | CO2 | E | 8 |
|  | b. | How do plant pathogens get dispersed? | CO4 | A | 7 |
| 34. | a. | Summarize the taxonomic position, symptom and life cycle of *Phytophthora infestans.* | CO2 | A | 8 |
|  | b. | Classification of plant diseases based on the occurrence and severity. | CO5 | R | 7 |
| 35. | a. | Summarize the taxonomic position, symptom and life cycle of Black stem rust of Wheat. | CO2 | An | 8 |
|  | b. | List out the principles of crop disease management and elaborate exclusion. | CO6 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the factors responsible for disease development. |
| CO2 | Understand the importance of different plant pathogens with their characteristics and classification. |
| CO3 | Recall the reproduction, survival and transmission of plant pathogens. |
| CO4 | Outline the mode of dispersal, role of enzymes and toxins in disease development. |
| CO5 | Analyze defense mechanism in plants and the epidemiological factors. |
| CO6 | Apply knowledge on plant disease management. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 4 | - | 16 | 5 | - | - | 25 |
| CO2 | 2 | 2 | 18 | 13 | 13 | - | 48 |
| CO3 | 7 | 2 | 2 | - | 5 | - | 16 |
| CO4 | - | - | 7 | - | - | - | 7 |
| CO5 | 8 | 5 | - | - | - | - | 13 |
| CO6 | 3 | 6 | 7 | - | - | - | 16 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1351** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF PLANT PATHOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Who is father of mycology? | | CO1 | R | 1 |
| 2. | Define Pathogenicity. | | CO1 | R | 1 |
| 3. | List out four components tetrahedron. | | CO1 | U | 1 |
| 4. | The entire body of the fungus is known as \_\_\_\_\_\_\_\_\_\_\_. | | CO1 | An | 1 |
| 5. | \_\_\_\_\_\_\_\_\_\_\_ is the smallest infectious organism. | | CO1 | An | 1 |
| 6. | Give any two example for phanerogamic plant parasite. | | CO2 | A | 1 |
| 7. | Define Phytotoxin. | | CO4 | R | 1 |
| 8. | Write about Pandemic disease in plant pathology and give any one example. | | CO2 | C | 1 |
| 9. | List out any two point about abiotic factors responsible for disease development. | | CO2 | U | 1 |
| 10. | List out types of resting bodies in fungi. | | CO3 | U | 1 |
| 11. | Define Mycelium. | | CO3 | C | 1 |
| 12. | List out types of sexual spores in fungi. | | CO3 | E | 1 |
| 13. | Define Hypertrophy and Hyperplasia. | | CO2 | R | 1 |
| 14. | Give an example for pear shaped sporangia with characteristic papillae. | | CO2 | A | 1 |
| 15. | Write causal organism for club root diseases of cabbage. | | CO2 | C | 1 |
| 16. | Write causal organism for Black mold or Fruit rot disease of Jackfruit. | | CO2 | C | 1 |
| 17. | Define Muriform conidia with neat diagram. | | CO3 | R | 1 |
| 18. | List out any two systemic fungicide. | | CO6 | A | 1 |
| 19. | List out any two antifungal antibiotics. | | CO6 | E | 1 |
| 20. | List out any two plant viral diseases with vector. | | CO5 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain about Koch’s postulate. | | CO1 | R | 5 |
| 22. | Write elaborately sexual fruiting bodies and spores in fungi. | | CO3 | C | 5 |
| 23. | Describe stages in Pathogenesis. | | CO4 | R | 5 |
| 24. | Outline the classification Basidiomyctoa. | | CO2 | A | 5 |
| 25. | Draw the life cycle of Puccinia and its systematic position. | | CO3 | A | 5 |
| 26. | Explain about general characters of Oomycota and life cycle of Downy mildeaw disease in sorghum. | | CO2 | R | 5 |
| 27. | Write the symptoms of *Rhizopus* sp and *Synchtrium* sp with diagram. | | CO2 | C | 5 |
| 28. | Write about general characters of Phytoplasma and explain about any two phytoplasma disease. | | CO2 | C | 5 |
| 29. | Write about general morphology characters of Nematode with diagram. | | CO5 | C | 5 |
| 30. | Explain about role of growth regulators in disease development. | | CO4 | R | 5 |
| 31. | Describe Defense mechanism in plants. | | CO5 | R | 5 |
| 32. | Outline the classification of systemic fungicides and their mode of action. | | CO6 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Classification of Plant diseases. | CO1 | A | 8 |
|  | b. | Write elaborately Asexual fruiting bodies in fungi. | CO2 | C | 7 |
| 34. | a. | Draw the life cycle of *Plasmodiophora brassicae* and write its systematic position. | CO3 | An | 10 |
|  | b. | Write about Rolling circle replication in virus with neat diagram. | CO4 | C | 5 |
| 35. | a. | Elaborately discuss about Bacterial Reproduction. | CO5 | E | 7 |
|  | b. | Define antibiotics and explain it. | CO6 | R | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the factors responsible for disease development. |
| CO2 | Understand the importance of different plant pathogens with their characteristics and classification. |
| CO3 | Recall the reproduction, survival and transmission of plant pathogens. |
| CO4 | Outline the mode of dispersal, role of enzymes and toxins in disease development. |
| CO5 | Analyze defense mechanism in plants and the epidemiological factors. |
| CO6 | Apply knowledge on plant disease management. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 7 | 1 | 8 | 2 | - | - | 18 |
| CO2 | 6 | 1 | 7 | - | - | 20 | 34 |
| CO3 | 1 | 1 | 5 | 10 | 1 | 6 | 24 |
| CO4 | 11 | - | - | - | - | 5 | 16 |
| CO5 | 5 | - | - | 1 | 7 | 5 | 18 |
| CO6 | 8 | - | 6 | - | 1 | - | 15 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1451** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTORY SOIL AND WATER CONSERVATION ENGINEERING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The soil erosion due to human made activities is called ……… | | CO1 | R | 1 |
| 2. | Write total area affected by erosion in India. | | CO1 | R | 1 |
| 3. | The advanced stage of rill erosion is ……… | | CO2 | R | 1 |
| 4. | Write the USLE with notations. | | CO2 | U | 1 |
| 5. | What are the major rainfall characteristics influencing runoff from watersheds? | | CO2 | U | 1 |
| 6. | In splash erosion, the raindrop energy acts in the form of ………… | | CO2 | U | 1 |
| 7. | Define Erosivity. | | CO2 | R | 1 |
| 8. | Distinguish between active gully and inactive gully. | | CO2 | U | 1 |
| 9. | Define pinnacle erosion. | | CO1 | R | 1 |
| 10. | Define surface creep in wind erosion. | | CO5 | R | 1 |
| 11. | What are the major tree species introduced to control wind erosion? | | CO6 | A | 1 |
| 12. | Distinguish between suspended load and Bed load movements. | | CO2 | An | 1 |
| 13. | What is a terrace? | | CO2 | U | 1 |
| 14. | What are the surface roughness factors influencing soil erosion by wind? | | CO5 | U | 1 |
| 15. | What are the various causes of soil degradation? | | CO2 | U | 1 |
| 16. | Distinguish between contour strip cropping and buffer strip cropping systems. | | CO1 | R | 1 |
| 17. | What is mulch tillage? How does it influence soil erosion? | | CO2 | R | 1 |
| 18. | What are the common types of bench terraces? | | CO2 | R | 1 |
| 19. | Differentiate between contour bund and graded bund. | | CO3 | U | 1 |
| 20. | Where contour stone wall construction is adopted? | | CO3 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss about the various stages of gully development with neat sketches. | | CO2 | An | 5 |
| 22. | Compute the annual soil loss by using USLE for the following data:  Erosion index =250J/ha; contour cultivated area; Length of the field = 110 metres; Slope of the field = 5%; 65% silt + very fine stand; 5% sand; 3% organic matter; very fine granular structure; moderate permeability; Crop management factor = 0.35 and Conservation practice factor =0.5. | | CO2 | E | 5 |
| 23. | How gullies are classified? Discuss. | | CO2 | A | 5 |
| 24. | What are the permanent gully control structures? Explain anyone with a neat sketch. | | CO2 | R | 5 |
| 25. | Discuss about ill effects of soil erosion. | | CO1 | U | 5 |
| 26. | Brief about agronomical measures to control soil erosion. | | CO2 | R | 5 |
| 27. | Explain the step wise procedure to be followed in the design of contour bunds. | | CO2 | R | 5 |
| 28. | Explain the step wise procedure to be followed in the design of graded bunds. | | CO2 | R | 5 |
| 29. | Briefly explain the mechanics of soil erosion by water. | | CO1 | U | 5 |
| 30. | Briefly explain the mechanics of wind erosion. | | CO5 | U | 5 |
| 31. | Discuss about wind erosion measures with neat sketches. | | CO6 | A | 5 |
| 32. | Explain the various water harvesting techniques with neat sketches. | | CO4 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss in detail with neat sketches about temporary gully control measures. | CO2 | U | 7.5 |
|  | b. | Explain the various factors affecting soil erosion by wind. | CO5 | R | 7.5 |
| 34. | a. | Describe with neat sketches of bench terraces adopted in the hilly regions. | CO2 | A | 7.5 |
|  | b. | Explain the various factors affecting soil erosion by water. | CO1 | A | 7.5 |
| 35. | a. | Explain with neat sketches about multislot divisor unit for measuring soil loss. | CO3 | An | 7.5 |
|  | b. | Design of wind breaks and shelter belts. Discuss. | CO4 | E | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** | | | | | | | | |
| CO1 | 1. Understand basic concepts of soil and water conservation. | | | | | | | | |
| CO2 | 1. Explain the gully erosion control measures. | | | | | | | | |
| CO3 | 1. Measure the soil loss using different techniques. | | | | | | | | |
| CO4 | 1. Explain the water harvesting techniques. | | | | | | | | |
| CO5 | 1. Understand the mechanics of wind erosion. | | | | | | | | |
| CO6 | 1. Explain the different control measures of wind erosion. | | | | | | | | |
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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | | |
| **CO / P** | | | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | | | 4 | 10 | 7.5 | - | - | - | 21.5 |
| CO2 | | | 24 | 13.5 | 12.5 | 6 | 5 | - | 61.0 |
| CO3 | | | - | 2 | - | 7.5 | - | - | 9.5 |
| CO4 | | | - | - | - | 5 | 7.5 | - | 12.5 |
| CO5 | | | 8.5 | 6 | - | - | - | - | 14.5 |
| CO6 | | | - | - | 6 | - | - | - | 6.0 |
|  | | | | | | | | | **125.0** |



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| **Course Code** | **21AG1451** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTORY SOIL AND WATER CONSERVATION ENGINEERING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Gully erosion is the advanced stage of \_\_\_\_\_\_\_\_\_\_ erosion.  a) Wind b) Water c) Rill d) Splash | | CO2 | R | 1 |
| 2. | The bench terrace is applied in areas of slope higher than \_\_\_\_\_\_\_\_.  a) One percent b) 5 percent c) 15 percent d) 10 percent | | CO6 | An | 1 |
| 3. | The rain has \_\_\_\_\_\_\_\_\_\_\_\_ more kinetic energy than runoff.  a) 256 times b) 196 times c) 106 times d) 356 times | | CO1 | An | 1 |
| 4. | Soil loss is more sensitive to \_\_\_\_\_\_\_\_  a) Slope length b) Slope steepness c) Slope direction d) Normal factor | | CO3 | U | 1 |
| 5. | Contour bunds are preferred in \_\_\_\_\_\_\_rainfall area.  a) high b) low c) very high d) medium | | CO4 | R | 1 |
| 6. | \_\_\_\_\_\_\_\_\_\_\_ is referred as movement of soil particles in a series of bounces over a soil surface.  a) Saltation b) Creep c) Suspension d) Sand dunes | | CO1 | U | 1 |
| 7. | Graded bund is adopted in areas where rainfall more than \_\_\_\_\_\_\_.  a) 30 cm b) 75 cm c) 60 cm d) 55 cm | | CO6 | An | 1 |
| 8. | Soil erosion is more in  a) Sandy soil b) Silty soil c) Clay loam d) Peaty soil | | CO1 | R | 1 |
| 9. | Engineering control measures of soil erosion include  a) Wind break b)Terraces c) Bunds d) Bunds and Terraces | | CO4 | A | 1 |
| 10. | When trees and shrubs are planted in long rows at regular intervals, they are described as  a) Wind breaks b) Shelter belts c) Basin listers d) Soil binders | | CO6 | R | 1 |
| 11. | ……………… is the practice of maintaining crop residues at the ground surface offers good protection from Soil Blowing. | | CO5 | U | 1 |
| 12. | In Conservation tillage, …………. crop residue left after planting. | | CO4 | A | 1 |
| 13. | The gully cuts to the C-horizon and the parent material are removed as  ……….. | | CO2 | An | 1 |
| 14. | The portion of ……………. % of the soil erosion by wind takes place in saltation | | CO5 | E | 1 |
| 15. | Universal soil loss equation was proposed by …………in 1959 | | CO3 | R | 1 |
| 16. | ………….is considered as Third Phase of Soil Erosion. | | CO1 | U | 1 |
| 17. | ………… gullies are formed in areas where the subsoil is more resistant to erosion | | CO2 | R | 1 |
| 18. | Dune means……………. | | CO5 | R | 1 |
| 19. | …………is wider barrier than wind break, constructed by more than two rows, usually at right angles to the direction of prevailing wind. I | | CO5 | U | 1 |
| 20. | Universal soil loss equation (USLE) is P = ……………… | | CO3 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the Causes of Soil Erosion. | | CO1 | U | 5 |
| 22. | State Wind Break and Shelter belts. | | CO6 | R | 5 |
| 23. | Explain Gully Erosion. What are the processes involved in Gully Erosion? | | CO2 | U | 5 |
| 24. | List out the Water Harvesting Techniques in Hilly Slopes and Explain them. | | CO4 | R | 5 |
| 25. | Abbreviate USLE and Discuss the Limitations. | | CO3 | U | 5 |
| 26. | Define Wind Erosion. Write down the Mechanics of Wind Erosion. | | CO5 | R | 5 |
| 27. | What are the types of Bench Terraces? Explain them with neat sketch. | | CO4 | A | 5 |
| 28. | Write down the uses of USLE. | | CO3 | A | 5 |
| 29. | Explain in brief about sand dunes and List out its classification. | | CO6 | U | 5 |
| 30. | Interpret the Stages of Gully Development. | | CO2 | A | 5 |
| 31. | Discuss about the Evil Effects of Water Erosion. | | CO1 | U | 5 |
| 32. | List out the factors affecting wind erosion and state them in brief Manner. | | CO5 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | (i) Define the energy involved in part of soil erosion.  (ii)List out the factors affecting soil erosion. Explain them. | CO1 | R | 4  4 |
|  | b. | Interpret with a brief explanation about water harvesting techniques. | CO4 | A | 7 |
| 34. | a. | Interpret in detail about the USLE. | CO3 | A | 8 |
|  | b. | Sketch out the Classification on Gullies with brief explanation. | CO2 | A | 7 |
| 35. | a. | Discuss in detail about the evil effects of wind erosion. | CO5 | U | 6 |
|  | b. | State about control measures of wind erosion. | CO6 | R | 9 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand basic concepts of soil and water conservation |
| CO2 | Explain the gully erosion control measures |
| CO3 | Measure the soil loss using different techniques |
| CO4 | Explain the water harvesting techniques |
| CO5 | Understand the mechanics of wind erosion |
| CO6 | Explain the different control measures of wind erosion |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 8 | 12 | - | 1 | - | - | 21 |
| CO2 | 2 | 5 | 12 | 1 | - | - | 20 |
| CO3 | 1 | 6 | 14 | - | - | - | 21 |
| CO4 | 6 | - | 15 | - | - | - | 21 |
| CO5 | 11 | 9 | - | - | 1 | - | 21 |
| CO6 | 14 | 5 | - | 2 | - | - | 21 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG1501** | **Duration :** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF PLANT BIOCHEMISTRY AND BIOTECHNOLOGY** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | Expand RADP. | | | CO 6 | R | 1 |
| 2. | List one keto sugars. | | | CO 1 | R | 1 |
| 3. | The variation seen in tissue culture plants is called \_\_\_\_\_\_\_\_\_\_\_. | | | CO 4 | R | 1 |
| 4. | The unorganized mass of cells is called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 4 | R | 1 |
| 5. | The unusual fatty acid present in castor is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 1 | R | 1 |
| 6. | The tissue or small part of plant used for micro propagation is called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 5 | R | 1 |
| 7. | In Fatty acid biosynthesis, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ moelcule carry the fatty acid across membrane. | | | CO 2 | R | 1 |
| 8. | The scientist who coined the term Biochemistry is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 1 | R | 1 |
| 9. | Growing small parts of plant in vitro under controlled conditions is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 5 | R | 1 |
| 10. | State an enzyme that catalysis reduction reactions. | | | CO 1 | R | 1 |
| 11. | The nucleic acid associated with protein synthesis is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 1 | R | 1 |
| 12. | Lock and Key model was proposed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 1 | R | 1 |
| 13. | Food source rich in omega 3 fatty acid is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 3 | R | 1 |
| 14. | The bond present in DNA is called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 2 | R | 1 |
| 15. | Name a chemical used for sterilizing explants. | | | CO 4 | R | 1 |
| 16. | Dulcitol is derived from \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 3 | R | 1 |
| 17. | Cryopreservation is the process of storing tissues under \_\_\_\_\_\_\_\_\_\_\_\_\_\_ temperature | | | CO 6 | R | 1 |
| 18. | The process of saturation of unsaturated fatty acid by addition of Hydrogen is called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 2 | R | 1 |
| 19. | The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cholesterol is bad for heart | | | CO 3 | R | 1 |
| 20. | The gelling agent used in tissue culture media is \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO 5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Discuss the Induced fit model of enzyme action. | | | CO 1 | U | 5 |
| 22. | List the enzyme classification based on their functions. | | | CO 1 | U | 5 |
| 23. | Differentiate saturated and unsaturated fatty acid. | | | CO 1 | An | 5 |
| 24. | Describe the DNA finger printing technique. | | | CO 6 | U | 5 |
| 25. | Explain the TCA cycle. | | | CO 2 | U | 5 |
| 26. | Differentiate DNA and RNA with five points. | | | CO 1 | An | 5 |
| 27. | Describe the beta oxidation process. | | | CO 2 | U | 5 |
| 28. | Explain the properties of water. | | | CO 1 | U | 5 |
| 29. | Discuss the steps in micro propagation. | | | CO 5 | U | 5 |
| 30. | Discuss the use of biomolecules in Agriculture, food and medicine. | | | CO 3 | U | 5 |
| 31. | Describe the nomenclature and types of restriction endonucleases. | | | CO 6 | U | 5 |
| 32. | Explain the different sterilization techniques used in tissue culture. | | | CO 4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Explain oxidative phosphorylation. | CO 2 | U | 5 |
|  | | b | Classify Carbohydrates based on number of carbon atoms and number of sugar molecules. | CO 1 | U | 10 |
| 34. | | a. | Explain the PCR technique. | CO 6 | U | 9 |
|  | | b. | Discuss the different sterilization techniques followed in plant tissue culture. | CO 5 | U | 6 |
| 35. | | a. | Enumerate the importance of Biochemistry. | CO 3 | U | 6 |
|  | | b. | Discuss the different methods of protoplast fusion techniques. | CO 4 | U | 9 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the Uses, structure and classification of biomolecules. |
| CO2 | Discuss the various metabolic processes and its integration. |
| CO3 | Understand the importance of biomolecules in medicine, agriculture, pharmaceuticals and ethics. |
| CO4 | Describe the concepts in plant Biotechnology. |
| CO5 | Summaries the steps in micropropagation and in other plant cultures. |
| CO6 | Understand the different techniques in genetic engineering. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 6 | 25 | - | 10 | - | - | 41 |
| CO2 | 3 | 15 | - |  |  |  | 18 |
| CO3 | 3 | 11 |  |  | - | - | 14 |
| CO4 | 3 | 14 |  | - |  |  | 17 |
| CO5 | 3 | 11 | - | - | - | - | 14 |
| CO6 | 2 | 19 | - | - | - | - | 21 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code:** | **21AG1503** | **Duration :** | **3hrs** |
| **Course Name :** | **FUNDAMENTALS OF CROP PHYSIOLOGY** | **Max. Marks :** | **100** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q.**  **No.** | **Questions** | **CO**  **/ BL** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | |
| 1. | Hill reaction is also called as ----------. | CO4 / U | 1 |
| 2. | The guttation occurs only through ----------. | CO3 / R | 1 |
| 3. | Photosynthetically active radiation wavelength ranges from ------------. | CO4 / A | 1 |
| 4. | -------- is called as an necessary evil. | CO3 / R | 1 |
| 5. | The chloroplast is filled with a hydrophilic matrix called as ----------------  embedded with grana. | CO1 / A | 1 |
| 6. | Name a reflective type of anti-transpirant. | CO3 / R | 1 |
| 7. | The die back of citrus is due to deficiency. | CO3 / R | 1 |
| 8. | Water potential of pure water is ----------------. | CO2 / An | 1 |
| 9. | Movement of molecules or ions from a region of higher concentration to a  region of lower concentration is known as ----------------. | CO2 / U | 1 |
| 10. | The number of oxygen molecules released per photon of light in photosynthesis  is called as………………… | CO4 / A | 1 |
| 11. | Light energy is converted into energy during photosynthesis. | CO2 / U | 1 |
| 12. | The leaf area is expressed as per leaf. | CO5 / R | 1 |
| 13. | The infoldings of the inner membrane of mitochondria are called ------------. | CO1 / A | 1 |
| 14. | Solute potential is also known as potential. | CO2 / R | 1 |
| 15. | Expand DPD. | CO2 / U | 1 |
| 16. | ------------------------ deficiency causes Hen and chicken in grapes. | CO3 / R | 1 |
| 17. | The practice of growing plants in nutrient enriched water without soil is called  as soil less growth or\_\_\_\_\_\_\_\_\_\_\_\_. | CO3 / U | 1 |
| 18. | Photosynthetic efficiency is higher in plants. | CO4 / A | 1 |
| 19. | Green plastids are also known as -----------------. | CO4 / R | 1 |
| 20. | Khaira disease in rice is caused by ---------------. | CO3 / R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Describe the factors affecting transpiration. | CO3/An | 5 |
| 22. | Write short notes on transpiration and anti-transpirants. | CO3 / A | 5 |
| 23. | Write short notes on physiological effects of cytokinin. | CO6 / A | 5 |
| 24. | Explain C4 cycle or Hatch and Slack pathway. | CO4 / U | 5 |
| 25. | Write short notes on distribution of stomata with example and draw the  structure of stomata. | CO2 / R | 5 |
| 26. | Write short notes on Growth analysis. | CO5 /An | 5 |
| 27. | Explain water potential, its units and its components. | CO2 / U | 5 |
| 28. | Write short notes on nutritional disorders, visual symptoms and control  measures of macro nutrients. | CO3 / U | 5 |
| 29. | Explain the mechanism of respiration with respect to glycolysis. | CO5 / A | 5 |
| 30. | Write short notes on photosynthetic pigments. | CO4 / R | 5 |
| 31. | Explain the pathways through which water enters into the plant. | CO2 / A | 5 |
| 32. | Explain the five categories of water depending upon their availability to plants. | CO2 / A | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Explain the theories for mechanism of stomatal movement. | CO2 / U | 8 |
| b. | With neat diagram explain the structure and functions of plant cell  Organelles. | CO1 / R | 7 |
|  |  |  |  |  |
| 34. | a. | Explain cyclic and non-cyclic photophosphorylation. | CO4 / A | 8 |
| b. | Explain the dark reaction of Photosynthesis. | CO4 / U | 7 |
|  |  |  |  |  |
| 35. | a. | Explain the methods of absorption of minerals in plants. | CO3 / U | 7 |
| b. | Explain in detail the mode of water absorption by the plants. | CO2 / U | 8 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the physiology of plant tissues and cells. |
| CO2 | Remember water movement in plant systems like diffusion and osmosis. |
| CO3 | Apply the concept of water relations, mineral uptake in the field of agriculture. |
| CO4 | Summarize the various physiological processes. |
| CO5 | Measure and analyze the physiological parameters of crops. |
| CO6 | Practice the use of growth regulators correctly to solve physiological problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 7 | - | 2 | - | - | - | 9 |
| CO2 | 6 | 24 | 10 | 1 | - | - | 41 |
| CO3 | 6 | 13 | 5 | 5 | - | - | 29 |
| CO4 | 6 | 13 | 11 | - | - | - | 30 |
| CO5 | 1 | - | 5 | 5 | - | - | 11 |
| CO6 | - | - | 5 | - | - | - | 5 |
| **Total** | 26 | 50 | 38 | 11 | - | - | **125** |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL



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| --- | --- | --- | --- |
| **Course Code** | **21AG1503** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF CROP PHYSIOLOGY** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Which type of tissue has lignified cell walls?   1. Parenchyma B) Collenchyma   C) Sclerenchyma D) Cambium | | CO1 | U | 1 |
| 2. | The plant tissue become woody by a process of \_\_\_\_\_\_\_\_\_\_\_   1. Suberisation B) Pectification   C) Calcification D) Lignifications | | CO1 | R | 1 |
| 3. | Most metabolism of the plants is carried in tissue \_\_\_\_\_\_\_\_\_\_\_   1. Phloem B) Collenchymas   C) Meristem D) Parenchymas | | CO1 | A | 1 |
| 4. | Which of the following does not affect the rate of diffusion? A) Temperature B) Pressure C) ATP available D) Concentration gradient | | CO2 | R | 1 |
| 5. | **Transpiration is regulated by the movements of \_\_\_\_\_\_\_\_\_\_**  A) Parenchyma cells B) Guard cells  C) Epithelial cells D) None of the above | | CO2 | U | 1 |
| 6. | **The movement of materials from the leaves to other tissues of the plant is called \_\_\_\_\_\_\_\_\_**  A) Tropic movement B) Guttation  C) Transpiration D) Translocation | | CO2 | An | 1 |
| 7. | Nitrate reductase system in which element is major component?  A) Mo B) N  C) H D) None of the above | | CO3 | R | 1 |
| 8. | Which element is essential for activating the enzyme but not a part of enzyme?  A) Mn B) Mg  C) K D) Co | | CO3 | R | 1 |
| 9. | In leguminous plants leghemoglobin protects \_\_\_\_\_ activity  A) Nitrogenase B) Protiase  C) Nitrate reductase D) Both A and B | | CO3 | R | 1 |
| 10. | Which of the Following is Known as a Hatch-slack Pathway?   1. C2 Pathway B) C3 Pathway   C) C4 Pathway D) C5 Pathway | | CO4 | U | 1 |
| 11. | Which Metabolic Pathway Produces Carbohydrate?  A) Glycolysis B) Krebs cycle  C) Cyclic electron pathway D) Calvin cycle | | CO4 | A | 1 |
| 12. | The Hill Reaction Takes Place in \_\_\_\_\_\_\_\_\_\_  A) Stroma B) Grana of chloroplast  C) Both a & b D) None of the above | | CO4 | E | 1 |
| 13. | A Dark Reaction Takes Place in \_\_\_\_\_\_\_\_\_\_\_\_  A) Grana B) Stroma  C) The stroma of chloroplast D) Mitochondria | | CO4 | R | 1 |
| 14. | What is the Rate of Photosynthesis in C4 Plants?  A) Higher B) Moderate  C) Low D) Very low | | CO4 | R | 1 |
| 15. | Hormone primarily connected with cell division is   1. IAA   B) NAA   C) Cytokinin/zeatin D) Gibberellic acid | | CO5 | U | 1 |
| 16. | Gibberellins promote \_\_\_\_\_\_\_\_\_\_   1. Seed germination B) Seed dormancy   C) Leaf fall  D) Root elongation | | CO5 | U | 1 |
| 17. | Due to the Uneven Distribution of \_\_\_\_\_\_\_\_\_\_ Phototropic Curvature Occurs.   1. Auxin B) Cytokinins   C) Phytochrome D) Gibberellin | | CO5 | A | 1 |
| 18. | CGR stands for \_\_\_\_\_\_\_\_  A) Crop growth rate B) Crop growth regulator  C) Crop growth relative time D) Crop growth ratio | | CO6 | R | 1 |
| 19. | The leaf area index at which the maximum CGR is recorded is called as  A) optimum leaf area index B) Leaf area duration  C) Crop growth relative time D) Crop growth ratio | | CO6 | U | 1 |
| 20. | Relative growth rate also referred as \_\_\_\_\_\_\_\_\_  A) Crop growth rate B) Crop growth index  C) efficiency index D) vigor index | | CO6 | A | 1 |
| PART – B (10 X 5 = 50 MARKS)  (Answer any 10 from the following) | | | | | |
| 21. | Explain shortly about the physiology of plant tissues. | | CO1 | U | 5 |
| 22. | Differentiate the plant cell from animal cell. | | CO1 | R | 5 |
| 23. | Write the significance of transpiration? | | CO2 | E | 5 |
| 24. | Explain the open and close mechanism in dicot and monocot plant. | | CO2 | A | 5 |
| 25. | Give the deficiency and excess of nutrients symptoms for following nutrients.   1. Nitrogen B) Phosphorus C) Potassium D) Calcium E) Sulfur | | CO3 | An | 5 |
| 26. | Give functional detail of mineral nutrient in plant. | | CO3 | R | 5 |
| 27. | Give difference details in Light and Dark reactions. | | CO4 | U | 5 |
| 28. | Give difference details between C3 and C4 pathway. | | CO4 | E | 5 |
| 29. | Difference between Plant growth regulators and plant growth inhibitor. | | CO5 | A | 5 |
| 30. | Give details about the plant hormones – founding place and function in plant. | | CO5 | C | 5 |
| 31. | Explain the term of AGR, RGR and CGR. | | CO6 | An | 5 |
| 32. | What are the Physiological growth parameters in crop? | | CO6 | U | 5 |
| PART – C (2 X 15 = 30 MARKS)  (Answer any 2 from the following) | | | | | |
| 33. | a. | Explain the plant cell anatomy with the neat diagram. | CO1 | R | 15 |
|  | b. | Explain the transpiration process, mechanism and factors affecting transpiration in plant cell. | CO2 | U | 15 |
|  |  |  |  |  |  |
| 34. | a. | Briefly explain the nutrient uptake mechanisms in plantsand it factor affecting issues. | CO3 | R | 15 |
|  | b. | Explain the EMP pathway with neat representation. | CO4 | An | 15 |
|  |  |  |  |  |  |
| 35. | a. | Explain the Steps involved in Kreb’s cycle and its significance. | CO4 | An | 15 |
|  | b. | Explain the phases of plant growth. | CO6 | A | 15 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the physiology of plant tissues and cells. |
| CO2 | Remember water movement in plant systems like diffusion and osmosis. |
| CO3 | Apply the concept of water relations, mineral uptake in the field of agriculture. |
| CO4 | Summarize the various physiological processes. |
| CO5 | Measure and analyze the physiological parameters of crops. |
| CO6 | Practice the use of growth regulators correctly to solve physiological problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 21 | 6 | 1 | - | - | - | 28 |
| CO2 | 1 | 1 | 5 | 1 | 5 | - | 13 |
| CO3 | 8 | - | - | 5 | - | - | 13 |
| CO4 | 2 | 6 | 1 | 30 | 6 | - | 45 |
| CO5 | - | 2 | 6 | - | - | 5 | 13 |
| CO6 | 1 | 6 | 1 | 5 | - | - | 13 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2004** | **Duration** | **3hrs** |
| **Course Name** | **CROP PRODUCTION TECHNOLOGY-1 (KHARIF CROPS)** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | It is believed that the Latin word “Oryza” originated from the Dravidian word ------------- which means rice . | | CO1 | U | 1 |
| 2. | If rice growing season in Tamil Nadu is June – September, it is known as ------------------ . | | CO1 | E | 1 |
| 3. | Cotton seed + lint is known as ------------------ . | | CO3 | R | 1 |
| 4. | Milling yields on an average ------------------- % rice. | | CO2 | R | 1 |
| 5. | ----------- crop is called “Camel Crop” because of its ability to grow in arid soils and withstand prolonged droughts. | | CO2 | U | 1 |
| 6. | CSH 22 SS is a ----------------- sorghum. | | CO2 | R | 1 |
| 7. | The common name of *Pennisetum glaucum* is ------------------ millet. | | CO3 | U | 1 |
| 8. | The common name of Eleusine coracana is---------------- millet. | | CO3 | R | 1 |
| 9. | Nitrogen fixing biofertilizer used for seed treatment in non- legumes is -------------------------. | | CO3 | An | 1 |
| 10. | Nitrogen fixing biofertilizer used for seed treatment in legumes is -------------------------. | | CO4 | An | 1 |
| 11. | The pre-emergence herbicide commonly recommended in pulse crop is --------------------------- . | | CO4 | U | 1 |
| 12. | One mg in one litre of water is --------------- ppm. | | CO4 | E | 1 |
| 13. | Urad is the common name of -------------------- gram. | | CO5 | R | 1 |
| 14. | The oil percentage of sesame seeds is -------------- %. | | CO5 | E | 1 |
| 15. | ------------------- crop is known as the ‘King’ of oilseeds. | | CO6 | U | 1 |
| 16. | ------------------ is a pulse cum oilseed crop and is the most important oilseed crop of India. | | CO6 | R | 1 |
| 17. | On an average, --------------- grains contain about 20.5% carbohydrates, 43.2% protein, 20.0% oils, 4.5% minerals, 3.7% fibre and 8.1% water. | | CO6 | U | 1 |
| 18. | One bale of jute is -------- kg | | CO2 | C | 1 |
| 19. | Golden Fiber Revolution is the revolution in ---------------- crop. | | CO2 | A | 1 |
| 20. | Hybrid Napiergrass is a cross between Napier grass and-------- crop. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Distinguish between sorghum poisoning and sorghum injury. | | CO3 | An | 5 |
| 22. | Explain the climatic and soil requirements of pearl millet. | | CO4 | U | 5 |
| 23. | Write a short note on nutri cereals. | | CO2 | C | 5 |
| 24. | Write a short note on seed treatment of pigeon pea. | | CO5 | R | 5 |
| 25. | Write a short note on multi bloom technology in green gram. | | CO6 | An | 5 |
| 26. | Write a short note on classification of groundnut based on growth habits with examples. | | CO3 | A | 5 |
| 27. | Explain the foliar nutrition of soybean crop. | | CO1 | E | 5 |
| 28. | Explain the economic importance of cotton in India. | | CO2 | U | 5 |
| 29. | Explain nipping in cotton and a short explanation on Bt cotton. | | CO6 | A | 5 |
| 30. | Workout the commercial fertilizers (urea (16% N), DAP (18-46-0) and Muriate of potash (60 % K) required for supplying NPK @ 25: 50:25 kg/ha for red gram crop ?. | | CO5 | E | 5 |
| 31. | Mention the parents of hybrid Napier. What are the specialities of hybrid Napier grass. | | CO3 | C | 5 |
| 32. | Write a short not on the importance of soybean in India. | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the types of sorghum cultivated in India with examples and the climatic requirement of sorghum. | CO4 | A | 8 |
|  | b. | List out the five minor millets cultivated in India with their botanic names. | CO5 | R | 7 |
| 34. | a. | Explain the land preparation, seed treatment, sowing, spacing and weed management in groundnut | CO1 | C | 7 |
|  | b. | Explain the reasons for low production and productivity of pulses in India. | CO6 | An | 8 |
| 35. | a. | Mention the species of cotton grown in India with the percentage of area under each species. | CO3 | E | 7 |
|  | b. | Write in detail about processing of jute | CO2 | An | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand the kharif crops and crop production technology for kharif crops. |
| CO2 | Gain knowledge on geographical distribution of kharif crops uses and products. |
| CO3 | Recall the morphological features and crop production requirements for kharif season crops. |
| CO4 | Remember soil and climatic requirements of different kharif crop varieties. |
| CO5 | Acquire the knowledge on crop management practices for kharif season. |
| CO6 | Apply the acquired knowledge to guide the farmers for cultivating kharif crops. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 0 | 1 | 0 | 0 | 6 | 7 | 14 |
| CO2 | 2 | 11 | 1 | 8 | 0 | 6 | 28 |
| CO3 | 2 | 1 | 5 | 6 | 7 | 5 | 26 |
| CO4 | 0 | 7 | 8 | 1 | 1 | 0 | 17 |
| CO5 | 13 | 0 | 0 | 0 | 6 | 0 | 19 |
| CO6 | 1 | 2 | 5 | 13 | 0 | 0 | 21 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2005** | **Duration** | **3hrs** |
| **Course Name** | **CROP PRODUCTION TECHNOLOGY – 1I (RABI CROPS)** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | State the economic importance of wheat. | | CO1 | U | 1 |
| 2. | Write a short note on oilseeds cultivation. | | CO1 | R | 1 |
| 3. | State the importance and scope of sunflower. | | CO1 | An | 1 |
| 4. | Define water requirement. | | CO3 | A | 1 |
| 5. | Define food value of grain cereals. | | CO3 | U | 1 |
| 6. | Discuss on recent innovation and advancement in rabi crop production. | | CO6 | U | 1 |
| 7. | Define Plant protection measures in wheat. | | CO3 | R | 1 |
| 8. | List out the important oil seeds varieties. | | CO4 | R | 1 |
| 9. | Enlist the Critical growth stages of wheat. | | CO3 | R | 1 |
| 10. | Define Gap filling. | | CO2 | R | 1 |
| 11. | Define Crop logging. | | CO2 | An | 1 |
| 12. | Explain about the Quality of wheat. | | CO3 | U | 1 |
| 13. | Define oat. | | CO3 | R | 1 |
| 14. | Discuss on growth phases of sugarcane. | | CO5 | R | 1 |
| 15. | Describe Seed treatment in barley. | | CO3 | U | 1 |
| 16. | List out the cultivated spices in mustard. | | CO4 | U | 1 |
| 17. | Define seed treatment. | | CO2 | U | 1 |
| 18. | Write the Economic importance of chickpea. | | CO2 | R | 1 |
| 19. | Define Nipping. | | CO2 | R | 1 |
| 20. | **Illustrate the Precautions in Seed Treatment.** | | CO2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain in detail the classification of wheat. | | CO3 | R | 5 |
| 22. | Write the economic importance of rapeseed. | | CO4 | R | 5 |
| 23. | Write about the botanical description of wheat. | | CO2 | R | 5 |
| 24. | Briefly discuss about Seed treatment and fertilizer application in chickpea. | | CO2 | R | 5 |
| 25. | Discuss about the seed rate, sowing and cropping pattern of lentil. | | CO4 | A | 5 |
| 26. | Write about the advantages of Sustainable Sugarcane Initiative. | | CO5 | An | 5 |
| 27. | Explain about production constraints of Wheat. | | CO2 | A | 5 |
| 28. | Write the advantages of zero tillage wheat. | | CO2 | R | 5 |
| 29. | Explain the importance of sugar crops. | | CO5 | R | 5 |
| 30. | Elaborate about the Nutritional value of oilseeds. | | CO4 | U | 5 |
| 31. | Explain about the Geographical Distribution and objectives of Sugarcane Industry in India. | | CO6 | U | 5 |
| 32. | Explain manuring and fertilization in rapeseed. | | CO4 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain barley-origin, soil, land preparation, fertilizer management, harvest and yield. | CO3 | R | 7.5 |
|  | b. | Compare and construct about conventional and SSI method of planting. | CO4 | U | 7.5 |
| 34. | a. | Write about the low yield of pulse production in India. | CO1 | An | 7.5 |
|  | b. | Write a short note on weed management in wheat. | CO3 | A | 7.5 |
| 35. | a. | Write the uses / economic importance of chickpea and lentil. | CO4 | R | 7.5 |
|  | b. | Describe the field preparation of Oats. | CO5 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the economic importance of *Rabi* crops. |
| CO2 | Know the agro-ecological requirements for Rabi crop production. |
| CO3 | Apply cultural practices and post harvest technology for Wheat and Barley . |
| CO4 | Apply cultural practices and post harvest technology for oilseeds and pulses. |
| CO5 | Apply cultural practices and post harvest technology of sugarcane and medicinal crops. |
| CO6 | Be aware of the innovations and research advancements in *Rabi* crop production. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 1 | - | 8.5 |  |  | 10.5 |
| CO2 | 19 | 1 | 5 | 1 |  |  | 26 |
| CO3 | 15.5 | 3 | 8.5 | - |  |  | 27 |
| CO4 | 13.5 | 13.5 | 10 |  |  |  | 37 |
| CO5 | 13.5 | - | - | 5 |  |  | 18.5 |
| CO6 | - | 6 | - | - | - | - | 6 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2006** | **Duration** | **3hrs** |
| **Course Name** | **FARMING SYSTEMS & SUSTAINABLE AGRICULTURE** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Yearly sequence and spatial arrangement of crops and fallow on a given area is known as \_\_\_\_\_\_\_\_\_\_. | | CO1 | U | 1 |
| 2. | Growing of only one crop on a piece of land year after year is known as \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | In \_\_\_\_\_\_\_\_\_\_ series of inter-cropping the plant population of both component crops are lesser than the recommended population in pure stand. | | CO1 | R | 1 |
| 4. | Planning Commission of India divided the country in to \_\_\_\_\_\_\_\_\_\_ Agroclimatic Zones based on homogeneity in physiography and climate. | | CO1 | E | 1 |
| 5. | When a chemical produced by a component crop is harmful to the associated crop or the crops grown in sequence, is called \_\_\_\_\_\_\_\_\_\_. | | CO1 | A | 1 |
| 6. | Sowing crops without any preparatory cultivation is known as --------\_\_\_\_\_\_\_\_\_\_ tillage. | | CO1 | R | 1 |
| 7. | Important nutrient that will be available to the crop, inaddition to nitrogen as a result of legume effect is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | CO1 | An | 1 |
| 8. | Relative land area under sole crop required to produce the same yield as obtained under a mixed or inter cropping system at the same level of management is known as \_\_\_\_\_\_\_\_\_\_ equivalent ratio. | | CO5 | U | 1 |
| 9. | \_\_\_\_\_\_\_\_\_\_ gives a simple measure of how much the relative yield increase in component ‘a’ is greater than that for component ‘b’ in intercropping. | | CO5 | C | 1 |
| 10. | Gross returns/Cost of cultivation is \_\_\_\_\_\_\_\_\_\_ ratio. | | CO5 | An | 1 |
| 11. | A system of farming on a particular farm including several enterprises like crops and livestock to sustain and satisfy the needs of the farmer is called \_\_\_\_\_\_\_\_\_\_ farming. | | CO4 | A | 1 |
| 12. | Integration of two or more appropriate agricultural enterprises that are mutually supportive to each other like crop, dairy, piggery, fishery, poultry, bee keeping etc. is called \_\_\_\_\_\_\_\_\_\_ farming system. | | CO4 | An | 1 |
| 13. | Rice + fish + poultry + mushroom is an integrated farming model suitable for \_\_\_\_\_\_\_\_\_\_ land ecosytems. | | CO4 | C | 1 |
| 14. | Silvipasture and goat unit are essential components of \_\_\_\_\_\_\_\_\_\_ land based farming system. | | CO4 | E | 1 |
| 15. | Expand: LEISA | | CO6 | C | 1 |
| 16. | \_\_\_\_\_\_\_\_\_\_ mushroom cultivation is simple and widely practiced under IFS. | | CO2 | U | 1 |
| 17. | Low external input and \_\_\_\_\_\_\_\_\_\_ agriculture is a form of LEIA that optimize local resource utilization in such a way that the use of external inputs is not excluded and seen as complementary to the use of local resources. | | CO3 | A | 1 |
| 18. | An after-planting crop residue cover of minimum \_\_\_\_\_\_\_\_\_\_ percent is essential in conservation agriculture. | | CO3 | E | 1 |
| 19. | Use of quality seeds is a \_\_\_\_\_\_\_\_\_\_ input in IFS. | | CO2 | U | 1 |
| 20. | Improving labour efficiency and reducing labour requirement is a cost \_\_\_\_\_\_\_\_\_\_ method in IFS. | | CO2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define multiple cropping and list out the different forms or types of multiple cropping. | | CO1 | A | 5 |
| 22. | List out the agro-climatic zones of Tamil Nadu. Brief out prominent cropping system adopted in Cauvery Delta Region. | | CO2 | C | 5 |
| 23. | What are the criteria to be followed for the selection of crops for intercropping? | | CO1 | U | 5 |
| 24. | Define LER. Yield of main crop and sub crop as sole crops were 2500 and 1050 kg ha-1. Corresponding yields in intercropping were 2000 and 600 kg ha-1. Calculate LER. | | CO6 | An | 5 |
| 25. | Define IFS. List out the benefits of IFS. | | CO4 | R | 5 |
| 26. | List out the possible enterprises that can be combined in wetland, garden land and dryland eco systems. | | CO4 | E | 5 |
| 27. | Prepare a farm plan for 1 acre wetland with the following enterprises: paddy-poultry- fish- mushroom. | | CO5 | An | 5 |
| 28. | Explain in brief about the enterprises that can be combined with cropping systems to make it as a farming system. | | CO5 | E | 5 |
| 29. | Prepare an IFS model for the drylands of Tamil Nadu. | | CO5 | C | 5 |
| 30. | Define LEISA. List out the differences between HEIA and LEISA. | | CO3 | U | 5 |
| 31. | What is conservation agriculture? Discuss its advantages and disadvantages. | | CO3 | A | 5 |
| 32. | List out the non-monetary inputs in IFS. | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss about agronomic measures for reducing labours during manuring. | CO6 | E | 7 |
| b. | List out the promising LEISA techniques and practices. | CO3 | U | 8 |
|  |  |  |  |  |  |
| 34. |  | Develop a suitable IFS model for wetlands of Tamil Nadu and indicate the resource recycling through suitable drawing. | CO4 | C | 15 |
|  |  |  |  |  |  |
| 35. | a. | Explain the advantages of IFS. | CO5 | An | 7 |
| b. | Explain the necessities for a farming system approach. | CO6 | A | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the different cropping and farming systems. |
| CO2 | Differentiate the different types of farming and cropping systems. |
| CO3 | Relate between sustainable agriculture and conventional agriculture. |
| CO4 | Understand different concept and components of integrated farming systems management. |
| CO5 | Understand the indicators in cropping, farming and integrated farming system. |
| CO6 | Evaluation of cropping, farming and integrated farming system. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 6 | 6 | 1 | 1 |  | 17 |
| CO2 | 6 | 2 |  |  |  | 5 | 13 |
| CO3 |  | 13 | 6 |  | 1 |  | 20 |
| CO4 | 5 |  | 1 | 1 | 6 | 16 | 29 |
| CO5 |  | 1 |  | 13 | 5 | 6 | 25 |
| CO6 |  |  | 8 | 5 | 7 | 1 | 21 |
| Total | | | | | | | 125 |



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| **Course Code** | **21AG2012** | **Duration** | **3hrs** |
| **Course Name** | **WEED MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | “Weeds are the plants, which grow where they are not wanted” definition was coined by \_\_\_\_\_\_\_ in \_\_\_\_\_year. | | CO 1 | R | 1 |
| 2. | -------------- is known as partial root parasitic weed in----------------and --------- host crops. | | CO 1 | R | 1 |
| 3. | Weed seeds that are incompletely digested and carried away by the digestive tracts of animals is called as ………………… | | CO1 | U | 1 |
| 4. | -------------- & weeds are mimicry weeds in rice & wheat  respectively. | | CO 2 | U | 1 |
| 5. | Undesired plants which have no economic value and growing out of their proper place are called as……………. | | CO 2 | A | 1 |
| 6. | Yellow nut sedge ………..number seeds per gram | | CO 2 | E | 1 |
| 7. | African sleeping sickness caused by weed | | CO 1 | C | 1 |
| 8. | *Avena ludoviciana, Phalaris minor* weeds in the wheat field had caused… % of yield losses. | | CO 3 | An | 1 |
| 9. | Weed seed dispersal by wind with papery balloon like structure ………….weed | | CO 3 | C | 1 |
| 10. | Leaves &inflorescence of *Parthenium hysterophorus* affect the germination and seedling of ……….& crops | | CO 3 | E | 1 |
| 11. | …………….year 2,4-D was discovered & number of currently available herbicides are ……….. | | CO 2 | A | 1 |
| 12. | …………… herbicides kill all the vegetation without regard to species and ………… is the example. | | CO 2 | E | 1 |
| 13. | ………..application of herbicide to small patches of weeds leaving weed free patches mostly used to control weeds | | CO 2 | E | 1 |
| 14. | Chemicals used to inactivate the applied herbicides are called as……………. | | CO 2 | An | 1 |
| 15. | *Phalaris minor* in wheat can be controlled by--------------herbicides. | | CO 2 | E | 1 |
| 16. | Glyphosate block-------------- pathway | | CO 2 | E | 1 |
| 17. | Give an example of herbicide resistant cotton…………. | | CO 3 | C | 1 |
| 18. | First herbicide resistant weed in India …………… | | CO 3 | E | 1 |
| 19. | Suggest a low dose herbicide for early post emergence management of weeds in direct seed rice. | | CO 3 | R | 1 |
| 20. | A toxic chemical which is present in herbicide is called as…………………. | | CO 3 | E | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Mention the beneficial effect of weeds with examples. | | CO1 | R | 5 |
| 22. | Explain about Factors Affecting Persistence of Weeds. | | CO 1 | U | 5 |
| 23. | Mention about the aquatic weeds classification according to their habitat. | | CO 2 | U | 5 |
| 24. | List out the types of parasitic weeds with example and host plants. | | CO 3 | A | 5 |
| 25. | Explain in detail about life cycle of weeds with example. | | CO 4 | E | 5 |
| 26. | Write about crop weed competition in detail. | | CO5 | A | 5 |
| 27. | Explain about cultural weed control method. | | CO 2 | C | 5 |
| 28. | IWM in agricultural crops and cropping systems. | | CO 3 | A | 5 |
| 29. | Discuss in detail about the causes of weed shift. | | CO6 | C | 5 |
| 30. | Factors influencing persistence of herbicide in soil. | | CO 5 | U | 5 |
| 31. | Mention the herbicide formulations with examples. | | CO 4 | C | 5 |
| 32. | Adjuvants, Protectants and Antidotes role in herbicide use efficiency. | | CO 6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss about five predominant classification of weeds with examples. | CO1 | R | 5 |
|  | b. | Mention ten important chemical classification of herbicides with  Example. | CO 4 | U | 10 |
| 34. | a. | Explain in detail about fate of herbicides in soil. | CO 3 | A | 8 |
|  | b. | Discuss about the mode of action of herbicide in plants. | CO4 | An | 7 |
| 35. | a. | Classification and characteristics of herbicides. | CO 5 | E | 8 |
|  | b. | Explain about the management of herbicide residues in soil. | CO 6 | C | 7 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Identify and classify the weeds of terrestrial and aquatic ecosystems. |
| CO2 | Understand the weeds of different agro-ecosystems. |
| CO3 | Assess the impact of weeds on crops and cropping systems. |
| CO4 | Formulate Integrated Weed Management Practices. |
| CO5 | Recommend various weed management practices to farmers. |
| CO6 | Monitor and predict occurrence and invasion of new weeds in different ecosystems. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 12 | 6 | - | - | 5 | 5 | 28 |
| CO2 | - | 12 | 18 | - | 5 | - | 35 |
| CO3 | 6 | - | 8 | - | 3 | 7 | 24 |
| CO4 | - | - | 8 | - | - | - | 8 |
| CO5 | - | - | - | - | 7 | - | 7 |
| CO6 | - | - | - | - | - | 8 | 8 |
|  | | | | | | | **110** |



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| **Course Code** | **21AG2052** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL FINANCE AND COOPERATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Where is the Head office of DICGC of India located? | | CO3 | R | 1 |
| 2. | What is called as quick assets? | | CO2 | R | 1 |
| 3. | What is crop insurance? | | CO6 | R | 1 |
| 4. | What is called as BCR? | | CO2 | R | 1 |
| 5. | When Cooperative Societies Act was passed in India? | | CO3 | R | 1 |
| 6. | What is called as Micro Finance? | | CO3 | R | 1 |
| 7. | What is NABARD? | | CO3 | R | 1 |
| 8. | What is NCDC? | | CO3 | R | 1 |
| 9. | When did NAFED was established? | | CO3 | R | 1 |
| 10. | What is the name used to indicate the amount of time it takes to recover the cost of an investment in a project? | | CO2 | R | 1 |
| 11. | What is scale of finance? | | CO2 | R | 1 |
| 12. | Which bank was the sole banker to the government until the establishment of the Reserve Bank of India in 1935? | | CO1 | R | 1 |
| 13. | Which financial institution promote the social and economic progress of the Asian and Pacific region? | | CO3 | R | 1 |
| 14. | Which committee recommended the Lead bank scheme? | | CO3 | R | 1 |
| 15. | When Imperial Bank of India was renamed as State Bank of India? | | CO3 | R | 1 |
| 16. | What is called as cooperative warehousing? | | CO6 | R | 1 |
| 17. | Find true or false: Nationalisation of 14 banks was made in the year 1969. | | CO3 | R | 1 |
| 18. | Which type of credit is given when livestock is pledged as security? | | CO2 | R | 1 |
| 19. | What are the three R’S of credit? | | CO2 | R | 1 |
| 20. | What is called as Kisan Credit Card? | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the 5 C’s of credit. | | CO5 | C | 5 |
| 22. | Distinguish production credit and marketing credit. | | CO1 | An | 5 |
| 23. | Write in brief – Disadvantage of loans availed from landlords. | | CO1 | R | 5 |
| 24. | Explain SWOT analysis. | | CO5 | U | 5 |
| 25. | Explain the functions of NCUI. | | CO1 | E | 5 |
| 26. | Compare the differences between financing of Agriculture and other Sectors. | | CO1 | An | 5 |
| 27. | Explain the functions of Asian Development Bank. | | CO3 | E | 5 |
| 28. | Distinguish institutional and non-institutional source of finance. | | CO1 | An | 5 |
| 29. | Elaborate the functions of commercial banks in India. | | CO3 | C | 5 |
| 30. | Explain balance sheet. | | CO4 | U | 5 |
| 31. | Explain the principles of Cooperatives. | | CO2 | E | 5 |
| 32. | Explain about Credit Guarantee Corporation of India. | | CO3 | E | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Summarize the types of Cooperatives. | CO3 | U | 7.5 |
|  | b. | Explain the classification of Agricultural credit. | CO1 | E | 7.5 |
| 34. | a. | Explain the activities of NAFED. | CO3 | E | 7.5 |
|  | b. | Elaborate the functions of RRB. | CO3 | C | 7.5 |
| 35. | a. | Explain the functions of NABARD. | CO3 | E | 7.5 |
|  | b. | Identify the reasons behind rural indebtness in India. | CO1 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand Financial system in India. |
| CO2 | Apply principles of banking and credit appraisal procedure. |
| CO3 | Analyze credit and deposit services of private, public and cooperative sector banks. |
| CO4 | Prepare and analyze Balance Sheet and Income and Expenditure Statements of a business unit. |
| CO5 | Develop skills in credit analysis, dealing with bankers, loan application procedures. |
| CO6 | Popularize farmer-friendly schemes of Crop insurance and Cooperative warehousing among farmers. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 6 | 0 | 7.5 | 15 | 12.5 | 0 | 41 |
| CO2 | 6 | 0 | 0 | 0 | 5 | 0 | 11 |
| CO3 | 11 | 7.5 |  |  | 25 | 12.5 | 56 |
| CO4 |  | 5 |  |  |  |  | 5 |
| CO5 |  | 5 |  |  |  | 5 | 10 |
| CO6 | 2 |  |  |  |  |  | 2 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2053** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL MARKETING TRADE & PRICES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The word *market* originated from \_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 2. | Transferring of ownership from one person to another is called \_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 3. | -------- market is one which has only two buyers of a commodity. | | CO1 | R | 1 |
| 4. | Markets in which business is done in accordance with rules and regulations framed by certain organization is called\_\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 5. | Equation for marketable surplus is \_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 6. | The subject matter of economics dealing with a large aggregate or economy is called\_\_\_\_\_\_\_\_\_\_. | | CO2 | U | 1 |
| 7. | A market in which the purchase and sale of a commodity takes place at time but the exchange of the commodity takes place on future\_\_\_\_\_\_\_\_. | | CO3 | A | 1 |
| 8. | The AGMARK Head Office is located in \_\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | A | 1 |
| 9. | The packaging of a group of consumer packets is called\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | A | 1 |
| 10. | In PLC, \_\_\_\_\_\_\_\_stage need more marketing cost to create customer awareness and interest. | | CO4 | An | 1 |
| 11. | A firm that performs more than one activity in the sequence of the marketing process is called \_\_\_\_\_\_\_ | | CO4 | An | 1 |
| 12. | Difference between the prices prevailing at successive stages of marketing at a given point of time is called as \_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | An | 1 |
| 13. | Who is closest to the consumer in the marketing channel? | | CO5 | E | 1 |
| 14. | Who is more common market intermediary in regulated market? | | CO5 | E | 1 |
| 15. | Indian institute of packaging is located at\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 16. | AGMARK seal is compulsory for \_\_\_\_\_\_\_\_\_\_produce. | | CO1 | R | 1 |
| 17. | Indian society of agricultural marketing is located at\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 18. | The quantity of produce, which the farmer actually sells in the market irrespective of his requirements is known as \_\_\_\_\_\_\_\_. | | CO6 | C | 1 |
| 19. | The marketed surplus is \_\_\_\_\_\_\_ than marketable surplus at distress sale of a farmer. | | CO6 | C | 1 |
| 20. | Investigate which is middlemen with reference to ‘A class trader’ in a regulated market. | | CO6 | C | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | List the characteristics of agricultural marketing in India. | | CO1 | R | 5 |
| 22. | Define the market structure and its types. | | CO1 | R | 5 |
| 23. | Describe market channel and channel for cereals. | | CO2 | U | 5 |
| 24. | Write operation of facilitative Middlemen with example. | | CO3 | A | 5 |
| 25. | Demonstrate the Open Auction Method and its merits. | | CO3 | A | 5 |
| 26. | Distinguish the market integration in market. | | CO4 | An | 5 |
| 27. | Differentiate the market mix and segmentation. | | CO4 | An | 5 |
| 28. | Write the value of product life cycle and its management. | | CO5 | E | 5 |
| 29. | Describe about weather based crop insurance. | | CO2 | U | 5 |
| 30. | Write the development of Agricultural Price and its policy. | | CO6 | C | 5 |
| 31. | Write the formulation of trade and its theories. | | CO6 | C | 5 |
| 32. | Write the design of Intellectual property rights. | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe about co-operative marketing. | CO2 | U | 8 |
|  | b. | Define risk, types and measure to minimize. | CO1 | R | 7 |
| 34. | a. | Organize about the market promotion activities in marketing. | CO4 | An | 8 |
|  | b. | List out the role of government in agricultural marketing. | CO3 | A | 7 |
| 35. | a. | Describe the objectives and functions of central warehouse corporation. | CO5 | E | 8 |
|  | b. | Discuss the design of WTO and its implication in India. | CO6 | C | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Know the contours of agricultural market ecosystem, different market structures and their functions. |
| CO2 | Analyze the demand and supply problems in agricultural marketing systems, marketing efficiency and policies. |
| CO3 | Demonstrate the methods of valuation of farm assets |
| CO4 | Understand the food supply chain and its actors and activities. |
| CO5 | Gain practical skills on dealing with marketing institutions and warehouses. |
| CO6 | Understand international trade arrangements under WTO, Agreement on Agriculture (AOA) and EXIM policies |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 24 |  |  |  |  |  |  |
| CO2 |  | 20 |  |  |  |  |  |
| CO3 |  |  | 21 |  |  |  |  |
| CO4 |  |  |  | 20 |  |  |  |
| CO5 |  |  |  |  | 7 | 7 |  |
| CO6 |  |  |  |  |  |  | 26 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2102** | **Duration** | **3hrs** |
| **Course Name** | **RURAL SOCIOLOGY & EDUCATIONAL PSYCHOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Rural Sociology. | | CO1 | R | 1 |
| 2. | Define Extension Education. | | CO1 | R | 1 |
| 3. | Explain the cultural diffusion and their methods. | | CO3 | U | 1 |
| 4. | Define Matriarchal family. | | CO2 | U | 1 |
| 5. | Explain the Cross-Roads And Market Centre Settlements. | | CO2 | U | 1 |
| 6. | Define Seasonal migration. | | CO2 | R | 1 |
| 7. | Explain the formal means of social control. | | CO3 | R | 1 |
| 8. | DefineEcological entities. | | CO3 | U | 1 |
| 9. | DefineEthos. | | CO3 | U | 1 |
| 10. | Differentiate Voluntary and Involuntary Group. | | CO1 | U | 1 |
| 11. | Explain the differences between Mores and Taboos. | | CO3 | U | 1 |
| 12. | Explain Cultural traits. | | CO3 | R | 1 |
| 13. | Define Intelligence. | | CO4 | R | 1 |
| 14. | Describe about the Material culture. | | CO3 | U | 1 |
| 15. | Define Educational Psychology. | | CO4 | R | 1 |
| 16. | Describe Illusion and Hallucination. | | CO5 | U | 1 |
| 17. | Define Social institutions. | | CO2 | U | 1 |
| 18. | Explain Net Migration. | | CO2 | A | 1 |
| 19. | Describe about the intelligence Quotient (IQ). | | CO4 | An | 1 |
| 20. | Define Attitude. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Describe the Classification of family. | | CO2 | A | 5 |
| 22. | List the types of Social Values. | | CO3 | R | 5 |
| 23. | Explain the difference between class and caste system. | | CO2 | U | 5 |
| 24. | Write briefly the types of migration and factors of migration. | | CO2 | R | 5 |
| 25. | Write in detail the types of learning. | | CO6 | U | 5 |
| 26. | Explain Maslow’s hierarchy of needs. | | CO5 | U | 5 |
| 27. | Write in detail classification of customs. | | CO3 | A | 5 |
| 28. | List and explain the types of intelligence and measurement of intelligence. | | CO4 | U | 5 |
| 29. | Write in detail the types of motivation. | | CO5 | R | 5 |
| 30. | Explain learning situation. | | CO6 | U | 5 |
| 31. | Describe different patterns of rural settlement. | | CO2 | R | 5 |
| 32. | List the factors affecting personality. | | CO4 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | List out the differences between Rural and Urban Community. | CO1 | R | 7.5 |
|  | b. | Write the classification of social groups. | CO1 | U | 7.5 |
| 34. | a. | Write briefly about the social interaction process and its types. | CO3 | U | 7.5 |
|  | b. | Write in detail the attributes of attention and span of attention. | CO5 | R | 7.5 |
| 35. | a. | Define personality. Describe the tests for measuring personality and explain the types of personality. | CO4 | U | 7.5 |
|  | b. | Explain the steps in Extension Teaching. | CO6 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Classify the rural social groups of India. |
| CO2 | Know about the structure of the rural society, their stratification and migration. |
| CO3 | Learn about the social controls and customs of the Indian rural society with the indicators of social change. |
| CO4 | Deal with the concept of educational psychology and assess farmers based on personality determinants. |
| CO5 | Bring behavioral changes among the students. |
| CO6 | Bring in new extension activities suitable for the society. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 9.5 | 8.5 | - | - | - | - | 18 |
| CO2 | 11 | 8 | 6 | - | - | - | 25 |
| CO3 | 7 | 12.5 | 5 | - | - | - | 24.5 |
| CO4 | 7 | 12.5 | - | 1 | - | - | 20.5 |
| CO5 | 12.5 | 6 | - | - | - | - | 18.5 |
| CO6 | 8.5 | 10 | - | - | - | - | 18.5 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2102** | **Duration** | **3hrs** |
| **Course Name** | **RURAL SOCIOLOGY AND EDUCATIONAL PSYCHOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
|  | Variations in or modifications of any aspect of social process, social patterns, social interaction or social organization is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
|  | Rural Sociology is the study of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
|  | “Never do anything that you get someone to do for you” relates to Principle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | A | 1 |
|  | Who is considered to be Father of Sociology? | | CO1 | U | 1 |
|  | What is Sociometry? | | CO2 | A | 1 |
|  | Name the theory that specifies about Kaliyug wherein people are false, dishonest, selfish and consequently unhappy. | | CO1 | R | 1 |
|  | The level of intelligence IQ (90-110) may be indicated as \_\_\_\_\_\_\_\_\_\_. | | CO3 | R | 1 |
|  | Identify the method used for selecting the option leader in the village. | | CO5 | R | 1 |
|  | The type of leadership required for extension work is   1. Democratic b) Autocratic c) Lassiez Faire. | | CO5 | R | 1 |
|  | Define Extrovert and Introvert. | | CO3 | U | 1 |
|  | Name any two theories of social change. | | CO4 | R | 1 |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the production of desirable changes in knowledge, skill, and attitude. | | CO1 | U | 1 |
|  | Write any two measures of social change. | | CO4 | R | 1 |
|  | Leadership is an act that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_others   1. Influence b. Direct c. Goal Seeking d. Motivates | | CO5 | R | 1 |
| 15. | What is Motive? | | CO1 | R | 1 |
| 16. | The systematic study of development of individual within the educational setting is ----------------. | | CO1 | R | 1 |
| 17. | Needs Vs Wants: Differentiate. | | CO4 | R | 1 |
| 18. | --------------is the production of desirable changes in knowledge, skill, and attitude. | | CO2 | U | 1 |
| 19. | What is Perception? | | CO4 | R | 1 |
| 20. | Who is a Laissezfaire leader? | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What is Social Psychology? How it can be used for Agri. Extension? | | CO5 | U | 5 |
| 22. | IQ Vs EQ: Differentiate with examples. Which is more crucial for extension work? | | CO1 | A | 5 |
| 23. | What is the difference between a boss and a leader? | | CO5 | R | 5 |
| 24. | Explain different types of values (Classification). | | CO2 | U | 5 |
| 25. | Illustrate the Sociometry method of selecting leaders. | | CO5 | An | 5 |
| 26. | List out indicators of Social Change. | | CO1 | C | 5 |
| 27. | Explain the importance of educational psychology in agriculture extension. | | CO4 | E | 5 |
| 28. | Explain any three theories of motivation. | | CO3 | U | 5 |
| 29. | Elucidate the different types of personality given by Sheldon. | | CO3 | U | 5 |
| 30. | Illusion Vs Hallucination: Differentiate with examples in agriculture. | | CO3 | U | 5 |
| 31. | Explain Pavlovs’ experiment on Conditioning. | | CO6 | U | 5 |
| 32. | Explain different types of memory. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss on the methods used for selection of leaders along with its advantages and disadvantages. | CO5 | E | 8 |
|  | b. | Explain the different leadership styles. | CO5 | C | 7 |
|  |  |  |  |  |  |
| 34 | a. | Explain the different methods of measuring personality. | CO5 | E | 8 |
|  | b. | Briefly discuss the factors influencing intelligence. | CO4 | A | 7 |
|  |  |  |  |  |  |
| 35 | a. | What is the teaching-learning process? Describe the steps according to Wilson and Gallup. | CO1 | A | 8 |
|  | b. | Explain in detail the several classifications of social groups. | CO1 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Students learnt the rural society and their behavior pattern . |
| CO2 | Students gained the practical knowledge of functions of social institution. |
| CO3 | Familiarize the concept of agricultural extension practices. |
| CO4 | Understand the concepts of Educational Psychology, Perception, Memory,  Intelligence, Personality. |
| CO5 | Familiarize with motivation and its theories. |
| CO6 | Know about teaching learning process. |

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| Assessment Pattern as per Bloom’s Taxonomy | | | | | | | |
| CO / P | R | U | A | An | E | C | Total |
| CO1 | 5 | 5 | 21 |  |  | 5 | 36 |
| CO2 | 5 | 6 | 6 |  |  |  | 17 |
| CO3 | 2 | 15 | 6 |  |  |  | 23 |
| CO4 | 4 | 7 | 7 |  | 5 |  | 23 |
| CO5 | 4 |  |  | 5 |  | 7 | 16 |
| CO6 |  | 10 |  |  |  |  | 10 |
|  | | | | | | | 125 |



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| **Course Code** | **21AG2103** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF AGRICULTURAL EXTENSION EDUCATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Explain about formal education with example. | | CO1 | U | 1 |
| 2. | Write the details about Sriniketan Project. | | CO1 | R | 1 |
| 3. | Describe the frontline demonstration. | | CO2 | R | 1 |
| 4. | Write the details about PURA, MGNREGA. | | CO2 | R | 1 |
| 5. | Explain the POSDCORB’ functions of Administration. | | CO2 | R | 1 |
| 6. | Define: Extension programme planning. | | CO1 | U | 1 |
| 7. | Write the details about Gurgaon Project. | | CO1 | R | 1 |
| 8. | Describe the Indira Awaas Yojana. | | CO2 | R | 1 |
| 9. | Agriculture Journalism – TV journalism. | | CO6 | U | 1 |
| 10. | Define: Administration. | | CO2 | R | 1 |
| 11. | Write the details about Krishi Vigyan Kendra. | | CO3 | R | 1 |
| 12. | Define: Diffusion of Innovation. | | CO5 | U | 1 |
| 13. | Draw a diagram of Shannon- Weaver Models of communication. | | CO4 | A | 1 |
| 14. | Define cyber extension. | | CO4 | U | 1 |
| 15. | Rural Leadership. | | CO2 | U | 1 |
| 16. | Explain Result Demonstration. | | CO4 | R | 1 |
| 17. | Community Development. | | CO2 | U | 1 |
| 18. | Explain about SGSY, NREP, IRDP. | | CO2 | R | 1 |
| 19. | Define: Adoption. | | CO5 | R | 1 |
| 20. | Write the details about Kisan Call Centre. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the details about steps in extension education process. | | CO1 | U | 5 |
| 22. | Explain the details about post- independent Schemes. | | CO1 | R | 5 |
| 23. | Write the details about three tier of panchayat raj system. | | CO2 | R | 5 |
| 24. | Write the details about different types of leadership styles. | | CO2 | A | 5 |
| 25. | Explain the details about steps in extension programme planning. | | CO1 | U | 5 |
| 26. | List out the ICT Applications in TOT. | | CO4 | A | 5 |
| 27. | Write the difference between monitoring and evaluation. | | CO2 | A | 5 |
| 28. | Write the steps in adoption process. | | CO5 | U | 5 |
| 29. | Explain about Mass contact Methods. | | CO5 | R | 5 |
| 30. | Elaborate the mandatory activities of KVK. | | CO3 | R | 5 |
| 31. | Explain the types of education. | | CO1 | U | 5 |
| 32. | Write about the details of models of communication. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the details about Pre- independent Schemes. | CO1 | R | 7.5 |
|  | b. | Extension administration: meaning and concept, principles and functions. | CO2 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Write about steps in Innovation-Decision Process. | CO5 | R | 7.5 |
|  | b. | Write the details of classification of extension teaching methods. | CO5 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write the details of types of communication. | CO4 | U | 7.5 |
|  | b. | Write about the details of adopter categories. | CO5 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| **CO1** | Impart knowledge to the students on extension education and development programmes offered in India. |
| **CO2** | Acquire knowledge on extension systems in India. |
| **CO3** | Provide opportunity to students to visit organizations involved in extension activities. |
| **CO4** | Gain knowledge on transfer of technology and innovations towards agricultural development. |
| **CO5** | Enable students to develop practical skills on preparation of extension teaching methods to survey farmers. |
| **CO6** | Disseminate information and technology through audio visual aids. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 14.5 | 17 | - | - | - | - | 31.5 |
| CO2 | 11 | 9.5 | 10 | - | - | - | 30.5 |
| CO3 | 6 | - | - | - | - | - | 6 |
| CO4 | 1 | 13.5 | 6 | - | - | - | 20.5 |
| CO5 | 13.5 | 6 | 15 | - | - | - | 34.5 |
| CO6 | 1 | 1 | - | - | - |  | 2 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2103** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF AGRICULTURAL EXTENSION EDUCATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Explain about non- formal education with example. | | CO1 | U | 1 |
| 2. | Write the details about Marthandam project. | | CO1 | R | 1 |
| 3. | Describe about the frontline demonstration. | | CO2 | R | 1 |
| 4. | Write the details about ARYA, MGNREGA scheme. | | CO2 | R | 1 |
| 5. | Explain the POSDCORB’ functions of Administration. | | CO2 | R | 1 |
| 6. | Define: Extension programme planning. | | CO1 | U | 1 |
| 7. | Write the details about Gurgaon project. | | CO1 | R | 1 |
| 8. | Describe the Indira Awaas Yojana. | | CO2 | R | 1 |
| 9. | Agriculture Journalism – TV journalism. | | CO6 | U | 1 |
| 10. | Define: Administration. | | CO2 | R | 1 |
| 11. | Write the details about ATMA scheme. | | CO3 | R | 1 |
| 12. | Write the details of Grama sabha meeting. | | CO5 | U | 1 |
| 13. | Draw a diagram of J. P. Leagans models of communication. | | CO4 | A | 1 |
| 14. | Define - Cyber extension. | | CO4 | U | 1 |
| 15. | Define- Autocratic leadership. | | CO2 | U | 1 |
| 16. | Explain Result demonstration. | | CO4 | R | 1 |
| 17. | Define- Community development. | | CO2 | U | 1 |
| 18. | Explain about HYVP, DPAP, IVLP | | CO2 | R | 1 |
| 19. | Define: Adoption | | CO5 | R | 1 |
| 20. | Write the details about Kisan Call Centre. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain the details about steps in extension education process. | | CO1 | U | 5 |
| 22. | Explain the details about post- independent Schemes. | | CO1 | R | 5 |
| 23. | Write the details about three tier of panchayat raj system. | | CO2 | R | 5 |
| 24. | Write the details about different types of leadership styles. | | CO2 | A | 5 |
| 25. | Discuss Extension administration: meaning and concept, principles. | | CO1 | U | 5 |
| 26. | List out the ICT Applications in TOT. | | CO4 | A | 5 |
| 27. | Write the difference between monitoring and evaluation. | | CO2 | A | 5 |
| 28. | Write about steps in adoption process. | | CO5 | U | 5 |
| 29. | Explain about the functions of administration. | | CO5 | R | 5 |
| 30. | Write the details of mandatory activities of KVK. | | CO3 | R | 5 |
| 31. | Explain the types of education with suitable example. | | CO1 | U | 5 |
| 32. | Write the details of types of communication. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the details about steps in extension programme planning. | CO1 | R | 7.5 |
|  | b. | Explain the details about pre- independent Schemes. | CO2 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Write about steps in innovation-decision Process. | CO5 | R | 7.5 |
|  | b. | Write the details of classification of extension teaching methods. | CO5 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write about the details of models of communication. | CO4 | U | 7.5 |
|  | b. | Write about the details of adopter categories. | CO5 | A | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| **CO1** | Impart knowledge to the students on extension education and development programmes offered in India |
| **CO2** | Acquire knowledge on extension systems in India |
| **CO3** | Provide opportunity to students to visit organizations involved in extension activities |
| **CO4** | Gain knowledge on transfer of technology and innovations towards agricultural development |
| **CO5** | Enable students to develop practical skills on preparation of extension teaching methods to survey farmers |
| **CO6** | Disseminate information and technology through audio visual aids |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 14.5 | 17 | - | - | - | - | 31.5 |
| CO2 | 11 | 9.5 | 10 | - | - | - | 30.5 |
| CO3 | 6 | - | - | - | - | - | 6 |
| CO4 | 1 | 13.5 | 6 | - | - | - | 20.5 |
| CO5 | 13.5 | 6 | 15 | - | - | - | 34.5 |
| CO6 | 1 | 1 | - | - | - |  | 2 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2202** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF PLANT BREEDING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name the scientist who discovered sexuality in plants. | | CO1 | R | 1 |
| 2. | The alkaloid used for doubling the chromosome number in cells. | | CO1 | R | 1 |
| 3. | The reduction in vigour due to successive generations of selfing is called ……………… | | CO1 | U | 1 |
| 4. | The development of seed with out fertilization is known as …………. | | CO2 | R | 1 |
| 5. | If staminate and pistillate flowers are produced on the same plant it is called …………………. | | CO2 | U | 1 |
| 6. | The ploidy level of endosperm nucleus is ………… | | CO2 | R | 1 |
| 7. | The chromosome number of a somatic cell is designated as ………… | | CO3 | R | 1 |
| 8. | Two basic requirements for selection are…………………… | | CO3 | R | 1 |
| 9. | A cross between an Inbred x Open pollinated variety is called ……… | | CO3 | U | 1 |
| 10. | The production of microspore inside the anther is called………. | | CO4 | R | 1 |
| 11. | Name the cereal crop synthesized by crossing wheat and rye | | CO4 | U | 1 |
| 12. | Hybrid population is homogeneous and individual plants are ……….. in nature | | CO4 | R | 1 |
| 13. | The mode of pollination in rice…………………. | | CO5 | U | 1 |
| 14. | The source of dwarfing gene in wheat…………………….. | | CO5 | R | 1 |
| 15. | The occurrence of genetically different tissue adjacent to each other is called………. | | CO6 | R | 1 |
| 16. | Mating between individuals related by ancestry is called ……….. | | CO6 | R | 1 |
| 17. | Expand NBPGR. | | CO6 | U | 1 |
| 18. | Name an agricultural crop in Tamil Nādu which received GI tag | | CO1 | R | 1 |
| 19. | The adverse effect caused by the host plant on the insect feeding on it is known as …………. | | CO2 | U | 1 |
| 20. | Name the phenomenon in which the flower does not open at all. | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Summarize the achievements of plant breeding programmes. | | CO1 | An | 5 |
| 22. | Write a short note on Participatory Plant Breeding. | | CO2 | U | 5 |
| 23. | Briefly explain the biotechnological tools used in crop improvement. | | CO3 | An | 5 |
| 24. | What is meant by distant hybridization. Give examples. How to overcome the barriers in distant hybridization? | | CO4 | U | 5 |
| 25. | What are the mechanisms of insect resistance. What are the screening techniques used for insect resistance. | | CO5 | An | 5 |
| 26. | Distinguish between auto and allopolyploids. How triploids can be used in crop improvement. | | CO6 | U | 5 |
| 27. | Define heterosis. What are the different methods of estimation of heterosis? | | CO1 | An | 5 |
| 28. | What are the salient features of Protection of Plant Varieties and farmers act? | | CO2 | U | 5 |
| 29. | What are the different types of mutation? Give the classification of mutagens with examples | | CO3 | An | 5 |
| 30. | What are different types of self-incompatibility? How it used for the production of hybrids? | | CO4 | U | 5 |
| 31. | What is Hardy-Weinberg Law? Explain the conditions for maintaining the equilibrium constant. | | CO5 | An | 5 |
| 32. | Define a pure line variety. What are the causes of variation in a pure line variety? | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | List out the breeding methods suitable for self-pollinated crops. Describe the procedure of Pure line selection. | CO1 | A | 8 |
|  | b. | Describe the procedure for the production of synthetics and composite varieties. What are the merits and demerits? | CO3 | E | 7 |
| 34. | a. | Examine the different types of recurrent schemes used for population improvement. | CO2 | E | 7 |
|  | b. | Explain the breeding methods suitable for vegetatively propagated plants. | CO4 | A | 8 |
| 35. | a. | Explain the procedure for transfer of dominant gene resistant to rust disease in wheat by using back cross method. | CO3 | An | 8 |
|  | b. | What are different types of male sterility? Describe the method to transfer Restorer gene to the selected parent. | CO5 | An | 7 |

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Understand the basic concepts of plant breeding and genetics. | | | | | | | |
| CO2 | Remember origin and diversity of different crops, components of inheritance and variations. | | | | | | | |
| CO3 | Apply the knowledge to develop high yielding crops with better quality. | | | | | | | |
| CO4 | Produce varieties and hybrids with host plant resistance. | | | | | | | |
| CO5 | Apply the protocols of Intellectual Property Rights and patenting practically. | | | | | | | |
| CO6 | Analyze Plant Breeders and Farmer’s Rights for research and commercial seed production of high yielding crops. | | | | | | | |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 3 | 1 | 8 | 10 |  |  | 22 |
| CO2 | | 2 | 17 |  | 5 | 7 |  | 31 |
| CO3 | | 2 | 6 |  | 8 | 7 |  | 23 |
| CO4 | | 2 | 7 | 8 |  |  |  | 17 |
| CO5 | | 1 | 1 |  | 17 |  |  | 19 |
| CO6 | | 2 | 11 |  |  |  |  | 13 |
|  | | 12 | 43 |  | 40 | 14 |  | 125 |



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| **Course Code** | **21AG2203** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES OF SEED TECHNOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What are the eligible criteria of a crop variety to be registered under certified seed production? | | CO2 | U | 1 |
| 2. | Define seed technology. | | CO1 | R | 1 |
| 3. | What is off type? | | CO1 | U | 1 |
| 4. | How do you work out Seed Replacement Rate (SRR)? | | CO1 | A | 1 |
| 5. | Mention the supplementary pollination technique for hybrid paddy and sunflower seed production. | | CO3 | A | 1 |
| 6. | What do you mean by L.F.R. report? | | CO2 | U | 1 |
| 7. | Among the field crops which crop should have highest germination percentage as per IMSCS? | | CO3 | R | 1 |
| 8. | Mention the symptoms of Boron and Calcium deficiencies in groundnut. | | CO3 | A | 1 |
| 9. | What are the available alternative methods for GOT in field? | | CO5 | A | 1 |
| 10. | Mention the importance of standard samples in GOT. | | CO5 | U | 1 |
| 11. | The area registered for paddy Var. ASD 16 seed farm is 23 acres. Find out the number of counts and total number of plants to be covered per inspection. | | CO2 | An | 1 |
| 12. | What is tempering period? | | CO5 | U | 1 |
| 13. | What is drying front? | | CO5 | U | 1 |
| 14. | Give an example for direct vigour test and indirect vigour test. | | CO5 | A | 1 |
| 15. | What is the concept of seed marketing? | | CO6 | An | 1 |
| 16. | Give any two pre-requisites followed in seed processing unit, once the field run seeds are received. | | CO2 | A | 1 |
| 17. | Mention any two international organizations involved in seed trading. | | CO6 | R | 1 |
| 18. | Compare WTO with GATT. | | CO6 | E | 1 |
| 19. | What is scutellum? | | CO4 | U | 1 |
| 20. | What is raphe? | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write short note on generation system of seed multiplication. | | CO2 | An | 5 |
| 22. | Differentiate certified seed and TFL seed. | | CO2 | E | 5 |
| 23. | What are the benefits of using quality seeds? | | CO1 | U | 5 |
| 24. | How does the mutation cause varietal deterioration? And Which factor is considered as the most important sources of variety deterioration? How will you manage? | | CO2 | A | 5 |
| 25. | Differentiate seed and grain. | | CO2 | E | 5 |
| 26. | Explain the importance and method of GA3 application in paddy hybrid seed production. | | CO3 | A | 5 |
| 27. | Describe in detail about the method of detasseling in maize hybrid seed production. | | CO3 | A | 5 |
| 28. | Compare the merits and demerits of natural and mechanical methods of seed drying. | | CO5 | E | 5 |
| 29. | Explain the principle involved in Quick viability test. | | CO5 | U | 5 |
| 30. | What are the basic requirements to develop comprehensive seed markets? | | CO6 | A | 5 |
| 31. | Draw a neat sketch to explain the development of seed from flower. | | CO4 | U | 5 |
| 32. | Draw the seed morphology of maize and caster. | | CO4 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | List out six phases of Seed Certification and explain any two in detail. | CO2 | A | 8 |
|  | b. | Define seed quality. Discuss in detail about the characteristics, of quality seeds with examples. | CO1 | E | 7 |
| 34. | a. | Discuss quality seed production of black gram and green gram. | CO3 | A | 8 |
|  | b. | Write short note on Seed Control Order 1983. | CO1 | An | 7 |
| 35. | a. | Explain the various sources of transgene contaminations in organic seed production. | CO5 | An | 7 |
|  | b. | Discuss any four factors affecting seed market. | CO6 | A | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the importance of quality seed in agriculture production. |
| CO2 | Distinguish types of seeds and know seed certification process. |
| CO3 | Apply seed production techniques in cereals, pulses, and oilseeds, vegetable and forage seeds. |
| CO4 | Describe seed structure and morphology, physical characteristics of seed. |
| CO5 | Conduct varietal identification, seed quality assessments tests and seed treatments. |
| CO6 | Remember the concepts in seed storage and seed marketing. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 6 | 1 | 7 | 7 | - | 22 |
| CO2 | - | 2 | 14 | 6 | 10 | - | 32 |
| CO3 | 1 | - | 20 | - | - | - | 21 |
| CO4 | - | 7 | 5 | - | - | - | 12 |
| CO5 | - | 8 | 2 | 7 | 5 | - | 22 |
| CO6 | 1 | - | 13 | 1 | 1 | - | 16 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2304** | **Duration** | **3hrs** |
| **Course Name** | **ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name the Environmentalist who started the “Chipko” movement. | | CO1 | R | 1 |
| 2. | Define food chain. | | CO2 | U | 1 |
| 3. | Mention the disease caused by Nitrate pollution in water. | | CO3 | U | 1 |
| 4. | Define Homeostasis. | | CO2 | U | 1 |
| 5. | Name the ecological pyramid which is always upright. | | CO2 | An | 1 |
| 6. | Name the book containing the list of endangered species. | | CO4 | R | 1 |
| 7. | List two commercial products obtained from insects. | | CO4 | U | 1 |
| 8. | Name one indoor air pollutant. | | CO5 | R | 1 |
| 9. | State the year of enforcement of “Tiger Conservation Act”. | | CO4 | R | 1 |
| 10. | Mention the name of the gas responsible for the “Bhopal Tragedy”. | | CO6 | R | 1 |
| 11. | Give one example for Man-made disaster. | | CO6 | U | 1 |
| 12. | Expand RS and GIS. | | CO6 | U | 1 |
| 13. | Name the unit of measurement of Ozone layer thickness. | | CO3 | R | 1 |
| 14. | Mention the year of enactment of “The Environment (Protection) Act in India. | | CO5 | R | 1 |
| 15. | State the unit of measurement of Noise. | | CO3 | R | 1 |
| 16. | Name one index used for measurement of Biodiversity. | | CO4 | R | 1 |
| 17. | Give one reason for Nuclear Disaster. | | CO6 | U | 1 |
| 18. | State whether Chernobyl Disaster is natural or man-made. | | CO6 | U | 1 |
| 19. | Name the scale used for measuring the intensity of earthquakes. | | CO6 | R | 1 |
| 20. | Mention the ecological succession which starts in an aquatic ecosystem. | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Illustrate Nitrogen cycle with a diagram. | | CO2 | U | 5 |
| 22. | Explain the Ecological impacts of Deforestation. | | CO1 | U | 5 |
| 23. | Discuss the impacts of thermal pollution in aquatic ecosystem. | | CO3 | A | 5 |
| 24. | Explain the environmental impacts of mining and suggest remedial measures. | | CO1 | U | 5 |
| 25. | Compare and contrast Minamata Bay disease and Itai-Itai disease. | | CO3 | An | 5 |
| 26. | Explain the values of Biodiversity. | | CO2 | U | 5 |
| 27. | Classify the different types of disasters with examples. | | CO6 | U | 5 |
| 28. | Discuss the salient features of Wild Life (Protection) Act, 1972. | | CO5 | U | 5 |
| 29. | Explain in detail in-situ and ex-situ conservation process. | | CO4 | A | 5 |
| 30. | Explain in detail Global warming and its impacts. | | CO3 | U | 5 |
| 31. | Elaborate ground water contamination with one case study in India. | | CO3 | An | 5 |
| 32. | Differentiate Geothermal energy and Ocean Thermal energy. | | CO1 | An | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the multidisciplinary nature of Environmental Studies. | CO1 | U | 8 |
|  | b. | Discuss about the National Environmental Movements. | CO1 | U | 7 |
| 34. | a. | Illustrate the nutrient cycling function of the ecosystem with suitable diagram. | CO2 | U | 8 |
|  | b. | Explain the pollution caused by Agriculture sector and suggest remedies. | CO3 | A | 7 |
| 35. | a. | Discuss about the National Disaster Management Framework. | CO6 | U | 8 |
|  | b. | Elaborate the levels of Biodiversity and its assessment. | CO2 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Identify and distinguish the natural resources- Renewable and Non- renewable. |
| CO2 | Illustrate the concepts of ecosystem and biodiversity. |
| CO3 | Examine and solve environmental pollution issues. |
| CO4 | Plan the conservation strategies. |
| CO5 | Make use of Environmental legislation. |
| CO6 | Appraise the disaster management strategies. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 1 | 25 | - | 5 | - | - | 31 |
| CO2 | - | 28 | - | 1 | - | - | 29 |
| CO3 | 2 | 6 | 12 | 15 | - | - | 35 |
| CO4 | 3 | 1 | - | - | - | - | 4 |
| CO5 | 2 | 5 | - | - | - | - | 7 |
| CO6 | 2 | 17 | - | - | - | - | 19 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2305** | **Duration** | **3hrs** |
| **Course Name** | **RENEWABLE ENERGY AND GREEN TECHNOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The sun emits energy in the form of \_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | R | 1 |
| 2. | Wind electric generator converts \_\_\_\_\_\_\_\_\_\_\_\_ available in wind to electrical energy by using rotor, gear box and generator. | | CO6 | U | 1 |
| 3. | The container in which this digestion takes place is known as the \_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 4. | Henry Ford has used the term \_\_\_\_\_\_\_\_\_\_\_\_ for the ethanol. | | CO5 | R | 1 |
| 5. | Average value of solar radiation available in India is \_\_\_\_\_\_\_\_\_\_\_\_ W/m2 | | CO1 | An | 1 |
| 6. | The direct integration of pyrolysis oil in an existing oil refinery via upgrading to a renewable \_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 7. | The biogas contains traces of \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | R | 1 |
| 8. | A period of \_\_\_\_\_\_\_\_\_\_\_\_ or so enables anaerobic bacteria to convert organic matter to biogas. | | CO4 | An | 1 |
| 9. | The structure of energy consumption in Indian agriculture has changed with a marked shift from \_\_\_\_\_\_\_\_\_\_\_\_ to tractors, electricity and diesel power. | | CO3 | E | 1 |
| 10. | The chemical reaction that converts a vegetable oil or animal fat to biodiesel is called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | R | 1 |
| 11. | The gas from the gasifier burns completely, it is clean, odorless \_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | U | 1 |
| 12. | \_\_\_\_\_\_\_\_\_\_\_\_for localities with the prevailing wind in one direction, the design of a turbine can be greatly simplified | | CO6 | A | 1 |
| 13. | Slow pyrolysis is a conventional pyrolysis process whereby the heating rate is  Kept \_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | R | 1 |
| 14. | A solar collector is a device designed to absorb \_\_\_\_\_\_\_\_\_\_\_\_ and to transfer the energy to a fluid passing in contact with it. | | CO2 | U | 1 |
| 15. | What are the forms of Renewable Energy? | | CO3 | R | 1 |
| 16. | Give any one example of Renewable energy uses in Agricultural Farm. | | CO3 | R | 1 |
| 17. | \_\_\_\_\_\_\_\_\_\_\_\_ are energy conversion systems which convert solar energy into electrical energy. | | CO3 | R | 1 |
| 18. | A physical structure designed to carry out anaerobic digestion of organic  materials are called \_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | A | 1 |
| 19. | Name any two Fossil Fuels. | | CO1 | U | 1 |
| 20. | The wind mill \_\_\_\_\_\_\_\_\_\_\_\_ supports the rotor, housing the rotor bearings. | | CO6 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate between Conventional and Non-Conventional Energy. | | CO1 | An | 5 |
| 22. | Describe Biodiesel Production with neat Sketch. | | CO4 | U | 5 |
| 23. | Classify the methods of Solar Energy Utilization. | | CO2 | U | 5 |
| 24. | Discuss about the site selection for biogas Production. | | CO5 | U | 5 |
| 25. | Define Solar Energy. List out the Solar Energy Gadgets. | | CO1 | R | 5 |
| 26. | Describe about the Working Principle of Wind Turbine. | | CO6 | U | 5 |
| 27. | Define Solar Radiation measuring devices with neat Sketch.   1. Pyrheliometer (ii) Pyranometer. | | CO2 | R | 5 |
| 28. | Explain about the Uses of Windmill. | | CO6 | U | 5 |
| 29. | Interpret that how Solar Energy is used in Agricultural Field? | | CO3 | A | 5 |
| 30. | Describe about Deenabandhu type Biogas Plant with neat Sketch. | | CO5 | U | 5 |
| 31. | Discuss about Biomass Gasification with neat sketch. | | CO4 | U | 5 |
| 32. | Define with brief explanation of Solar Photovoltaic System. | | CO2 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | (i) Classify the Energy Sources.  (ii) Discuss about various causes of Global Energy Crisis. | CO1 | U | 4  3 |
|  | b. | Describe about KVIC type Biogas Plant with neat Sketch. | CO5 | U | 8 |
| 34. | a. | Interpret about Renewable Energy Potentials and achievements in India. | CO3 | A | 5 |
|  | b. | Explain any Five Solar Energy Gadgets with Neat Sketch. | CO2 | U | 10 |
| 35. | a. | Differentiate between the Gasifiers- Updraft Gasifier, Downdraft Gasifier and Cross draft Gasifier. | CO4 | An | 8 |
|  | b. | Discuss about windmill and the components of windmill. | CO6 | U | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Gain basic knowledge of Solar energy harvesting. |
| CO2 | Familiarize with different types of Solar energy gadgets. |
| CO3 | Understand the contributions of energy sources to agriculture. |
| CO4 | Remember different types of biogas production structures. |
| CO5 | Design renewable energy structures. |
| CO6 | Analyze the green energy techniques. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 6 | 8 |  | 6 |  |  | 20 |
| CO2 | 10 | 16 |  |  |  |  | 26 |
| CO3 | 3 |  | 10 |  | 1 |  | 14 |
| CO4 | 3 | 11 |  | 9 |  |  | 23 |
| CO5 | 3 | 18 | 1 |  |  |  | 22 |
| CO6 |  | 18 | 2 |  |  |  | 20 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2307** | **Duration** | **3hrs** |
| **Course Name** | **PROBLEMATIC SOILS AND THEIR MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | ....................are the lands that cannot be under vegetative cover  a. Cultivable wastelands b. Uncultivable wastelands  c. Grazing land d. All of them | | CO1 | R | 1 |
| 2. | Bulk density of sub soil hardening is  a. >1.8Mg m-3 b. <1.8Mg m-3 c. 0.5-1Mg m-3 d. A and B | | CO2 | R | 1 |
| 3. | Acid soil pH range  a. >7.0 b. <7.0 c. 7.5-9.0 d. >9.0 | | CO2 | An | 1 |
| 4. | How tree species improves soil quality  a. Increase input b. Reducing losses c. Improving physical properties  d. All the above | | CO6 | U | 1 |
| 5. | CEC is the \_\_\_\_\_\_\_\_indicator of soil health  a. Biological b. Chemical c. Physical d. None of the above | | CO2 | R | 1 |
| 6. | In the Land capability classification, the land which is suitable for cultivation with minor or no limitation is comes under the class  a. Class I b. Class II c. Class III d. Class IV | | CO6 | An | 1 |
| 7. | Which nutrient causes toxicity in submerged soils  a. Iron b. Calcium c. Magnesium d. Sodium | | CO2 | E | 1 |
| 8. | The most suited crop for reclaiming mine polluted soils is\_\_\_\_\_\_\_\_\_  a. Fruit crops b. Rice c. Oil seeds d. Multi-purpose trees | | CO6 | A | 1 |
| 9. | Erosion caused by the activities of man and sometimes by animals is called as  a. Natural erosion b. Geological erosion c. Accelerated erosion d. All | | CO2 | U | 1 |
| 10. | Match the following   1. Limestone - a) FeS2 2. Dolomite - b) CaSO4. 2H2O 3. Gypsum - c) CaCO3MgCO3 4. Pyite - d) CaCO3 5. 1-d 2-c. 3-b. 4-a 6. 1-d 2-b. 3-c. 4-a 7. 1-c 2-a 3-b. 4- d 8. 1-a 2-b, 3-c, 4-d | | CO4 | R | 1 |
| 11. | Chisel ploughing is recommended for \_\_\_\_\_\_ soil  a. Sub surface hard pan b. Highly permeable soils c. Shallow soils  d. Fluffy soils | | CO4 | U | 1 |
| 12. | Which of the following methods is not suitable for reclaiming alkali soil  a. Gypsum bed technology b. Gypsum incorporation  c. Elemental sulphur d. Lime application | | CO4 | A | 1 |
| 13. | National Remote Sensing Agency is located at  a. New Delhi b. Hyderabad c. Bangalore d. Ahmedabad | | CO5 | R | 1 |
| 14. | LCC for particular soil series is belongs to IIe- In which “e(3)” denotes  a. Soil b. Wetness c. Climate d. Erosion | | CO6 | R | 1 |
| 15. | Physiological disease of rice due to iron toxicity in submerged soils is called  a. Browning disease b. Khaira disease c. Rice blast disease d. A and B | | CO2 | E | 1 |
| 16. | High sodium in the irrigation water can cause severe soil\_\_\_\_\_\_\_  a. Permeability b. Flocculation c. Crusting d. Hydraulic conductivity | | CO3 | E | 1 |
| 17. | Soluble sodium percentage value > \_\_\_\_ % is unsuitable for irrigation  a. 50 b. 60 c. 40 d. 55 | | CO3 | An | 1 |
| 18. | Tone of color reflected in RS for saline/ Sandy soil  a. White b. Red c. Black d. Blue | | CO5 | A | 1 |
| 19. | Using of higher plants to remove soil pollution is called  a. Rhizofilteration b. Phytoremediation c. Bioremediation d. None | | CO5 | U | 1 |
| 20. | The characteristics of alkaline soil is  a. pH<8.5,EC<4 ESP>1 b. pH>8.5,EC<4:ESP<1  c. pH>8.5;EC>4;ESP>1 d. pH>8.5;EC<4;ESP>15 | | CO3 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Brief note on soil quality indicators. | | CO1 | A | 5 |
| 22. | Causes, Reclamation & management of surface & subsurface hardpan. | | CO2 | A | 5 |
| 23. | Describe multipurpose tree species on problem soils. | | CO5 | C | 5 |
| 24. | Explain the criteria for evaluating irrigation water quality. | | CO3 | A | 5 |
| 25. | Classification of waste land based on properties. | | CO2 | R | 5 |
| 26. | Write the characters of acid soil & explain the lime requirement? | | CO4 | An | 5 |
| 27. | Write the characters of saline, Sodic & saline Sodic soils? | | CO4 | U | 5 |
| 28. | An irrigation water contains 414,120 and 24 mg L' of Na', Ca, B respectively Calculate the Mg total cation concentration in meq L", and SAR value of the irrigation water. Give comments on the quality of irrigation water. | | CO3 | An | 5 |
| 29. | Extend, diagnosis & mapping of wastelands by modern RS - GIS tools. | | CO5 | A | 5 |
| 30. | A soil has an CEC of 30 c mol (+) kg soil and an ESP of 30 The final desired ESP 10. Calculate the gypsum requirement per hectare. | | CO5 | E | 5 |
| 31. | Write the agronomic practices for utilization of saline water. | | CO4 | E | 5 |
| 32. | How to agricultural ecosystem services influence soil fertility improvement in problem soils? | | CO6 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Brief about soil health indicators. | CO1 | U | 8 |
|  | b. | What are the causes of land degradation? | CO1 | An | 7 |
| 34. | a. | Elaborate soil Erosion & its Types. | CO2 | U | 7.5 |
|  | b. | Causes & management of soil erosion. | CO4 | A | 7.5 |
| 35. | a. | Elaborate in detail about the land capability classes. | CO6 | E | 7.5 |
|  | b. | Write about land suitability classification? | CO6 | E | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Soil quality and their categories. |
| CO2 | Problematic soils. |
| CO3 | Irrigation water quality standards. |
| CO4 | Soil reclamation practices for saline, sodic and acid soils. |
| CO5 | Remote sensing, GIS and bioremediation procedures. |
| CO6 | Land use patterns. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 8 | 5 | 7 |  |  | 21 |
| CO2 | 7 | 8.5 | 5 | 1 | 2 |  | 23.5 |
| CO3 |  |  | 5 | 7 | 1 |  | 13 |
| CO4 | 1 | 6 | 8.5 | 5 | 5 |  | 25.5 |
| CO5 | 1 | 1 | 6 |  | 5 | 5 | 18 |
| CO6 | 1 | 1 | 1 | 1 | 15 | 5 | 24 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2401** | **Duration** | **3hrs** |
| **Course Name** | **LIVESTOCK AND POULTRY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mastitis is the inflammation of --------- | | CO6 | U | 1 |
| 2. | The gestation period of cow in days is --------- | | CO3 | R | 1 |
| 3. | An exotic breed of sheep that produces Pelt is --------- | | CO2 | R | 1 |
| 4. | The hormone responsible for the maintenance of pregnancy is --------- | | CO3 | R | 1 |
| 5. | Peste des Petits Ruminants (PPR) is a viral disease affecting --------- | | CO6 | U | 1 |
| 6. | Castrated male sheep is called as --------- | | CO2 | R | 1 |
| 7. | Nili-Ravi is a breed of --------- | | CO2 | U | 1 |
| 8. | The breed of goat that gives Pashmina, a high quality animal fibre is --- | | CO2 | R | 1 |
| 9. | The act of parturition in pig is called --------- | | CO3 | U | 1 |
| 10. | Heaviest breed of Indian buffalo having horns that are inclined to droop at each side of the neck is --------- | | CO2 | U | 1 |
| 11. | Metabolic disease caused due to the deficiency of serum calcium level in cattle is --------- | | CO6 | U | 1 |
| 12. | An example of a monogastric or simple stomached animal is --------- | | CO4 | R | 1 |
| 13. | Feeding of extra concentrate to ewes prior to the onset of breeding season is known as --------- | | CO4 | R | 1 |
| 14. | Disease caused by the bacteria *Brucella abortus* in adult cattle is -------- | | CO6 | R | 1 |
| 15. | Anthrax is a serious infectious disease caused by the bacteria --------- | | CO6 | U | 1 |
| 16. | Immobility response is a method of estrus detection in --------- | | CO3 | R | 1 |
| 17. | Give an example of a leguminous fodder crop. | | CO4 | U | 1 |
| 18. | The removal of horn buds in calves less than 8 weeks of age is known as --------- | | CO5 | R | 1 |
| 19. | Foot and Mouth Disease (FMD) is a highly contagious disease of livestock caused by --------- | | CO6 | U | 1 |
| 20. | Which breed of goat produces mohair? | | CO2 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What is Zoonosis and give 4 examples of zoonotic diseases that can be transmitted from animals to man? | | CO6 | An | 5 |
| 22. | Name and describe the characteristics of five indigenous breeds of poultry. | | CO2 | U | 5 |
| 23. | State the importance and the functions of water in animal nutrition. | | CO3 | An | 5 |
| 24. | Describe the important characteristics of common pet birds like Parakeet, Cockatiel, Dove, African Grey Parrot and Finches. | | CO4 | U | 5 |
| 25. | What are the differences between hay and silage? | | CO5 | An | 5 |
| 26. | What is dry period and what is the importance of dry period in cattle and buffalo? | | CO6 | U | 5 |
| 27. | What is biosecurity and what are the common biosecurity measures in livestock farm? | | CO1 | An | 5 |
| 28. | Explain the different stages of parturition in cow. | | CO2 | U | 5 |
| 29. | What is bloat, what are the causes of bloat and how do you manage bloat in ruminants? | | CO3 | An | 5 |
| 30. | Explain the care and management of pregnant and lactating animals. | | CO4 | U | 5 |
| 31. | Explain the cause, types, symptoms, diagnosis and prevention of rabies in animals. | | CO5 | An | 5 |
| 32. | What are the nutritional deficiency diseases of poultry? | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What are the steps in clean milk production? | CO1 | U | 8 |
|  | b. | Explain the methods employed in animal breeding. | CO3 | E | 7 |
| 34. | a. | Explain the structure of a chicken egg and draw and label the parts. | CO2 | A | 8 |
|  | b. | Describe the different types of housing system in livestock. | CO5 | U | 7 |
| 35. | a. | Describe the digestive system of chicken and draw a labelled diagram. | CO4 | A | 8 |
|  | b. | Draw a chart showing the vaccination schedule for broilers and layers. | CO6 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Know the importance of farm animals and its influence in rural economy. |
| CO2 | Distinguish the characteristics of indigenous and exotic breeds of cattle, goat, buffalo, swine and poultry. |
| CO3 | Select quality breeds of livestock and poultry. |
| CO4 | Choose nutritious feed rations and feeding of livestock and poultry. |
| CO5 | Set up proper housing for farm animals and poultry. |
| CO6 | Management of the common diseases of farm animals and birds. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 7.5 |  | 5 |  |  | 12.5 |
| CO2 | 3 | 10 | 7.5 |  |  | 3 | 23.5 |
| CO3 | 3 | 1 |  | 10 | 7.5 |  | 21.5 |
| CO4 | 2 | 10 | 7.5 |  |  | 1 | 20.5 |
| CO5 | 1 | 7.5 |  | 10 |  |  | 18.5 |
| CO6 | 8.5 | 15 |  | 5 |  |  | 28.5 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2452** | **Duration** | **3hrs** |
| **Course Name** | **FARM MACHINERY AND POWER** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name the pin used to join the connecting rod to the piston. | | CO1 | U | 1 |
| 2. | What is the depth of ploughing of chisel plough? | | CO1 | R | 1 |
| 3. | Name the part of IC engine which stores energy during power stroke and returns back the same energy during the idle strokes. | | CO1 | R | 1 |
| 4. | What is the formula to find Indicated Horse Power for four stroke engine? | | CO2 | R | 1 |
| 5. | Name the device used to connect and disconnect the tractor engine from the transmission gears and drive wheels. | | CO2 | U | 1 |
| 6. | Name the two types of piston rings. | | CO2 | R | 1 |
| 7. | What is the maximum power (hp) a pair of bullock can develop for doing a farm work? | | CO3 | U | 1 |
| 8. | Define Tilt angle. | | CO3 | R | 1 |
| 9. | Define Stroke. | | CO3 | U | 1 |
| 10. | What is the purpose the Camshaft? | | CO4 | U | 1 |
| 11. | List the sources of farm power. | | CO4 | U | 1 |
| 12. | What is the purpose of share in a mould board plough? | | CO4 | R | 1 |
| 13. | Which type of tractor, otherwise called as walking type tractor? | | CO5 | R | 1 |
| 14. | What is the calorific value of petrol? | | CO5 | R | 1 |
| 15. | Name any four parts of an IC engine. | | CO6 | U | 1 |
| 16. | Define tillage. | | CO6 | R | 1 |
| 17. | What should be the disc angle for good plough? | | CO6 | U | 1 |
| 18. | List the primary tillage implements. | | CO1 | R | 1 |
| 19. | Which was the first tractor company established in India? | | CO2 | U | 1 |
| 20. | What is the compression ratio of petrol engine? | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Elaborate the Power transmission system of a tractor. | | CO1 | An | 5 |
| 22. | List the advantages of using disc plough. | | CO2 | U | 5 |
| 23. | Explain the working principle and basic components of hydraulic system of tractor with a neat sketch. | | CO3 | E | 5 |
| 24. | Compare the merits and demerits of different forms of power (Animal, Mechanical and Electrical) | | CO4 | U | 5 |
| 25. | Discuss the formulae for finding all the Variable Cost of farm machinery. | | CO5 | An | 5 |
| 26. | Discuss the working of air cooling system. | | CO6 | U | 5 |
| 27. | Explain the working of Carburetor. | | CO1 | An | 5 |
| 28. | Compare the working of Two stroke and Four stroke IC engines. | | CO2 | U | 5 |
| 29. | Discuss the different types of Lubrication system. | | CO3 | An | 5 |
| 30. | Compare the working of diesel and petrol engine. | | CO4 | U | 5 |
| 31. | Explain the working principle and basic components of hydraulic system of tractor with a neat sketch. | | CO5 | An | 5 |
| 32. | Describe the importance of different components of IC engine. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Calculate BHP of a 4 stroke 4 cylinder IC engine having the following dimensions a) Cross section of piston (A)100 cm2  b) Stroke length (L) 120 mm c) Crankshaft speed (N) 1300 rpm  d) Friction horse power 22.51 hp e) Mean effective pressure  (P) 6.246 kg/cm2. | CO1 | E | 8 |
|  | b. | Classify the tractors based on purpose of use and explain briefly. | CO1 | An | 7 |
| 34. | a. | Explain in detail about the Fuel system of diesel engine. | CO3 | U | 8 |
|  | b. | Discuss in detail about the mould board plough. | CO2 | U | 7 |
| 35. | a. | Discuss the formulae for finding all the Fixed Cost of farm machinery. | CO4 | U | 8 |
|  | b. | Classify the cooling system and explain briefly the water cooling system. | CO6 | U | 7 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | The students will understand the various farm machineries. |
| CO2 | The students will gain knowledge about the use of farm machines. |
| CO3 | The students will understand the working of on working of equipment’s. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 11 | - | - | 15 | 17.5 | 15 | 58.5 |
| CO2 | 8 | - | - | 5 | - | 20 | 33 |
| CO3 | 1 | - | - | 5 | 15 | 12.5 | 33.5 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG2551** | **Duration** | **3hrs** |
| **Course Name** | **AGRI INFORMATICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | What is ITC e-Choupal? | | | CO1 | R | 1 |
| 2. | What is Agricultural Technology Information Centre? | | | CO3 | R | 1 |
| 3. | IVRS stands for \_\_\_\_\_\_\_\_\_\_. | | | CO1 | R | 1 |
| 4. | Name the Non-Profit Organization working on participatory video production? | | | CO1 | R | 1 |
| 5. | When was the Kisan Call Centres (KCC) scheme launched by the Ministry of Agriculture? | | | CO1 | R | 1 |
| 6. | Define Agricultural Information System. | | | CO3 | R | 1 |
| 7. | UPI stands for \_\_\_\_\_\_\_. | | | CO4 | R | 1 |
| 8. | Expand AGMARKNET. | | | CO1 | R | 1 |
| 9. | SMS Portal was inaugurated by the Hon’ble President of India on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO3 | R | 1 |
| 10. | Name the example crop for Corner's Model. | | | CO2 | U | 1 |
| 11. | What is the Toll-free number of Kisan Call Centre? | | | CO1 | R | 1 |
| 12. | Who is the scientist behind the experimental project “Hole in the Wall”? | | | CO3 | R | 1 |
| 13. | What is aAQUA? | | | CO1 | U | 1 |
| 14. | The water requirement for banana is \_\_\_\_\_\_\_\_\_ mm. | | | CO3 | R | 1 |
| 15. | What is a Green SIM? | | | CO4 | U | 1 |
| 16. | Who is considered as the father of expert systems? | | | CO1 | R | 1 |
| 17. | The first expert system ever developed is named as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO6 | R | 1 |
| 18. | Solar radiation is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | CO6 | R | 1 |
| 19. | Information Village Project was an ICT initiative of which non-profit organization? | | | CO1 | U | 1 |
| 20. | The water requirement for maize is \_\_\_\_\_\_\_\_ mm. | | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | What is Agriculture Expert System? Give three examples. | | | CO6 | U | 5 |
| 22. | What is Evapotranspiration? Mention different methods of its estimation. | | | CO3 | U | 5 |
| 23. | What is Contingency Crop Plan? List out the weather-related contingency plan. | | | CO5 | U | 5 |
| 24. | What are computer models? Mention different types of models with examples. | | | CO3 | U | 5 |
| 25. | What is the Fisher Friend Mobile Advisory app? | | | CO4 | U | 5 |
| 26. | Write a note on function of Kisan Call Centers (KCCs). | | | CO4 | U | 5 |
| 27. | Describe Geographic Information System (GIS). List out the various technologies comes under GIS | | | CO4 | U | 5 |
| 28. | Write a short note on activities of Digital Green. | | | CO1 | U | 5 |
| 29. | What is Minimum Data Set? Describe various parameters of Minimum Data Sets. | | | CO1 | U | 5 |
| 30. | Describe the role of ICTs in Water Management. | | | CO2 | U | 5 |
| 31. | Write a short note on e-Sagu project. | | | CO3 | U | 5 |
| 32. | Write a note on Automated Irrigation Systems using computer controlled devices. | | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | What is a Decision Support System? Write the history of DSS. | CO6 | U | 3 |
|  | | b. | Give the classification of DSS according to Relationship and write the Taxonomies according to Daniel Power. List the DSS applied in different areas of agriculture. | CO6 | A | 12 |
| 34. | | a. | Explain the importance of ICT application in Agriculture. | CO5 | U | 3 |
|  | | b. | Write a detailed note on any FOUR ICT initiatives/ projects you know in the country. | CO5 | A | 12 |
| 35. | | a. | What is Geospatial Technology? Explain the role in Agriculture. | CO2 | U | 5 |
|  | | b. | Explain different tools of Geospatial Technology. | CO2 | U | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand use of information, communication and technology (ICT) in agriculture. |
| CO2 | Demonstrate use of GIS and GPS systems in precision agriculture. |
| CO3 | Develop computerized models to understand plant growth process. |
| CO4 | Use smartphone for farm advice, farm prices and post-harvest management. |
| CO5 | Manage input requirements for crops and animals. |
| CO6 | Use Agriculture Expert system and Soil Information Systems for farm decisions. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 7 | 12 | 0 | 0 | 0 | 0 | 19 |
| CO2 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| CO3 | 6 | 15 | 0 | 0 | 0 | 0 | 21 |
| CO4 | 1 | 16 | 0 | 0 | 0 | 0 | 17 |
| CO5 | 0 | 8 | 12 | 0 | 0 | 0 | 20 |
| CO6 | 2 | 13 | 0 | 12 | 0 | 0 | 27 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3001** | **Duration** | **3hrs** |
| **Course Name** | **MODERN CONCEPTS IN CROP PRODUCTION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | The earlier growth of plant producing leaves, stem and branches without flowers is called ……………... | | | CO1 | U | 1 |
| 2. | ………………planting is also called as rectangular system of planting. | | | CO2 | R | 1 |
| 3. | ………….. in wheat and ……… in rice are the sources of dwarfing genes. | | | CO2 | R | 1 |
| 4. | Good quality seeds of improved varieties ensure higher yield at least by ------------- %. | | | CO6 | E | 1 |
| 5. | ………….is the model plant type that performs best when the plants are space-planted | | | CO2 | U | 1 |
| 6. | …………….is the number of plants per unit area in a cropped field. | | | CO2 | R | 1 |
| 7. | …………is defined as the successful management of resources to satisfy changing human needs while maintaining the quality of the environment and conserving natural resources. | | | CO6 | U | 1 |
| 8. | What is LGP …………. | | | CO2 | R | 1 |
| 9. | The increase of dry weight by a unit area of the crop in a unit time expressed as g / m2/ day is ------------ growth rate | | | CO1 | U | 1 |
| 10. | …………nutrient imparts resistance to lodging by increasing the stem thickness and crushing strength. | | | CO2 | U | 1 |
| 11. | --------------- is the land unit on earth’s surface, carved out of agro climatic region by superimposing climate on landforms & soils. | | | CO2 | U | 1 |
| 12. | --------------- is a set of concepts and equations by which changes in size of plants over time can be summarized in component variables. | | | CO1 | R | 1 |
| 13. | LEISA………………. | | | CO6 | R | 1 |
| 14. | ……………. is the father of organic farming | | | CO6 | R | 1 |
| 15. | What is high –tech farming | | | CO6 | R | 1 |
| 16. | GAP…………… | | | CO6 | R | 1 |
| 17. | The complimentary use of chemical fertilizers, organic manures, bio-fertilizers, crop residues and green manuring is referred to as--------------nutrient management. | | | CO6 | U | 1 |
| 18. | The official logo of Govt. of India for organic certified product is “India ------------” | | | CO6 | R | 1 |
| 19. | One cubic meter of water is -------------------- litres. | | | CO6 | U | 1 |
| 20. | Crop rotation is a ----------------------- method of weed management. | | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | What are the agro-climatic zones of Tamil Nadu and describe their characters? | | | CO1 | R | 5 |
| 22. | Discuss about different crop geometries are available for crop production | | | CO2 | C | 5 |
| 23. | Brief about ion uptake mechanism by plants | | | CO3 | An | 5 |
| 24. | What are the parameters are available for analyzing the crop growth with brief description? | | | CO1 | R | 5 |
| 25. | What are the steps involved in organic farming certification process? | | | CO6 | R | 5 |
| 26. | Brief about basic ecological principles and promising techniques of LEISA. | | | CO6 | An | 5 |
| 27. | Write about important steps for establishing optimum plant density. | | | CO2 | R | 5 |
| 28. | Define drip fertigation and explain the equipments, types of fertilizers and fertilizer use efficiency in drip fertigation. | | | CO6 | C | 5 |
| 29. | Brief about steps involved in development of ideotype breeding | | | CO2 | An | 5 |
| 30. | Explain about different irrigation methods. | | | CO6 | U | 5 |
| 31. | Briefly explain problems associated with present system of plant nutrition. | | | CO3 | An | 5 |
| 32. | Define minimum tillage and explain its advantages and disadvantages. | | | CO5 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Explain the various precautions to be taken while shifting to organic farming. | CO6 | U | 7.5 |
|  | | b. | Discuss the environmental stresses experienced by the crops and their effects. | CO3 | C | 7.5 |
| 34. | | a. | Mention about factors affecting nutrient availability to plants. | CO3 | E | 7.5 |
|  | | b. | Write about different soil fertility evaluation techniques. | CO4 | R | 7.5 |
| 35. | |  | Write about alternate forms of agriculture and their characteristics. | CO6 | R | 15 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the crop production techniques and crop growth in relation to environment. |
| CO2 | Address various factors affecting crop production and yield. |
| CO3 | Know the effective ways of soil and nutrient management. |
| CO4 | Recognize and identify effective ways to overcome the environmental stresses affecting crop growth and yield. |
| CO5 | Learn the ways for effective utilization of farm resources, diversification of crop productions and maximizing the farm income. |
| CO6 | Gain knowledge on new technologies and trends in agriculture for maximizing crop yield and farm income in a sustainable way. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 11 | 2 | - | - | - | - | 13 |
| CO2 | 9 | 3 | - | 5 | - | 5 | 22 |
| CO3 | - | - | - | 10 | 7.5 | 7.5 | 25 |
| CO4 | 7.5 | - | - | - | - | - | 7.5 |
| CO5 | 5 | - | - | - | - | - | 5 |
| CO6 | 26 | 15.5 | - | 5 | 1 | 5 | 52.5 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3002** | **Duration :** | **3hrs** |
| **Course Name** | **PRINCIPLES AND PRACTICES OF SOIL FERTILITY AND NUTRIENT MANAGEMENT** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **CO/BL** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | |
| 1. | Write the formula to for fertilizer use efficiency. | CO1 / R | 1 |
| 2. | Name the costliest fertilizer in India. | CO2 / U | 1 |
| 3. | Which is the cheapest fertilizer available in India and why ? | CO2/ U | 1 |
| 4. | Name the chemical responsible for scorching in urea with its content. | CO1 / R | 1 |
| 5. | Name two crops which prefer ammonical form than nitrate. | CO2 / A | 1 |
| 6. | Give different methods of fertilizes application. | CO1 / E | 1 |
| 7. | Name the soil enzyme responsible for urea conversation to ammonium carbonate. | CO3 / R | 1 |
| 8. | What is vermicompost and give its nutrient composition ? | CO2/ AN | 1 |
| 9. | What is fertilizer grade and give with an example ? | CO3/ U | 1 |
| 10. | Define fustigation and its merits ? | CO3 / R | 1 |
| 11. | List out the factors affecting soil productivity | CO2 / U | 1 |
| 12. | What is the forms of nitrogen uptake by crop plants? | CO1/ A | 1 |
| 13. | Define organic farming. | CO3 / A | 1 |
| 14. | Why rock phosphate is recommended for acid soils? | CO2 / AN | 1 |
| 15. | List out the different methods of nitrogen losses | CO2 /U | 1 |
| 16. | What is the optimum C:N ratio for soil ? | CO3 / R | 1 |
| 17. | Mention the merits of foliar application in pulses | CO2 / U | 1 |
| 18. | Why organic manures are called as bulky? | CO3 / R | 1 |
| 19. | List out the different methods of nitrogen losses | CO2/ E | 1 |
| 20. | Define soil fertility. | CO3 / E | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Write the differences between soil fertility and productivity. | CO4 / C | 5 |
| 22. | Write different oilcakes and its nutrient composition | CO4 / E | 5 |
| 23. | Write the importance of soil pH in nutrient availability | CO3 / U | 5 |
| 24. | Calculate the quantity of urea ,single superphosphate and muriate of potash for the fertilizer level of 100:50:40 kg NPK | CO4 / R | 5 |
| 25. | Write the deficiency symptoms of calcium, potassium and nitrogen and correction measures | CO4 / A | 5 |
| 26. | What is a mixed fertilizer? Give an example and merits of it. | CO5/ A | 5 |
| 27. | Classify N, P and K nutrients available as per soil testing | CO5 / C | 5 |
| 28. | Mention the role of sulphur in crop plants | CO5/ E | 5 |
| 29. | Write the different steps in compost preparation and its merits over fertilizes | CO6/ R | 5 |
| 30. | What is a bio fertilizer ? Give its importance in agriculture | CO6 / U | 5 |
| 31. | List out the differences between green manure and Greenleaf manure with suitable examples. | CO5 / U | 5 |
| 32. | What is Arnon criteria essentiality? | CO6 /E | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Give a detailed account on C:N ratio in with suitable figure. | CO5 / R | 8 |
| b. | Write the importance of zinc in rice production. | CO5 / U | 7 |
| 34. | a. | List out the different methods to increase the fertilizer use efficiency | CO6 / U | 7 |
| b. | What is nutrient transformation? Write potassium transformation and its importance. | CO6 / A | 8 |
| 35. | a. | Define Integrated Nutrient Management. | CO4 / A | 8 |
| b. | Write the different methods in integrated nutrient management for field crops. | CO5/ C | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the importance of soil fertility management and crop growth. |
| CO2 | Know the role of various nutrients in crop growth and yield. |
| CO3 | Recognize the composition of various chemical fertilizers and could recognize its impacts in crop production. |
| CO4 | Derive a thorough knowledge on various organic manure productions and its application. |
| CO5 | Develop a holistic knowledge on sustainable nutrient management practices for sound farming ecosystem. |
| CO6 | Learn the methodologies for determining the soil nutrient levels and the crop nutrient uptake. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | - | 1 | - | 1 | - | 4 |
| CO2 | - | 5 | 1 | 2 | 1 | - | 9 |
| CO3 | 4 | 2 | 1 | - | 1 | - | 12 |
| CO4 | 1 | - | - | 3 | 1 | 1 | 28 |
| CO5 | 1 | 2 | 1 | - | 1 | 2 | 42 |
| CO6 | 1 | 2 | 1 | - | 1 | - | 30 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3003** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES AND PRACTICES OF WEED MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | An unwanted plant, growing where it is not desired is \_\_\_\_\_\_\_\_ | | CO2 | U | 1 |
| 2. | Such weeds, that are grown in cultivated field is \_\_\_\_\_\_ | | CO1 | U | 1 |
| 3. | Cropped along with wild land weed are known as \_\_\_\_\_\_\_ | | CO1 | R | 1 |
| 4. | Problematic weed, whose seed once mixed with crop seed is extremely difficult to separate is \_\_\_\_\_\_\_ | | CO2 | U | 1 |
| 5. | Undesirable, troublesome weed difficult to control is \_\_\_\_\_\_ | | CO1 | R | 1 |
| 6. | Mimicry weeds of rice and wheat is \_\_\_\_\_\_\_ | | CO3 | U | 1 |
| 7. | Weed that depends for its growth on its host plant. | | CO4 | U | 1 |
| 8. | Semi root parasitic weed of Sorghum and Sugarcane. | | CO3 | U | 1 |
| 9. | The example of POST herbicides are-------- | | CO3 | U | 1 |
| 10. | The total root parasitic weed of Tobacco. | | CO2 | R | 1 |
| 11. | First biologically controlled weed is\_\_\_\_\_\_. | | CO4 | R | 1 |
| 12. | The off type crop varieties are \_\_\_\_\_\_. | | CO5 | R | 1 |
| 13. | Which of the following stages of a crop are more prone to weed competition? | | CO4 | R | 1 |
| 14. | What is the trade name of Glyphosate? | | CO2 | R | 1 |
| 15. | What is the Critical Period of Crop-Weed Competition for Upland rice condition? | | CO4 | U | 1 |
| 16. | BIPOLARIS is used to control weed---------. | | CO1 | U | 1 |
| 17. | The detrimental effect of one of higher plants on other higher plants is known as \_\_\_\_\_\_\_\_. | | CO2 | An | 1 |
| 18. | The practice of flushing out germinable weed seeds before crop sowing is called \_\_\_\_\_\_\_\_\_. | | CO5 | An | 1 |
| 19. | The herbicides applied 1-4 days after sowing are comes under \_\_\_\_\_\_. | | CO2 | A | 1 |
| 20. | 2, 4-D, Simazine, Atrazine and Fluchloralin belongs to the selectivity group. | | CO1 | E | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Differentiate Weed management vs weed control. | | CO4 | U | 5 |
| 22. | Define biological weed management. | | CO4 | R | 5 |
| 23. | Explain the common weed dispersal agents. | | CO1 | R | 5 |
| 24. | Describe Crop Weed Competition in details with suitable example. | | CO2 | U | 5 |
| 25. | State the importance of weed seed bank. | | CO2 | An | 5 |
| 26. | Enlist the factors responsible for herbicide resistance and suggest management strategies. | | CO3 | C | 5 |
| 27. | Write about Invasive weeds. | | CO3 | U | 5 |
| 28. | Describe Critical crop-weed competition period. | | CO2 | R | 5 |
| 29. | Describe the Classification of aquatic weeds. | | CO1 | U | 5 |
| 30. | State the importance of allelopathy in weed management. | | CO4 | An | 5 |
| 31. | Explain Weed management in "SRl" cultivation. | | CO4 | A | 5 |
| 32. | Write a note on Adjuvant. | | CO5 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Describe in detail the classification and characteristic of weeds. | CO1 | U | 7 |
|  | b. | What do you mean by Weed Biology? Discuss the weed characteristics which help in weed persistence. Write in short about Weed Seed Dormancy. What are the preventive methods of weed management? | CO3 | An | 8 |
|  |  |  |  |  |  |
| 34. | a. | Write short notes on the following:   1. Crop weed association. 2. Management strategies of parthenium. | CO1 | E | 6.5 |
|  | b. | Discuss about the weed –management of rice. | CO5 | R | 8.5 |
|  |  |  |  |  |  |
| 35. | a. | Discuss the Problematic weeds and their control. | CO4 | A | 8 |
|  | b. | Write the short notes on the following   1. Integrated weed management. 2. Allelopathic effect of weeds. | CO5 | R | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Identify different types of weeds and their ecosystem. |
| CO2 | Understand the weeds survival mechanisms. |
| CO3 | Recommend herbicides for weed management in field crops. |
| CO4 | Adopt different weed control methods for crop production. |
| CO5 | Apply integrated weed management practices. |
| CO6 | Work out the economics of weed control |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 7 | 14 | - | - | 7.5 | - | 28.5 |
| CO2 | 7 | 7 | 1 | 6 | - | - | 21 |
| CO3 | - | 8 | - | 8 | - | 5 | 21 |
| CO4 | 12 | 2 | 18 | 5 | - | - | 37 |
| CO5 | 16.5 | - | - | 1 | - | - | 17.5 |
| CO6 | - | - | - | - | - | - | - |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG3004** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES AND PRACTICES OF WATER MANAGEMENT** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Average annual rainfall of India is -------------- cm. | | CO1 | U | 1 |
| 2. | An area of land where all water drains to a central point like a lake, river, or stream is known as ----------------------. | | CO1 | R | 1 |
| 3. | A productive soil contains approximately 45 % mineral particles, ------ % organic matter and 25 % air and 25 % water on volume basis. | | CO1 | R | 1 |
| 4. | Field capacity is the ------------------- limit of soil moisture available to plants. | | CO1 | An | 1 |
| 5. | In a normal soil with good aeration and without restrictive layers, a greater portion of roots of most plants remains within 45 to----- cm surface soil layer. | | CO | A | 1 |
| 6. | ET + water used for metabolic activities of plants is termed as ----------------------- use of water. | | CO2 | E | 1 |
| 7. | Reference crop ET (ETo ) = ------------ x Kpan. | | CO2 | An | 1 |
| 8. | FAO ----------------- - Monteith method” is the most standard method of estimating ET. | | CO2 | U | 1 |
| 9. | ------------------ is the cheapest source of natural water for crop growth. | | CO3 | R | 1 |
| 10. | ------- irrigation requirement is the amount of irrigation water just required to bring the soil moisture content in the root zone depth of the crop to field capacity. | | CO3 | A | 1 |
| 11. | If net irrigation requirement is 500 mm and irrigation efficiency of the system is 80 %, the gross irrigation requirement is --------- mm. | | CO4 | An | 1 |
| 12. | If 1.0 cm of water is to be applied in 1.0 ha of cropped land --------litres of water is needed. | | CO5 | An | 1 |
| 13. | Irrigating in the field after it is laid out into long, narrow strips, bordering with small bunds is known as --------- strip irrigation. | | CO3 | R | 1 |
| 14. | ------------- irrigation is the application of water into the furrows intermittently in a series of relatively short ON and OFF times of irrigation cycle. | | CO3 | U | 1 |
| 15. | ------------- is connected to the drip unit to inject dissolved fertilizers into the water in the drip unit. | | CO5 | U | 1 |
| 16. | -------------- irrigation system is a combination of a drip irrigation and sprinkler system. | | CO5 | R | 1 |
| 17. | International Water Management Institute has proposed a change of the nomenclature from ‘water use efficiency’ to ‘water ------------------. | | CO4 | A | 1 |
| 18. | Most important critical stage for irrigation in wheat crop is ---------. | | CO5 | R | 1 |
| 19. | ------------------ requirement is defined as the fraction of the irrigation water that must be percolated out of the bottom of the root zone in order to prevent average soil salinity from rising above some specifiable level. | | CO6 | U | 1 |
| 20. | Water logging is caused in a location when the inflow of water into it exceeds the outflow resulting in progressive rise of ------------- table. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define irrigation. What are the benefits of irrigation? | | CO2 | C | 5 |
| 22. | Calculate the depth of irrigation (cm) in wheat crop from the following parameters. Effective root zone depth = 60 cm, DASM allowable = 50%,  FC= 28 %, PWP = 12 %, BD = 1.35g/cm3. | | CO3 | E | 5 |
| 23. | Explain scheduling of irrigation based on IW/CPE ratio. | | CO3 | E | 5 |
| 24. | Find out CPE for scheduling irrigation in a crop of sugarcane, if ideal IW/CPE ratio is 0.8 and IW is 40 mm. | | CO3 | An | 5 |
| 25. | Write a short note on Border strip irrigation. | | CO3 | U | 5 |
| 26. | List out the advantages of drip irrigation. | | CO3 | R | 5 |
| 27. | Write a short note on fertigation. | | CO5 | U | 5 |
| 28. | Write a short note on water productivity. | | CO4 | C | 5 |
| 29. | Explain the water management practices for sugarcane crop. | | CO5 | A | 5 |
| 30. | Explain the improvement of saline and sodic soils through water management. | | CO6 | A | 5 |
| 31. | Explain the systems of irrigation in polyhouses. | | CO5 | C | 5 |
| 32. | What is the reason for salinity of water and explain the water quality classes based on EC by USDA? | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | List out the effects of water stress on plants. | CO1 | E | 8 |
|  | b. | Briefly explain the steps for managing drought stress. | CO1 | An | 7 |
|  |  |  |  |  |  |
| 34. | a. | Define drip fertigation. Explain the fertilizers used for drip fertigation. | CO5 | U | 8 |
|  | b. | Briefly explain about bubbler and pitcher irrigations. | CO3 | R | 7 |
|  |  |  |  |  |  |
| 35. | a. | Define leaching requirement (LR)?. Calculate LR and total depth of water needed to meet both the crop demand and LR (AW) for a maize crop from following parameters. ECw =1.2 dS/m, ECe =2.5 dS/M, ET=800 mm. Irrigation efficiency- 75 %. Explain the results also. | CO6 | C | 8 |
|  | b. | What are the reasons for water logging? Explain the surface drainage methods. | CO6 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the role of water in crop production, soil moisture - forms, movement, retention, constants, water resources of India and TN. |
| CO2 | Know the water requirement of crops- its estimation, effect of moisture stress on plant growth. |
| CO3 | Study scheduling of irrigation and different methods of irrigation and their layout. |
| CO4 | Study ways to improve water use efficiency, irrigation efficiency. |
| CO5 | Understand water management practices in different crops, drip fertigation. |
| CO6 | Study quality of irrigation water, water management in problem soils and drainage of excess water from crop fields. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 2 | 1 | - | 8 | 8 | - | 19 |
| CO2 | 5 | 1 | 1 | 1 | 1 | - | 9 |
| CO3 | 15 | 6 | 1 | 5 | 10 | - | 37 |
| CO4 | - | - | 1 | 1 | - | 5 | 7 |
| CO5 | 2 | 13 | 5 | 1 | - | 5 | 26 |
| CO6 | 6 | 1 | 12 | - | - | 8 | 27 |
| Total | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG3005** | **Duration** | **3hrs** |
| **Course Name** | **AGRO-METEOROLOGY AND CROP WEATHER FORECASTING** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define weather. | | CO2 | R | 1 |
| 2. | Father of Agricultural Meteorology in India is -------------. | | CO1 | R | 1 |
| 3. | List out the different layers of atmosphere. | | CO1 | R | 1 |
| 4. | Expand IMD. | | CO2 | A | 1 |
| 5. | -------is a line drawn on a map connecting points that receive equal amounts of rainfall in a given period. | | CO3 | U | 1 |
| 6. | If there is no atmosphere, the day temperature will be -------and night temperature will be---------. | | CO3 | U | 1 |
| 7. | GDD formula? | | CO5 | R | 1 |
| 8. | Which layer is called as “Seat of Photochemical reactions”? | | CO3 | R | 1 |
| 9. | Define cardinal temperature. | | CO5 | U | 1 |
| 10. | Expand CRIDA. | | CO5 | U | 1 |
| 11. | The wind which flows from mountain to down slope is called as---------- | | CO6 | R | 1 |
| 12. | --------- scale is an empirical measure that relates wind speed to observed conditions at sea or land. | | CO4 | A | 1 |
| 13. | The study of clouds is called as -------------. | | CO2 | A | 1 |
| 14. | If temperature increases then rate of evapotranspiration--------. | | CO6 | R | 1 |
| 15. | List out different types of droughts. | | CO4 | R | 1 |
| 16. | Define photomorphogenesis. | | CO5 | R | 1 |
| 17. | Name the satellite used in weather forecasting in India. | | CO2 | R | 1 |
| 18. | List out the weather hazards. | | CO5 | U | 1 |
| 19. | The clouds which bring rain is called as--------. | | CO5 | R | 1 |
| 20. | Define greenhouse gases. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Distinguish between weather and climate. | | CO1 | R | 5 |
| 22. | Define soil temperature and explain its role in crop production. | | CO2 | R | 5 |
| 23. | Define precipitation and its types. | | CO5 | U | 5 |
| 24. | Write about the benefits of weather services to agriculture. | | CO1 | U | 5 |
| 25. | List out the Indian satellites used for weather forecasting and explain in detail. | | CO3 | A | 5 |
| 26. | Explain about classification of clouds. | | CO3 | A | 5 |
| 27. | Write short note on a) Stratosphere b) Isotherms c) Sensible heat flux d) Diurnal variation e) Environmental lapse rate | | CO5 | R | 5 |
| 28. | Explain Temperature inversion and its types. | | CO4 | U | 5 |
| 29. | Explain about standard atmospheric pressure belt system. | | CO4 | U | 5 |
| 30. | Elaborate the process of cloud seeding mechanism with its merits and demerits. | | CO6 | A | 5 |
| 31. | Explain the factors affecting evaporation. | | CO3 | U | 5 |
| 32. | Explain about energy budget in the atmosphere. | | CO2 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the monsoon - mechanism with neat diagram. | CO2 | A | 7.5 |
|  | b. | Impact of climate change in agriculture - Discuss | CO3 | U | 7.5 |
| 34. | a. | Explain the crop insurance scheme in detail? | CO6 | U | 7.5 |
|  | b. | What are the applications of agro meteorology in agriculture? | CO6 | U | 7.5 |
| 35. | a. | Explain about layering of atmosphere with neat diagram | CO1 | U | 7.5 |
|  | b. | Explain about standard atmospheric pressure belt system. | CO3 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the significance of agricultural meteorology, climate and weather. |
| CO2 | Know the various atmospheric weather variables and its significance in crop production. |
| CO3 | Perceive crop weather relationships for efficient crop production. |
| CO4 | Acquire knowledge on weather forecasting techniques. |
| CO5 | Gains hands-on knowledge on the functioning of agro-meteorological observatory. |
| CO6 | Address the effect of climate change on crop production. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 7 | 12.5 | - | - | - | - | 19.5 |
| CO2 | 7 | 5 | 9.5 | - | - | - | 21.5 |
| CO3 | 1 | 22 | 10 | - | - | - | 33 |
| CO4 | 1 | 10 | 1 | - | - | - | 12 |
| CO5 | 8 | 9 | - | - | - | - | 17 |
| CO6 | 2 | 15 | 5 | - | - | - | 22 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG3006** | **Duration** | **3hrs** |
| **Course Name** | **CROPPING SYSTEMS AND SUSTAINABLE AGRICULTURE** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Growing two or more crops simultaneously in different strips wide enough to permit independent cultivation but narrow enough for the crops to interact agronomically is termed as ----------------- | | CO1 | A | 1 |
| 2. | Yearly sequence and spatial arrangement of crops and fallow on a given area is called as -----------------. | | CO1 | U | 1 |
| 3. | Yield increase of one species over other is indicated by the -------------------index. | | CO2 | U | 1 |
| 4. | Plant ideotypes were proposed by -------------- | | CO3 | U | 1 |
| 5. | Cropping system which has the practice of growing different crops of varying height, rooting pattern and duration is called ………………. | | CO3 | A | 1 |
| 6. | Land Equivalent ratio > 1.0, indicates ----------- | | CO4 | A | 1 |
| 7. | ------------- is the study of the relation of agricultural crops and environment | | CO6 | A | 1 |
| 8. | Cropping Intensity values of <1, it indicates ---------- | | CO5 | A | 1 |
| 9. | Geometry of base crop is altered to introduce intercropping, in this the main crop population is same that of recommended population is called as --------------- | | CO6 | U | 1 |
| 10. | Intercropping is growing ---------- crops for obtaining increased yield | | CO5 | R | 1 |
| 11. | Mixed intercropping have ------------ arrangement | | CO2 | U | 1 |
| 12. | -------------------type of tillage, only the seed zone is tilled intensively and the inter space is not ploughed or ploughed once | | CO6 | U | 1 |
| 13. | Intercropping will increase the light interception of ---------------- % | | CO2 | A | 1 |
| 14. | Cropping intensity in India is ----------------% | | CO4 | A | 1 |
| 15. | CRIDA is located at -------------------------- | | CO6 | R | 1 |
| 16. | Direct or indirect harmful effect that one plant has on another through the production of chemical substances is called ………. | | CO2 | U | 1 |
| 17. | ----------------is the process of growing more number of crops on the same piece of land during the given period of time | | CO6 | U | 1 |
| 18. | ----------------- defined as any organic compounds, which are active at low concentrations in promoting, inhibiting or modifying growth and development. | | CO6 | R | 1 |
| 19. | …………defined as a biological model which is expected to perform or behave in a predictable manner within a defined environment. | | CO6 | U | 1 |
| 20. | …………….chemicals used to slows cell division and cell elongation of shoot tissue and regulate plant height physiologically without formative effects. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Mention the forms of multiple cropping systems with suitable examples. | | CO1 | A | 5 |
| 22. | Write in brief about the resource management in cropping systems. | | CO2 | R | 5 |
| 23. | Mention the predominant cropping systems for various agro- climatic zones of Tamil Nadu. | | CO2 | U | 5 |
| 24. | Briefly discuss the principles, concept and importance of cropping systems. | | CO1 | U | 5 |
| 25. | Briefly discuss about the low-cost technologies in sustainable agriculture. | | CO3 | U | 5 |
| 26. | Evaluation of crop diversification in irrigated uplands of Tamil Nadu-Explain. | | CO3 | A | 5 |
| 27. | Explain the organic farming concepts and principles in cropping system. | | CO4 | U | 5 |
| 28. | Explain the role of farming systems in sustainable agriculture. | | CO5 | A | 5 |
| 29. | Discuss about classification PGR and its role on Dryland agriculture. | | CO5 | U | 5 |
| 30. | Write about the dryland techniques for soil moisture conservation. | | CO6 | U | 5 |
| 31. | Allelopathic and Annidation Effects in Cropping Systems-Discuss. | | CO6 | A | 5 |
| 32. | Relate and discuss about soil organic matter and soil fertility in sustainable agriculture. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the agronomic requirements in the management of nutrient, water, weeds, pests and diseases in a cropping system . | CO1 | U | 8 |
|  | b. | Discuss the concepts and measures to reduce the external or purchased inputs usage in cropping systems through LEISA approach. | CO2 | A | 7 |
| 34. | a. | Explain the types of cropping systems with examples. What are the benefits realized in cropping systems? | CO2 | U | 8 |
|  | b. | Criteria for selection of crops and varieties for intensive cropping systems. | CO3 | A | 7 |
| 35. | a. | Briefly discuss about different types of tillage and land shaping. | CO4 | U | 8 |
|  | b. | Define sustainable agriculture and list out the principles, concept, objectives and components of sustainable agriculture. | CO5 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand different cropping systems and ways to effectively manage resources under different cropping systems. |
| CO2 | Develop deep insights on crop interactions under cropping systems. |
| CO3 | Gain knowledge on the importance of sustainable agriculture. |
| CO4 | Relate sustainable agriculture with conventional agriculture in a scientific manner. |
| CO5 | Imbibe knowledge on the importance of crop diversification and the sustainability of farm operations. |
| CO6 | Apply the knowledge of sustainable crop production in effectively guiding farmers. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 14 | 6 | - | - | - | 20 |
| CO2 | 5 | 16 | 8 | - | - | - | 29 |
| CO3 | - | 6 | 13 | - | - | - | 19 |
| CO4 | - | 13 | 2 | - | - | - | 15 |
| CO5 | 1 | 5 | 13 | - | - | - | 19 |
| CO6 | 3 | 14 | 6 | - | - | - | 23 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG3007** | **Duration** | **3hrs** |
| **Course Name** | **DRYLAND FARMING AND WATERSHED MANAGEMENT** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | **A natural hydrological unit having common runoff outlet point-------------.** | | CO4 | U | 1 |
| 2. | **The ratio of runoff to the volume of precipitation receive in a catchment area is known as …………** | | CO4 | R | 1 |
| 3. | **Micro watershed covers an area of about-----------.** | | CO6 | An | 1 |
| 4. | The Indian agriculture receives most of the rain from  (a) South – West Monsoon (b) South – East Monsoon (c) Equal rainfall from both sides (d) None of the above. | | CO5 | A | 1 |
| 5. | **Irrigation project covered >10,000 ha of catchments command area (CCA)** -----------. | | CO3 | U | 1 |
| 6. | What is contingent planning?  (a) Change in normal crop planning to meet weather abnormalities. (b) Change in normal crop planning to meet market demand. (c) Change in normal crop planning to meet disease free period. (d) None of the above. | | CO2 | A | 1 |
| 7. | When is crop plan suggested?  (a) Live saving irrigation at any time. (b) Lifesaving irrigation at the later stage of plant. (c) Lifesaving irrigation at only a critical growth stage. (d) Any of the above. | | CO3 | An | 1 |
| 8. | **Cultivation of crops in areas where average annual rainfall is <750 mm per annum-----------.** | | CO4 | U | 1 |
| 9. | **Most appropriate crops in dryland farming are---------.** | | CO1 | R | 1 |
| 10. | **Crop growing season of dryland farming is-------------.** | | CO2 | U | 1 |
| 11. | Define Ephemeral. | | CO4 | E | 1 |
| 12. | **The main important feature of Indian monsoon---------.** | | CO2 | A | 1 |
| 13. | **The chemical accumulated during drought condition.** | | CO4 | U | 1 |
| 14. | **Atrazine and PMA at low concentration act as -----------type of antitranspirents** | | CO6 | R | 1 |
| 15. | **The crop sown under condition of early onset of monsoon.** | | CO2 | C | 1 |
| 16. | **Which is accumulated in the leaves of water stressed plants.** | | CO4 | U | 1 |
| 17. | **The length of growing period, suitable for inter cropping system------------.** | | CO3 | R | 1 |
| 18. | **The moisture deficit condition, results when the amount of water vapour available in the soil is not sufficient to meet the demand of potential evapo-transpiration-------------.** | | CO5 | An | 1 |
| 19. | **The simplest way of adaptation of plant to drought is------------.** | | CO1 | A | 1 |
| 20. | **Which crop rotation under dryland situation will be more remunerative?** | | CO1 | E | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss major constraints and problems in dryland areas. | | CO1 | U | 5 |
| 22. | Define drought. Briefly describe impact of drought in agriculture. | | CO1 | U | 5 |
| 23. | Discuss crop planning pattern for aberrant weather condition. | | CO4 | R | 5 |
| 24. | Differentiate between 1. Hydrological drought 2. Meteorological drought. | | CO6 | An | 5 |
| 25. | Discuss briefly the concept, significance and dimension of dryland farming in Indian agriculture. | | CO2 | A | 5 |
| 26. | Explain land use classification | | CO3 | R | 5 |
| 27. | Describe importance of watershed management. | | CO5 | U | 5 |
| 28. | Explain the crop production in dryland farming system. | | CO3 | R | 5 |
| 29. | Explain the types of soil erosion. | | CO3 | U | 5 |
| 30. | Describe the Fertilizer use efficiency (FUE) in dryland agriculture. | | CO2 | A | 5 |
| 31. | Explain about alley cropping. | | CO3 | U | 5 |
| 32. | Briefly discuss about insitu soil moisture conservation | | CO2 | C | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Define drought. Explain impact of drought on farmers of dryland area. | CO1 | R | 7 |
|  | b. | Describe the progress of dryland Agricultural Research in India. | CO2 | U | 8 |
| 34. | a. | Discuss about tillage in drylands. | CO1 | An | 7.5 |
|  | b. | Briefly describe factor affecting soil erosion**.** | CO4 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain Fertilizer use in drylands. | CO3 | U | 7 |
|  | b. | Briefly describe the important components of watershed management programme. | CO6 | R | 8 |

CO – COURSE OUTCOME BL – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | COURSE OUTCOMES |
| CO1 | Understand sustainable agriculture practices under dryland conditions. |
| CO2 | Correlate soil and climatic conditions of drylands for successful crop production. |
| CO3 | Explain the various crop management techniques and the adaptation strategies for dryland agriculture. |
| CO4 | Formulate contingent water planning for aberrant weather conditions. |
| CO5 | Learn the different types of watershed management strategies. |
| CO6 | Apply the knowledge of different water conservation methods and water management strategies for dryland farming. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment Pattern as per Bloom’s Taxonomy | | | | | | | |
| CO / P | R | U | A | An | E | C | Total |
| CO1 | 1,7 | 5,5 | 1 | 7.5 | 1 |  | 27.5 |
| CO2 |  | 1,8 | 1,1,5,5 |  |  | 1,5 | 27 |
| CO3 | 1,5,5 | 1,5,5,7 |  | 1 |  |  | 30 |
| CO4 | 1,5, | 1,1,1,1 | 7.5 |  | 1 |  | 18.5 |
| CO5 | 5 |  | 1 | 1 |  |  | 7 |
| CO6 | 1,8 |  |  | 1,5 |  |  | 15 |
|  | | | | | | | 125 |



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| **Course Code** | **21AG3008** | **Duration** | **3hrs** |
| **Course Name** | **AGRONOMY OF MAJOR CEREALS AND PULSES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | | |
| 1. | Tassel refers to the \_\_\_\_ flower of a corn plant. | | | CO1 | R | 1 |
| 2. | \_\_\_\_\_\_\_\_\_\_ protein in wheat is responsible for its the unique elasticity and stickiness, which makes it so useful in bread making. | | | CO6 | R | 1 |
| 3. | \_\_\_\_\_\_\_ represent the female flower of maize | | | CO1 | A | 1 |
| 4. | The recommended dose of FYM /ha is \_\_\_\_\_\_\_\_ . | | | CO6 | A | 1 |
| 5. | Wild oat is a major weed in \_\_\_\_\_\_\_\_\_ crop. | | | CO1 | R | 1 |
| 6. | "Bio-control agents are compatible with bio-fertilizers". Is this statement correct or incorrect? | | | CO6 | R | 1 |
| 7. | \_\_\_\_\_\_ fertilizer applied to prevent root snapping problem in the paddy nursery while pulling out the paddy seedlings. | | | CO6 | A | 1 |
| 8. | Which stage is the first indication for rice crop entering into reproductive state? | | | CO5 | R | 1 |
| 9. | Carbendazim is used for \_\_\_\_\_\_\_\_ purpose. | | | CO2 | An | 1 |
| 10. | Name the pulse crop which is remarked as a “WONDER CROP”, because of its high protein and oil contents. | | | CO1 | R | 1 |
| 11. | \_\_\_\_\_ kg/ha is the recommended seed rate for SRI method of paddy cultivation. | | | CO3 | An | 1 |
| 12. | CIMMYT is located in Mexico is known as \_\_\_\_\_\_\_\_\_\_\_\_ | | | CO1 | R | 1 |
| 13. | \_\_\_\_\_\_\_\_ is considered as the primary centre of origin of maize. | | | CO3 | A | 1 |
| 14. | *Eleusine coracana* is the botanical name for \_\_\_\_\_\_ | | | CO1 | R | 1 |
| 15. | "Kabuli gram and Desi gram are nothing but our Bengal gram". Is this statement correct or incorrect? | | | CO6 | R | 1 |
| 16. | \_\_\_\_\_\_\_\_ is the botanical name for Bengal gram or Chickpea. | | | CO6 | R | 1 |
| 17. | Indian Institute of Soybean Research is located in \_\_\_\_\_\_\_ | | | CO6 | R | 1 |
| 18. | \_\_\_\_\_\_\_ is the operation which is performed in low land paddy cultivation where ploughing is done in the flooded soil which mixes the soil and water to produce an impervious layer. | | | CO3 | R | 1 |
| 19. | Name the process where the seeds are hydrated and then dried to their original moisture content to overcome the environmental stress in the field. | | | CO6 | U | 1 |
| 20. | \_\_\_\_\_\_\_\_\_\_\_ crop is referred as the "Queen of Cereals". | | | CO1 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | | |
| 21. | Briefly distinguish the characteristics of Indica, Japonica and Javanica sub species of rice. | | | CO1 | R | 5 |
| 22. | What are the advantages in SRI method of paddy cultivation? | | | CO3 | E | 5 |
| 23. | List down the economic importance of rice. | | | CO6 | An | 5 |
| 24. | What is transgenic rice? Explain in detail about different transgenic rice varieties available. | | | CO3 | A | 5 |
| 25. | Elaborate about the management aspects of aged paddy seedlings, if used for transplanting in the main field. | | | CO6 | A | 5 |
| 26. | Elaborate about the nutrient management in cultivating the irrigated maize. | | | CO5 | A | 5 |
| 27. | Elaborate about the application of organic manures and Bio-fertilizers for cultivating transplanted puddled lowland rice. | | | CO3 | R | 5 |
| 28. | Narrate about the constraints and challenges for wheat production in India. | | | CO2 | E | 5 |
| 29. | List down the different types of maize and explain their characteristics? | | | CO1 | R | 5 |
| 30. | Elaborate about the general seed treatment procedures which are followed for pulse crops by .using fungicides, biocontrol agents and biofertilizers. | | | CO4 | U | 5 |
| 31. | Briefly explain about the nutritional values of sorghum. | | | CO1 | R | 5 |
| 32. | Write in detail about the nursery preparation procedures for SRI method of paddy cultivation. | | | CO3 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | | |
| 33. | | a. | Explain in detail about the cultivation practices for Irrigated Maize from sowing to harvest. | CO3 | A | 10 |
|  | | b. | Write briefly about the Nitrate poisoning in maize. | CO2 | A | 5 |
| 34. | | a. | Explain in detail about the cultivation practices for wheat from sowing to harvest. | CO3 | An | 10 |
|  | | b. | Elaborate about sorghum poisoning. | CO6 | An | 5 |
| 35. | | a. | Elaborate about the economic importance of Soybean and briefly describe about the crop's origin, distribution and cultivation practices in India. | CO1 | E | 10 |
|  | | b. | Explain in detail about N management through LCC for paddy. | CO 3 | A | 5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand the geographical distribution, varietal improvements and the adaptability of major cereals and pulses cultivated in India. |
| CO2 | Acquire knowledge on crop production technologies for Rabi cereals. |
| CO3 | Perceive knowledge on crop production technologies for Kharif cereals. |
| CO4 | Manage the crop production technologies for Rabi pulses. |
| CO5 | Work out the crop production technologies for Kharif pulses. |
| CO6 | Apply the acquired knowledge to guide the farmers for cultivating cereals and pulses. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 21 |  | 1 |  | 10 |  | 32 |
| CO2 |  |  | 5 | 1 | 5 |  | 11 |
| CO3 | 6 |  | 26 | 11 | 5 |  | 48 |
| CO4 |  | 5 |  |  |  |  | 5 |
| CO5 | 1 |  | 5 |  |  |  | 6 |
| CO6 | 5 | 1 | 7 | 10 |  |  | 23 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3009** | **Duration** | **3hrs** |
| **Course Name** | **AGRONOMY OF OILSEED, FIBER AND SUGAR CROPS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Name the state which produces maximum mustard. | | CO1 | U | 1 |
| 2. | What is the oil content in linseed? | | CO1 | R | 1 |
| 3. | Name the state which has maximum area under groundnut. | | CO1 | R | 1 |
| 4. | Name the chemical used for seed hardening in groundnut. | | CO2 | R | 1 |
| 5. | How much gypsum should be applied for peanut? | | CO2 | U | 1 |
| 6. | Name the fruit of rapeseed and mustard. | | CO2 | R | 1 |
| 7. | Name the cotton fruit. | | CO3 | U | 1 |
| 8. | Define high density planting in cotton. | | CO3 | R | 1 |
| 9. | What is linen fabric? | | CO3 | U | 1 |
| 10. | What is the optimum water pH for retting? | | CO4 | U | 1 |
| 11. | Who is called father of hybrid cotton? | | CO4 | U | 1 |
| 12. | What is arrowing in sugarcane? | | CO4 | R | 1 |
| 13. | Name the noble cane varieties. | | CO5 | R | 1 |
| 14. | What is sod crop? | | CO5 | R | 1 |
| 15. | What is retting in jute? | | CO6 | U | 1 |
| 16. | Write the uses of sunhemp. | | CO6 | R | 1 |
| 17. | What are the hybrids of sugarbeet suitable for cultivation in tamil nadu? | | CO6 | U | 1 |
| 18. | Enumerate the good qualities of sugarcane. | | CO1 | R | 1 |
| 19. | What is ratooning in sugarcane? | | CO2 | U | 1 |
| 20. | What is detrashing in sugarcane? | | CO4 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Tabulate the differences between sympodia and Non sympodial branches in cotton. | | CO1 | An | 5 |
| 22. | List out important steps in sugarcane ratoon management. | | CO2 | U | 5 |
| 23. | Mention the problems in sunflower cultivation in India. | | CO3 | An | 5 |
| 24. | Why is color cotton not popular in India? | | CO4 | U | 5 |
| 25. | Write the important castor hybrids and its importants. | | CO5 | An | 5 |
| 26. | Write the differences between the sugarcane and sugarbeet. | | CO6 | U | 5 |
| 27. | Write the different methods of sugarcane planting. | | CO1 | An | 5 |
| 28. | What is crop logging ? How it is useful in enhancing the sugarcane yield ? | | CO2 | U | 5 |
| 29. | Write the importance of white seeded sesamum ? | | CO3 | An | 5 |
| 30. | Write different varieties of sugarbeet ? | | CO4 | U | 5 |
| 31. | Calculate the quantity of oil,and income with the data Pod yield 2500kg,shelling per cent 60 and cost of oil Rs.250/kg . | | CO5 | An | 5 |
| 32. | What is aflatoxin and its management measures.? | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | How to increase oil seed production in India? | CO1 | U | 7.5 |
|  | b. | How can we enhance the ratoon sugarcane yield ? | CO3 | U | 7.5 |
| 34. | a. | Give in details about methods of sugarcane planting. | CO2 | U | 7.5 |
|  | b. | List out the different by products of sugarcane. | CO3 | U | 7.5 |
| 35. | a. | Bt cotton is a boom for farmers.Explain with scientific reasons. | CO3 | U | 7.5 |
|  | b. | Enumerate the importance of sesame. | CO2 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL



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| **Course Code** | **21AG3010** | **Duration** | **3hrs** |
| **Course Name** | **AGRONOMY OF FODDER AND FORAGE CROPS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | **CO/BL** | | **Marks** |
| **PART – A (20X1 = 20 MARKS)**  **(Answer all the questions)** | | | | |
| 1. | The ideal time of sowing fodder sorghum is \_\_\_\_\_\_\_\_\_. | | CO 1R | 1 |
| 2. | The oldest fodder crop is \_\_\_\_\_\_\_\_\_. | | CO 1 / R | 1 |
| 3. | Lucerne will give a seed yield of \_\_\_\_\_\_\_\_\_ kg. | | CO1 / U | 1 |
| 4. | Among the cereal grains \_\_\_\_\_\_ constitute 75 percent poultry feed in India. | | CO 2/ U | 1 |
| 5. | Tamil Nadu has\_\_\_\_\_\_\_\_\_ under fodder crops cultivation. | | CO 2 / A | 1 |
| 6. | Write the name of anti nutrient quality present in Cotton seed. | | CO 2 / E | 1 |
| 7. | The common forage crop suitablefor rain fed condition is \_\_\_\_\_\_\_\_\_. | | CO 1 / C | 1 |
| 8. | Which factor is responsible for reducing the productivity of pasture? | | CO 3 / A | 1 |
| 9. | Give two grasses suitable for problem soils. | | CO 3/ C | 1 |
| 10. | Fodder cowpea requires \_\_\_\_\_\_\_\_\_ mm of water. | | CO 3 / E | 1 |
| 11. | Define fodder. | | CO 2/ A | 1 |
| 12. | Define forage. | | CO 2 / E | 1 |
| 13. | \_\_\_\_\_\_\_\_\_ is a poison present in sorghum. | | CO 2 / E | 1 |
| 14. | \_\_\_\_\_\_\_\_\_ is called as theQueen offodder. | | CO 2/ A | 1 |
| 15. | Cultivation of fodder crops without soil is called as \_\_\_\_\_\_\_\_\_. | | CO 2/ E | 1 |
| 16. | Hydroponic fodder can be harvested in \_\_\_\_\_\_\_\_\_ days after sowing. | | CO 2/ E | 1 |
| 17. | Name a preservative to be added in silage preparation. | | CO 3 / C | 1 |
| 18. | Write the seed rate for fodder fodder sorghum. | | CO 3 / E | 1 |
| 19. | Name a variety suitable for multi cut fodder in sorghum. | | CO 3 / R | 1 |
| 20. | Which crop is called as the King of fodder? | | CO 3 / E | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Discuss the differentfodder production system in India. | CO1 /R | 5 |
| 22. | List out the package of practices of cumbunapier hybrid cultivation. | CO 2 / U | 5 |
| 23. | Write the special features of a forage crop. | CO 2/ U | 5 |
| 24. | Write the economic importance of berseem. | CO 2 / A | 5 |
| 25. | List out the constraints in fodder cropscultivation and discuss the strategy to increase fodder production in India. | CO 1 / E | 5 |
| 26. | Explain the package of practices for fodder pearl millet cultivation. | CO2 /A | 5 |
| 27. | What is year around fodder production with a model? | CO 1 / C | 5 |
| 28. | Give a detailed account for good silage preparation. | CO 2 /A | 5 |
| 29. | Write the importance of Tree fodder in India. | CO1 / C | 5 |
| 30. | What is the poor quality fodder and its enrichment methods? . | CO 1 / U | 5 |
| 31. | Define a fodder bank. | CO 3 / C | 5 |
| 32. | Write the seed production technique for fodder sorghum. | CO 3 /R | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. | a. | Discuss in detail Hydroponic fodder production System. | CO1 / R | 8 |
| b. | Write the different anti nutrient qualities in fodder crops. | CO 2 /U | 7 |
| 34. | a. | Write the package of practices of Lucerne fodder cultivation. | CO 3/ A | 8 |
| b. | Mention the important forage crops grown in India? Discuss the agro techniques of cumbunapier grass. | CO4 / A | 7 |
| 35. | a. | Discuss the role of coarse grains in animal feeds. | CO 5 / E | 8 |
| b. | List out the principles and practices of cultivation of irrigated fodder crops. | CO 6 / C | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Know about the adaptation, distribution, varietal improvements and quality characteristics of fodder crops. |
| CO2 | Know the significance of forage crops. |
| CO3 | Acquire knowledge on crop production technologies for different fodder crops and forage crops. |
| CO4 | Perceive the methods of preserving the fodder crop. |
| CO5 | Understand the methods of processing and enrichment of fodder crops. |
| CO6 | Recommend different forage crops in reference to nutritive values and animal health. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 14 | 6 | - | - | 5 | 11 | 36 |
| CO2 | - | 19 | 18 | - | 5 | - | 42 |
| CO3 | 6 | - | 8 | - | 3 | 7 | 24 |
| CO4 | - | - | 8 | - | - | - | 8 |
| CO5 | - | - | - | - | 7 | - | 7 |
| CO6 | - | - | - | - | - | 8 | 8 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3033** | **Duration** | **3hrs** |
| **Course Name** | **BIOTECHNOLOGY FOR CROP IMPROVEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Virus-free plants are produced by --------------------- culture. | | CO1 | R | 1 |
| 2. | What is totipotency? | | CO1 | U | 1 |
| 3. | Difference between dihaploid and doubled haploid. | | CO1 | A | 1 |
| 4. | Expand PCR and who invented it? | | CO2 | U | 1 |
| 5. | The method used for haploid production is ------------------------. | | CO1 | U | 1 |
| 6. | What is Bulked Segregant Analysis? | | CO4 | R | 1 |
| 7. | Recent molecular markers used for mapping is ------------- and --------------. | | CO4 | R | 1 |
| 8. | Who is considered as Father of Biotechnology? | | CO1 | R | 1 |
| 9. | GEAC stands for --------------------------------------------------- | | CO6 | R | 1 |
| 10. | NAA and 2,4-D are the type of cytokinin in plant growth regulator (True/False) | | CO1 | A | 1 |
| 11. | Define Somaclone. | | CO1 | U | 1 |
| 12. | Who proposed anther culture? | | CO1 | R | 1 |
| 13. | Define redifferentiation. | | CO1 | U | 1 |
| 14. | The male sterility gene barnase is isolated from the bacteria-------------------. | | CO5 | R | 1 |
| 15. | NABI stands for ----------------- and located at -----------------. | | CO5 | R | 1 |
| 16. | Define Gene pyramiding. | | CO4 | A | 1 |
| 17. | The role of CTAB in DNA extraction is -----------------------. | | CO2 | U | 1 |
| 18. | The shelf life of tomato was increased by silencing polygalactronase gene with -------------- technology. | | CO5 | U | 1 |
| 19. | Define Genome editing. | | CO5 | A | 1 |
| 20. | What is cryopreservation? | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What is marker-assisted selection? Explain the advantages over conventional breeding approaches. | | CO4 | U | 5 |
| 22. | Define molecular markers and briefly explain the types of molecular markers | | CO4 | R | 5 |
| 23. | What is polymerase chain reaction? Explain the steps in it. | | CO4 | A | 5 |
| 24. | What is genetic engineering male sterility and explain about Barnase/Barstar system? | | CO5 | U | 5 |
| 25. | Explain the role and function of chemicals used in DNA extraction. | | CO2 | U | 5 |
| 26. | Briefly explain the sterilization techniques and their types. | | CO1 | U | 5 |
| 27. | What is somatic embryogenesis and mention about its classification? | | CO1 | A | 5 |
| 28. | Explain the types of explants used for plant tissue culture. | | CO1 | U | 5 |
| 29. | Explain the achievements of genetic engineering in crop Improvement. | | CO5 | A | 5 |
| 30. | What is the role of biotechnology in crop improvement? | | CO1 | A | 5 |
| 31. | Explain gene cloning. | | CO5 | A | 5 |
| 32. | What are doubled haploids and how can be produced? | | CO4 | A | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | What is recombinant DNA technology and mention about the classification of vectors used? | CO3 | A | 8 |
|  | b. | Explain the steps involved in Bulked Segregant Analysis for mapping major traits. | CO4 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | What is mapping population? Briefly explain the types of mapping population. | CO4 | U | 8 |
|  | b. | Write about the different components of a Media and describe the various kinds of media used in tissue culture techniques. | CO1 | A | 7 |
|  |  |  |  |  |  |
| 35. | a. | Explain agrobacterium-mediated genetic transformation with a neat diagram. | CO5 | U | 8 |
|  | b. | Briefly write about GISH and FISH. | CO5 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Do micropropagation in crop plants. |
| CO2 | Understand the quantification and quality assessment of plant genomic DNA. |
| CO3 | Practice vector-based cloning procedures. |
| CO4 | Apply their knowledge on mapping and tagging of agronomically important traits. |
| CO5 | Transfer foreign genes into plants through rapid introgression methods. |
| CO6 | Gain knowledge on legal and ethical views about GMOs. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 14 | 19 | - | - | - | 36 |
| CO2 | - | 7 | - | - | - | - | 7 |
| CO3 | - | - | 8 | - | - | - | 8 |
| CO4 | 7 | 20 | 11 | - | - | - | 38 |
| CO5 | 2 | 15 | 18 | - | - | - | 35 |
| CO6 | 1 | - | - | - | - | - | 1 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3214** | **Duration** | **3hrs** |
| **Course Name** | **PLANT BIOCHEMISTRY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Give an example of secondary metabolite. | | CO5 | R | 1 |
| 2. | ……… is the father of Biochemistry. | | CO1 | R | 1 |
| 3. | ……………… is the ripening hormone. | | CO3 | R | 1 |
| 4. | List one plant defense molecules. | | CO6 | R | 1 |
| 5. | The vascular bundle is surrounded by…………. in C4 plants. | | CO1 | R | 1 |
| 6. | …………………. Gene involved in glycine betaine synthesis is used for genetic transformation in crops. | | CO4 | R | 1 |
| 7. | The key enzyme in sucrose biosysnthesis regulation is ………………. | | CO2 | R | 1 |
| 8. | **……………** is the site of Calvin cycle. | | CO1 | R | 1 |
| 9. | The unit membrane of vacuole is called as………………… | | CO1 | R | 1 |
| 10. | GA helps in the synthesis of ………………. Enzyme. | | CO3 | R | 1 |
| 11. | ………………. is a free-living nitrogen fixer. | | CO3 | R | 1 |
| 12. | ……………. hormone is responsible for stomatal closure. | | CO4 | R | 1 |
| 13. | Name an inhibitor of ABA. | | CO3 | R | 1 |
| 14. | The synthesis of starch from sources other than carbohydrates is called………… | | CO2 | R | 1 |
| 15. | The accessory pigment that scavenges free radicles is ……………… | | CO4 | R | 1 |
| 16. | The first acceptor of carbon di oxide in C4 plant is…………………. | | CO1 | R | 1 |
| 17. | ………………… is the main enzyme in C3 photosynthesis | | CO1 | R | 1 |
| 18. | The process of transfer of signal from receptor to nucleus is called as……… | | CO4 | R | 1 |
| 19. | The sequence present above the start site is called ……………. acting elements | | CO4 | R | 1 |
| 20. | The stress caused by living organism is called as ………………… | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Classify alkaloids and give one example for each. | | CO6 | U | 5 |
| 22. | Explain the structure and function of mitochondria with a neat diagram. | | CO1 | U | 5 |
| 23. | Write short note on osmoprotectants. | | CO4 | R | 5 |
| 24. | Discuss the significance of secondary metabolites. | | CO5 | U | 5 |
| 25. | Explain biological nitrogen fixation. | | CO3 | U | 5 |
| 26. | What are the four structures of proteins? | | CO4 | R | 5 |
| 27. | Discuss the three steps in Calvin cycle. | | CO1 | R | 5 |
| 28. | Classify antioxidants based on type. | | CO4 | U | 5 |
| 29. | What are the major stresses and its effects on crops? | | CO4 | R | 5 |
| 30. | List out the exogenous source of free radicals with an example. | | CO5 | R | 5 |
| 31. | Describe the biosynthesis the starch. | | CO2 | U | 5 |
| 32. | Explain the glycine betaine biosynthetic pathway. | | CO4 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain the different auxin biosynthetic pathways. | CO3 | U | 8 |
|  | b. | Discuss the physiological role of Gibberellic acid. | CO3 | U | 7 |
|  |  |  |  |  |  |
| 34. | a. | Describe the C4 photosynthetic pathway. | CO1 | U | 8 |
|  | b. | Differentiate C3 and C4 plants. | CO1 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | Discuss the importance of plant biochemistry in agriculture. | CO1 | U | 7 |
|  | b. | Explain the different drought adaptation mechanism in plants. | CO4 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the biochemistry of plant photosynthesis. |
| CO2 | Remember the biosynthesis of plant biomolecules. |
| CO3 | Understand the biochemistry of plant developmental processes. |
| CO4 | Explain the biochemistry of stress mechanisms in plant system. |
| CO5 | Describe the synthesis of secondary metabolites in plant system. |
| CO6 | Discuss defense mechanisms in plant system. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 11 | 27 | - | - | - | - | 38 |
| CO2 | 2 | 5 | - | - | - | - | 7 |
| CO3 | 4 | 20 | - | - | - | - | 24 |
| CO4 | 21 | 18 | - | - | - | - | 39 |
| CO5 | 6 | 5 | - | - | - | - | 11 |
| CO6 | 1 | 5 | - | - | - | - | 6 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3219** | **Duration:** | **3hrs** |
| **Course Name** | **DATA ANALYSIS USING STATISTICAL PACKAGES** | **Max. Marks:** | **100** |

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|  | **Questions** | **CO / P** | **Marks** |
| **PART – A (20X1 = 20 MARKS)** | | | |
| 1. | What is statistics? | CO1/R | 1 |
| 2. | Write the difference between simple bar diagram and multiple bar diagram. | CO1/R | 1 |
| 3. | Which is the positional average? | CO1/U | 1 |
| 4. | What is the range of probability? | CO2/R | 1 |
| 5. | Write down the measures used to find dispersion in the data? | CO2/R | 1 |
| 6. | Algebraic sum of deviation of a set of values from their arithmetic mean is \_\_\_\_\_\_\_ | CO2/U | 1 |
| 7. | Which test is used to test the mean of more than two samples? | CO3/R | 1 |
| 8. | What is level of significance? | CO6/R | 1 |
| 9. | Excel formulae for logarithmic transformation is \_\_\_\_\_\_\_\_ | CO3/A | 1 |
| 10. | What is the minimum error *df* of an experiment? | CO3/U | 1 |
| 11. | What is null hypothesis? | CO4/R | 1 |
| 12. | Write down the reason to apply data transformation. | CO4/U | 1 |
| 13. | What is the objective of Principle component analysis? | CO6/R | 1 |
| 14. | Expand ANOVA. | CO3/ R | 1 |
| 15. | Write down the simple linear regression model. | CO3/ R | 1 |
| 16. | The measure of peakedness or flatness of the frequency curves are called \_\_\_\_\_\_\_\_\_ | CO2/U | 1 |
| 17. | Which measure is used for calculation average price of certain product in the market? | CO1/U | 1 |
| 18. | If any one of the observations is Zero, then geometric mean is \_\_\_\_\_\_\_\_\_\_ | CO2/U | 1 |
| 19. | When you adopt CRD in agricultural experiments? | CO3/U | 1 |
| 20. | Write the formulae for calculation of CD. | CO3/R | 1 |

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| **PART – B (10 X 5 = 50 MARKS)(Answer any 10 from the following)** | | | |
| 21. | List down the procedure for DMRT. | CO6/R | 5 |
| 22. | Explain the concept of uniformity trial. | CO1/U | 5 |
| 23. | Define correlation. Write the assumption and properties of correlation analysis. | CO3/R | 5 |
| 24. | Write the testing procedure for testing more than two means. | CO3/U | 5 |
| 25. | List out assumptions of F-test. | CO3/R | 5 |
| 26. | Write a note on t test. | CO3/U | 5 |
| 27. | What are all the ideal measures for dispersion? Which one is the ideal measure according to you? Give reason | CO1/U | 5 |
| 28. | What are all the basic properties of regression? Explain the regression coefficient formulae | CO3/U | 5 |
| 29. | Draw the O-give curve for the following distribution showing the number of marks of 59 students in statistics. Locate graphically the value of Median, Q2, D5, P50   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | | No of students | 4 | 8 | 11 | 15 | 12 | 6 | 3 | | CO1/C | 5 |
| 30. | Write down the ANOVA table and explain it. | CO3 /U | 5 |
| 31. | Write the difference between correlation and regression. | CO2/U | 5 |
| 32. | What is type I and type II error? | CO5/ R | 5 |

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| **PART – C (2 X 15 = 30 MARKS)(Answer any 2 from the following)** | | | | | | |
| 33. |  | |  |
|  | Calculate the mean deviation and standard deviation for the following table giving the age distribution of 542 members.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Age (in years) | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | | No of members | 3 | 61 | 132 | 153 | 140 | 51 | 2 | | | | CO1/E | 15 |
|  |  | | |  |  |
| 34. |  | An experiment in CRD with 8 treatments replicated 3 times. Give ANOVA table   |  |  |  |  | | --- | --- | --- | --- | | Treatment | Replication | | | | R1 | R2 | R3 | | T1 | 12 | 14 | 16 | | T2 | 13 | 18 | 16 | | T3 | 12 | 14 | 17 | | T4 | 10 | 12 | 14 | | T5 | 15 | 13 | 13 | | T6 | 12 | 14 | 15 | | T7 | 11 | 10 | 12 | | T8 | 18 | 16 | 19 | | | | CO3/An | 15 |
|  | Interpret the results. | | |  |  |
|  |  | | |  |  |
| 35. | a. | An analysis of monthly wages paid to the worker of two firms A and B belonging to the same industry gives the following results:   1. Which firm, A or B has a large wage bill? 2. In which firm, A or B is there greater variability in individual wages?  |  |  |  | | --- | --- | --- | | Firms | Firm A | Firm B | | Number of workers | 500 | 600 | | Average monthly wage | Rs. 186.00 | Rs. 175.00 | | Variance of distribution of wages | 81 | 100 | | | | CO4/A | 7 |
| b. | Draw a histogram for the following data.   |  |  | | --- | --- | | Seed yield (g) | No of plants | | 2.5-3.5 | 04 | | 3.5-4.5 | 06 | | 4.5-5.5 | 10 | | 5.5-6.5 | 26 | | 6.5-7.5 | 24 | | 7.5-8.5 | 15 | | 8.5-9.5 | 10 | | 9.5-10.5 | 05 | | | | CO5/C | 8 |
|  |  | | |  |  |

**Course outcomes:**

1. Understand the procedure for analyzing through statistical packages.

2. Interpretation of results obtained from analysis.

3. Learn new and advanced softwares for biological data analysis.

4. Establish start-ups for data analysis.

5. Analyze time series data.

6.Interpretation of the results of AMMI and Multivariate analysis

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO/P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 02 | 12 | - | - | 15 | 05 | 34 |
| CO2 | 02 | 08 | - | - | - | - | 10 |
| CO3 | 14 | 22 | 01 | 15 | - | - | 52 |
| CO4 | 01 | 01 | 07 | - | - | - | 09 |
| CO5 | 05 | - | - | - | - | 08 | 13 |
| CO6 | 07 | - | - | - | - | - | 07 |
|  |  |  |  |  |  |  | 125 |



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| **Course Code** | **21AG3226** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Who is the father of Agronomy? | | CO1 | R | 1 |
| 2. | \_\_\_\_\_\_\_\_\_\_ is the process of writing an article or manuscript under someone else's name. | | CO1 | U | 1 |
| 3. | Ethikos is the Greek word from which the word \_\_\_\_\_\_\_\_ was derived. | | CO6 | An | 1 |
| 4. | Describe law of minimum. | | CO1 | U | 1 |
| 5. | Write full name of any one ICAR institution along with its location. | | CO2 | R | 1 |
| 6. | What is the full form of AICRP? | | CO1 | R | 1 |
| 7. | Name the Greek philosopher who mentioned that green manuring will enrich the soil\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | U | 1 |
| 8. | Who is a whistle-blower? | | CO2 | R | 1 |
| 9. | Name any one AICRP center. | | CO2 | R | 1 |
| 10. | What are Magos from Carthage? | | CO1 | U | 1 |
| 11. | In the context of modern-day research, complete the following line: Publish or \_\_\_\_\_\_. | | CO1 | R | 1 |
| 12. | Write the full form of NARS. | | CO2 | R | 1 |
| 13. | What is meant by fabrication in research? | | CO6 | U | 1 |
| 14. | What is humus theory? | | CO4 | E | 1 |
| 15. | What is the main objective of MGNREGA? | | CO4 | R | 1 |
| 16. | Name the three levels of Panchayati Raj. | | CO1 | U | 1 |
| 17. | SGSY stands for \_\_\_\_\_\_\_\_\_\_\_. | | CO2 | R | 1 |
| 18. | What do you mean by plagiarism? | | CO1 | A | 1 |
| 19. | What is meant by scientific misconduct? | | CO5 | R | 1 |
| 20. | Name the book written by JethroTull. | | CO1 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | What are the different forms of scientific misconduct? | | CO1 | E | 5 |
| 22. | List any five national institutes related to agriculture. | | CO2 | R | 5 |
| 23. | Mention five production systems under NATP. (Ex: Agri-hortiproduction system). | | CO4 | C | 5 |
| 24. | Define and describe rural development. | | CO3 | An | 5 |
| 25. | Describe the origin of the CGIAR system. What are the priorities of CGIAR research? | | CO3 | A | 5 |
| 26. | Write a short note on Community Development Programme. | | CO3 | U | 5 |
| 27. | Describe the practical principles of ethical behavior in scientific research. | | CO6 | E | 5 |
| 28. | Expand DPAP. Write a short note about DPAP. | | CO4 | U | 5 |
| 29. | Write a short note on MGNREGA. | | CO5 | R | 5 |
| 30. | Name any five ancient Indian literature which mentioned agriculture. | | CO1 | R | 5 |
| 31. | Write about the early history of Indian agriculture. What are the mandates of ICAR? | | CO3 | An | 5 |
| 32. | List any five international agricultural organizations. | | CO3 | E | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain any three rural development programs of India in detailed from the following.  IADP, SGRY, SGSY, CDP, Panchayati Raj. | CO1 | An | 10 |
|  | b. | Describe the origin of the CGIAR system. What are the priorities of CGIAR research? | CO1 | C | 5 |
| 34. | a. | Describe the rural development policies and strategies after independence. | CO2 | E | 10 |
|  | b. | Write a detailed note on MGNREGA. | CO2 | C | 5 |
| 35. | a. | What is decentralization of powers and explain the role of Panchayat Raj in rural development. | CO2 | C | 5 |
|  | b. | Describe the rural development policies and strategies after independence. | CO4 | An | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Understand the research ethics. | | | | | | | |
| CO2 | Remember the National and International agencies involved in Agricultural Research. | | | | | | | |
| CO3 | Analyse the various Rural Development Programs. | | | | | | | |
| CO4 | Apply their knowledge on understanding the policies of Government. | | | | | | | |
| CO5 | Transfer their knowledge at international level. | | | | | | | |
| CO6 | Attract International collaborations for doing Research. | | | | | | | |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 8 | 4 | 2 | 8 | 5 | 7 | 34 |
| CO2 | | 10 | - | - | - | 8 | 5 | 23 |
| CO3 | | - | 5 | 5 | 5 | 5 | - | 20 |
| CO4 | | 1 | 5 | - | 10 | 1 | 5 | 22 |
| CO5 | | 6 | - | - | 5 | - | - | 11 |
| CO6 | | - | 1 | - | 1 | 13 | - | 15 |
|  | | | | | | | | **125** |



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| **Course Code** | **21HO1251** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF HORTICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | India stands\_\_\_\_\_\_\_\_\_\_ in production vegetables in the world. | | CO1 | R | 1 |
| 2. | Mention the vitamin present in mango. | | CO1 | R | 1 |
| 3. | Write the meaning of pomology. | | CO1 | R | 1 |
| 4. | Define layering. | | CO1 | R | 1 |
| 5. | Write any two common diseases of plants at nursery stage. | | CO3 | R | 1 |
| 6. | Mention two examples for air layering. | | CO3 | An | 1 |
| 7. | Define graft incompatibility. | | CO3 | R | 1 |
| 8. | Give two examples for perennial vegetables. | | CO3 | R | 1 |
| 9. | Write two examples for cut flowers. | | CO1 | R | 1 |
| 10. | Define mixed cropping. | | CO4 | R | 1 |
| 11. | Expand IIVR and IIHR. | | CO1 | R | 1 |
| 12. | Name the national pickle of India. | | CO4 | R | 1 |
| 13. | Define budding. | | CO3 | An | 1 |
| 14. | Write the mode of propagation of asexually propagated crop. | | CO3 | R | 1 |
| 15. | Name two internal factors affecting growth and development of plant. | | CO1 | R | 1 |
| 16. | What are long day crops? | | CO4 | R | 1 |
| 17. | Define fertigation. | | CO5 | An | 1 |
| 18. | What is polyembryony? | | CO5 | R | 1 |
| 19. | Name any two leafy vegetables. | | CO1 | R | 1 |
| 20. | Define multitier cropping. | | CO4 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the internal factors which influence growth and development of plants. | | CO5 | An | 5 |
| 22. | What is asexual propagation? Also, explain cutting type of propagation method. | | CO3 | U | 5 |
| 23. | Mention the advantages and disadvantages nursery management. | | CO5 | R | 5 |
| 24. | Explain air layering and its types. | | CO3 | An | 5 |
| 25. | Write the difference between sexual and asexual mode of propagation in plants. | | CO3 | R | 5 |
| 26. | Explain contour planting system and its advantages. | | CO4 | R | 5 |
| 27. | Define clean culture, mulching, sod and sod mulch. | | CO4 | U | 5 |
| 28. | Discuss the methods of fertilizer application. | | CO5 | R | 5 |
| 29. | Difference between intercropping and mixed cropping. | | CO4 | U | 5 |
| 30. | Mention the different branches of horticulture. | | CO1 | R | 5 |
| 31. | Discuss square system of planting method. | | CO4 | R | 5 |
| 32. | Explain irrigation and types of irrigation methods fallowed in orchard. | | CO4 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain grafting, and its types with suitable example. | CO3 | R | 7.5 |
|  | b. | List out the tropical, sub tropical and temperate fruit crops. | CO3 | An | 7.5 |
| 34. | a. | Enumerate the causes of graft incompatibility. | CO3 | R | 7.5 |
|  | b. | Write the classification of vegetables. | CO2 | R | 7.5 |
| 35. | a. | Write a detailed note on pruning in orchard, its types and advantages. | CO4 | U | 7.5 |
|  | b. | Discuss the scope and importance of horticultural crops. | CO1 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Definitions, importance-scope of horticultural crops, branches, methods and techniques. |
| CO2 | Agro climatic zones of India. |
| CO3 | Different methods of plant propagation. |
| CO4 | Different types of planting systems and irrigation, training and pruning. |
| CO5 | Apply principles of orchard management and nursery. |

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| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20.5 | - | - | 14.5 | - | - | 35 |
| CO2 | 7.5 | - | - | - | - | - | 7.5 |
| CO3 | 24 | 5 | - | - | - | - | 29 |
| CO4 | 19 | 17.5 | - | - | - | - | 36.5 |
| CO5 | 11 | - | - | 6 | - | - | 17 |
| CO6 |  |  |  |  |  |  |  |
|  | | | | | | | **125** |



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| **Course Code** | **21HO1251** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF HORTICULTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define plant growth regulators. | | CO1 | R | 1 |
| 2. | Define polyembryony with examples. | | CO2 | R | 1 |
| 3. | Differentiate Deciduous and Evergreen crops with examples. | | CO3 | U | 1 |
| 4. | Define Fruitfulness. | | CO2 | R | 1 |
| 5. | What is coir compost? | | CO5 | U | 1 |
| 6. | Define Rhizome. | | CO2 | R | 1 |
| 7. | What is soil fertility? | | CO5 | U | 1 |
| 8. | What is ethylene? | | CO2 | U | 1 |
| 9. | List out any two National level Institutions in Horticulture. | | CO1 | A | 1 |
| 10. | List out any five special practices followed in Horticulture crops. | | CO5 | A | 1 |
| 11. | Define Horticulture. | | CO1 | R | 1 |
| 12. | Define Micropropagation. | | CO3 | R | 1 |
| 13. | Define Fertigation. | | CO4 | R | 1 |
| 14. | What is Rootstock? | | CO3 | R | 1 |
| 15. | List out any two reasons for fruit drop. | | CO4 | U | 1 |
| 16. | Differentiate spices and condiments. | | CO1 | A | 1 |
| 17. | Define topworking. | | CO5 | U | 1 |
| 18. | What is kitchen Garden? | | CO1 | U | 1 |
| 19. | Explain on Horticulture therapy. | | CO1 | U | 1 |
| 20. | What is chip budding? | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain about Air layering with diagrams. | | CO4 | A | 5 |
| 22. | Define cuttings and list out the various cutting methods with examples. | | CO4 | U | 5 |
| 23. | Write about the divisions of Horticulture. | | CO1 | U | 5 |
| 24. | What are the merits and demerits of Sexual propagation? | | CO4 | R | 5 |
| 25. | Explain on the Nutritive value of Horticulture crops. | | CO2 | R | 5 |
| 26. | Explain different types of Apomixis. | | CO3 | U | 5 |
| 27. | Discuss briefly on the irrigation system in horticulture. | | CO4 | A | 5 |
| 28. | Discuss in detail the bearing habits of Horticulture crops. | | CO4 | U | 5 |
| 29. | Explain the causes of unfruitfulness in Horticulture crops. | | CO3 | U | 5 |
| 30. | Explain on Agro climatic zones of Tamilnadu. | | CO2 | R | 5 |
| 31. | Discuss on the use of plant growth regulators in Horticulture crops. | | CO4 | A | 5 |
| 32. | Explain on different cropping system in Horticulture. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write about scope and importance of horticulture crops. | CO1 | R | 7.5 |
|  | b. | Discuss in detail the different planting systems in Horticulture crops. | CO5 | A | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Write about stock scion relationship in grafting. | CO4 | U | 7.5 |
|  | b. | Explain the different methods of grafting with diagrams. | CO4 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain in detail the different training methods in Horticulture crops. | CO6 | A | 7.5 |
|  | b. | Explain in detail the principles of organic farming and list out the various organic manures used in horticulture crops. | CO6 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Explain the significance and scope of horticultural crops |
| CO2 | Identify and describe the growth and development of various horticultural crops |
| CO3 | Discuss the production of horticultural crops in the country and related imports and exports |
| CO4 | Demonstrate the production techniques of horticultural crops |
| CO5 | Plan the establishment of Orchard and its management |
| CO6 | Practice Special horticultural operations and organic farming in these crops |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 9.5 | 7 | 2 |  |  |  | 18.5 |
| CO2 | 13 | 1 |  |  |  |  | 14 |
| CO3 | 3 | 16 |  |  |  |  | 19 |
| CO4 | 6 | 18.5 | 22.5 |  |  |  | 47 |
| CO5 |  | 3 | 8.5 |  |  |  | 11.5 |
| CO6 |  | 7.5 | 7.5 |  |  |  | 15 |
|  | | | | | | | **125** |



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| **Course Code** | **21HO1270** | **Duration** | **3hrs** |
| **Course Name** | **PRODUCTION TECHNOLOGY FOR FRUIT AND PLANTATION CROPS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Mention any two important TNAU varieties of sapota crop. | | CO2 | R | 1 |
| 2. | Define Pomology. | | CO2 | R | 1 |
| 3. | Mention the scientific name of Mango………….. | | CO3 | R | 1 |
| 4. | Guava belongs to ………….. Family. | | CO3 | R | 1 |
| 5. | Transmission of Papaya Ring Spot virus is due to ………….. | | CO3 | U | 1 |
| 6. | Mention any two richest source of vitamin ‘A’ fruit ……….. & ………….. | | CO5 | A | 1 |
| 7. | Mention the two Polyembryony varieties of mango……….. | | CO5 | A | 1 |
| 8. | Origin of Jackfruit …………. | | CO2 | R | 1 |
| 9. | National fruit of india is also called as ………….. | | CO3 | R | 1 |
| 10. | Telephone system followed in …………. fruit crop. | | CO4 | An | 1 |
| 11. | Lucknow – 49 is a variety of ………… fruit crop. | | CO2 | R | 1 |
| 12. | Expand the UHDP………….. | | CO5 | R | 1 |
| 13. | Mention the scientific name of Tea…………. | | CO3 | R | 1 |
| 14. | Mention ant two varieties of coffee ……….. | | CO3 | R | 1 |
| 15. | Expand the given abbreviated words – TNAU & IIHR. | | CO2 | U | 1 |
| 16. | Commercially followed in Whip and Tongue grafting ……….. fruit crop. | | CO4 | A | 1 |
| 17. | Mangala is a variety of ………… plantation crop. | | CO1 | An | 1 |
| 18. | State tree of Tamil Nadu is called as ……….. plantation crops. | | CO3 | An | 1 |
| 19. | Mention any two important varieties of Coconut …………… | | CO3 | An | 1 |
| 20. | Expand the CTC method of tea ………… | | CO3 | An | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write in detail about physiological disorder of Mango. | | CO6 | U | 5 |
| 22. | Explain the six important varieties and Specific features of Papaya. | | CO3 | U | 5 |
| 23. | Elaborate the Inarching or Approaching grafting method of Mango. | | CO2 | U | 5 |
| 24. | Write important rootstocks of Apple with features. | | CO2 | U | 5 |
| 25. | Describe the tapping method in rubber. | | CO3 | U | 5 |
| 26. | Explain the propagation method of cashew nut. | | CO3 | U | 5 |
| 27. | Explain the important varieties of Arecanut. | | CO3 | U | 5 |
| 28. | Write a processing method of tea. | | CO3 | U | 5 |
| 29. | Discuss the importance and scope of fruit and plantation crop industry in India. | | CO3 | An | 5 |
| 30. | Explain the propagation method of apple and litchi. | | CO1 | U | 5 |
| 31. | Discuss the physiological disorders in Grapes. | | CO6 | U | 5 |
| 32. | Explain the important rootstocks of Citrus. | | CO3 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the production technology of Mango. | CO3 | U | 15 |
|  | b. | Explain the production technology of Sapota. | CO3 | U |
|  |  |  |  |  |  |
| 34. | a. | Enumerate the production technology of Apple. | CO3 | U | 15 |
|  | b. | Elaborate the physiological disorders coconut. | CO2 | U |
|  |  |  |  |  |  |
| 35. | a. | Discuss the production technology of Coffee. | CO3 | U | 15 |
|  | b. | Explain the production technology of Cocoa. | CO5 | U |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the scope and importance of fruit and plantation crop production |
| CO2 | Apply propagation methods in fruit and plantation crops |
| CO3 | Apply production technologies in fruit and plantation crops |
| CO4 | Manage pests of fruit and plantation crops |
| CO5 | Control diseases of fruits and plantation crops |
| CO6 | Handle physiological disorders of fruit and plantation crops |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 5 | - | 1 | - | - | 6 |
| CO2 | 4 | 18.5 | - | - | - | - | 22.5 |
| CO3 | 5 | 61 | - | 8 | - | - | 74 |
| CO4 | - | - | 1 | 1 | - | - | 2 |
| CO5 | 1 | 7.5 | 2 | - | - | - | 10.5 |
| CO6 | - | 10 | - | - | - | - | 10 |
|  | | | | | | | **125** |



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| **Course Code** | **21HO2271** | **Duration** | **3hrs** |
| **Course Name** | **PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define olericulture. | | CO2 | R | 1 |
| 2. | Metaxenia is observed in which vegetable crops. | | CO2 | R | 1 |
| 3. | Write the seed rate of hybrid tomato for one hectare. | | CO2 | A | 1 |
| 4. | Define cole crops. | | CO2 | R | 1 |
| 5. | Name one seedless variety of watermelon. | | CO2 | R | 1 |
| 6. | Onion bulb is modified by ------------. | | CO1 | U | 1 |
| 7. | Pungency in radish is due to-----------. | | CO1 | R | 1 |
| 8. | Pillow is important disorder observed in which crop. | | CO3 | R | 1 |
| 9. | Write the mode of pollination in crucifers. | | CO2 | U | 1 |
| 10. | Write the common name of any two perennial vegetables. | | CO1 | R | 1 |
| 11. | Which type of pollination observed in peas and beans? | | CO2 | U | 1 |
| 12. | Biofortification is commonly observed in which vegetables? | | CO2 | R | 1 |
| 13. | Mention the family of ginger and turmeric. | | CO2 | R | 1 |
| 14. | Mention any two research institute working on spices. | | CO2 | R | 1 |
| 15. | Which state is called spice bowl of India? | | CO2 | R | 1 |
| 16. | Which spice is considered as king of spices? | | CO2 | R | 1 |
| 17. | Write the major spices cultivated in Tamil Nadu? | | CO2 | R | 1 |
| 18. | Mention the economic part of clove. | | CO2 | R | 1 |
| 19. | Which is the economic part of cinnamon? | | CO2 | R | 1 |
| 20. | Rapid multiplication propagation technique is followed in which spice? | | CO2 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write in detail the field preparation, spacing, irrigation and nutrient requirement for tomato cultivation. | | CO2 | C | 5 |
| 22. | Discuss the role of growth regulators in cucurbits. | | CO2 | U | 5 |
| 23. | Explain different types of onion with their botanical name. | | CO2 | U | 5 |
| 24. | Enlist different maturity indices of vegetable crops (minimum 5 crops). | | CO2 | U | 5 |
| 25. | Write about seed requirement, seedling production, transplanting and fertilizer requirement for cabbage production. | | CO2 | U | 5 |
| 26. | Explain four varietal characters for tomato, brinjal, onion, pumpkin and cabbage. | | CO2 | U | 5 |
| 27. | Write the flow chart for the preparation of white pepper. | | CO6 | U | 5 |
| 28. | Discuss the physiological disorders observed in root crops. | | CO3 | U | 5 |
| 29. | Explain any 5 varieties with their description of black pepper. | | CO2 | U | 5 |
| 30. | Write the important uses of turmeric and ginger. | | CO1 | C | 5 |
| 31. | Criticize any 5 vegetables with their scientific name, economic part, propagating material. | | CO2 | E | 5 |
| 32. | Discuss about the processed products of ginger, turmeric, pepper and clove. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write the production technology of onion. | CO2 | U | 7.5 |
|  | b. | Write the production technology of cucumber. | CO2 | U | 7.5 |
| 34. | a. | Discuss the different propagation methods followed in black pepper. | CO2 | U | 7.5 |
|  | b. | Write the scope and importance of vegetables and spices cultivation in India. | CO1 | U | 7.5 |
| 35. | a. | Write in detail kitchen garden. | CO4 | U | 7.5 |
|  | b. | Explain the physiological disorders of tomato, brinjal, chilli and potato. | CO3 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Appreciate the role of vegetables and spices in human nutrition and national economy. |
| CO2 | Follow scientific agronomic practices in producing tropical vegetable and spice crops. |
| CO3 | Control pest, diseases, weed and physiological disorders in tropical vegetable and spices crops |
| CO4 | Create and maintain kitchen garden. |
| CO5 | Understanding the harvesting methods of spices and vegetable crops. |
| CO6 | Apply post-harvest technology in vegetable and spice crop. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Level** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | 8.5 | - | - |  | 5 | 15.5 |
| CO2 | 13 | 54.5 | 1 | - | 5 | 5 | 78.5 |
| CO3 | 1 | 12.5 | - | - | - | - | 13.5 |
| CO4 | - | 7.5 | - | - | - | - | 7.5 |
| CO5 | - | - | - | - | - | - | - |
| CO6 |  | 10 |  |  |  |  | 10 |
|  | | | | | | | **125** |



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| **Course Code** | **21HO2272** | **Duration** | **3hrs** |
| **Course Name** | **PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS, MAP AND LANDSCAPING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | A popular flowering plant for indoors \_\_\_\_\_\_  Pick the correct answer  a. Rose b.Hibiscus c. Anthurium d.Nerium | | CO1 | R | 1 |
| 2. | Define mobility in landscaping. | | CO2 | R | 1 |
| 3. | What are the uses of shrubs in landscaping? | | CO2 | U | 1 |
| 4. | Mention any two varieties of tuberose released from IIHR. | | CO5 | R | 1 |
| 5. | Write the scientific name of Isabgol and Aloe. | | CO1 | R | 1 |
| 6. | List the different types of garden. | | CO3 | R | 1 |
| 7. | Give two examples for climbers. | | CO2 | R | 1 |
| 8. | Define ornamental horticulture. | | CO1 | U | 1 |
| 9. | Define aromatic plants. Give examples. | | CO1 | R | 1 |
| 10. | What is bio aesthetic planning. | | CO1 | U | 1 |
| 11. | Mention the propagation material of the following crops  a. Tuberose b. Gladiolus | | CO5 | R | 1 |
| 12. | List the after-care practices followed in chrysanthemum. | | CO6 | R | 1 |
| 13. | Define concrete/oleoresin/resinoid. | | CO6 | R | 1 |
| 14. | Define axis and rhythm in principles of gardening. | | CO3 | R | 1 |
| 15. | Mention the uses of ashwagandha. | | CO5 | U | 1 |
| 16. | What are the methods of essential oil extraction? | | CO6 | R | 1 |
| 17. | Mention the propagation methods followed in cut roses. | | CO5 | R | 1 |
| 18. | Define formal style of gardening. | | CO3 | U | 1 |
| 19. | Define Astro-turf. | | CO4 | R | 1 |
| 20. | Mention any two varieties of gladiolus from India. | | CO5 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write short notes on propagation and planting method in tuberose. | | CO5 | R | 5 |
| 22. | Elaborate the pruning in *Jasmine* sp. | | CO6 | U | 5 |
| 23. | Write a short note on Japanese garden. | | CO3 | U | 5 |
| 24. | Write short notes on types of pinching in carnation. | | CO5 | R | 5 |
| 25. | Mention three species of jasmine with scientific name and examples of varieties. | | CO5 | R | 5 |
| 26. | Write a note on harvest index and grades of cut roses. | | CO6 | R | 5 |
| 27. | Write the harvesting stages of the following crops.  a. Gerbera b. Gladiolus c. Tuberose d. Chrysanthemum e.Jasmine | | CO6 | R | 5 |
| 28. | List the value-added products in medicinal and aromatic plants. | | CO6 | A | 5 |
| 29. | Write in brief on the maintenance of lawn. | | CO4 | R | 5 |
| 30. | Enumerate the difference between cut flowers and loose flowers with examples. | | CO5 | An | 5 |
| 31. | Describe the commercial cultivars of tuberose. | | CO5 | R | 5 |
| 32. | Write short note on importance of roses in garden and list the value-added products from rose. | | CO1 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write a detailed note on production technology of Tube rose. | CO5 | R | 8 |
|  | b. | List the principles of landscaping and add a brief note on the principles. | CO2 | R | 7 |
|  |  |  |  |  |  |
| 34. | a. | Elaborate in detail on the processing and value addition in ornamental crops. | CO6 | A | 7.5 |
|  | b. | Write in detail on the intercultural operation followed in loose flowers. | CO5 | R | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Discuss the scope and importance of ornamental crops in detail. | CO1 | U | 7.5 |
|  | b. | Write in detail on production technology of Jasmine. | CO5 | R | 7.5 |

CO – COURSE OUTCOME BL – BLOOM’S LEVEL

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| --- | --- |
|  | COURSE OUTCOMES |
| CO1 | Highlight the importance of flowers, ornamental crops, medicinal and aromatic plants and landscaping. |
| CO2 | Apply principles of landscaping using trees, shrubs and climbers. |
| CO3 | Design different styles of gardens. |
| CO4 | Establishment of lawn and management. |
| CO5 | Give details on the cultivation practices of Ornamental crops, Medicinal and Aromatic plants (MAPs). |
| CO6 | Handle flower crop, harvesting and post-harvest operation and processing of MAPs. |

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| Assessment Pattern as per Bloom’s Taxonomy | | | | | | | |
| CO / P | R | U | A | An | E | C | Total |
| CO1 | 9.5 | 8 |  |  |  |  | 17.5 |
| CO2 | 1 | 9 |  |  |  |  | 10 |
| CO3 | 6 | 2 |  |  |  |  | 8 |
| CO4 |  | 6 |  |  |  |  | 6 |
| CO5 | 1 | 47 |  | 5 |  |  | 53 |
| CO6 | 5 | 13 | 12.5 |  |  |  | 30.5 |
|  | | | | | | | 125 |



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| **Course Code** | **22AG2308** | **Duration** | **3hrs** |
| **Course Name** | **AGROCHEMICALS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | What is Agrochemicals? | | CO1 | U | 1 |
| 2. | List out major formulation of Pesticides. | | CO1 | R | 1 |
| 3. | What is Granules? | | CO1 | An | 1 |
| 4. | What is fumigants? | | CO1 | A | 1 |
| 5. | What is called as Pesticides? | | CO2 | U | 1 |
| 6. | Write the use of carbamates? | | CO2 | R | 1 |
| 7. | Write the definition of botanical insecticides. | | CO2 | R | 1 |
| 8. | Give function of systemic fungicide. | | CO2 | An | 1 |
| 9. | What is Metalaxyl? | | CO3 | A | 1 |
| 10. | Define Insecticides. | | CO3 | R | 1 |
| 11. | What is the function of Rodenticide. | | CO3 | An | 1 |
| 12. | Define acaricides. | | CO3 | R | 1 |
| 13. | Give the information of Molluscicides. | | CO4 | U | 1 |
| 14. | Define Nematicides. | | CO4 | R | 1 |
| 15. | Define fertilizers. | | CO4 | R | 1 |
| 16. | Give the N Addition through rain-water. | | CO5 | A | 1 |
| 17. | Define complex fertilizers. | | CO5 | R | 1 |
| 18. | What is called as mixed fertilizer? | | CO5 | An | 1 |
| 19. | Write the source of organic potassium. | | CO5 | U | 1 |
| 20. | What is fertilizer grade? | | CO5 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | List out the Classification of pesticides with example. | | CO1 | U | 5 |
| 22. | Give a short note on organic fungicides. | | CO1 | A | 5 |
| 23. | Write the classification of insecticides. | | CO2 | An | 5 |
| 24. | Write an essay of Systemic fungicides. | | CO2 | R | 5 |
| 25. | Write a short note on botanical insecticides. | | CO3 | U | 5 |
| 26. | Write a detail note of ways to minimize pesticide impact. | | CO3 | An | 5 |
| 27. | Give a short note of Fertilizer classification and their importance. | | CO4 | A | 5 |
| 28. | Explain about slow release N-fertilizers. | | CO4 | R | 5 |
| 29. | Mixed and complex fertilizers: Sources and compatibility. | | CO5 | U | 5 |
| 30. | Describe details of Potassium fertilizers. | | CO5 | An | 5 |
| 31. | Explain biofertilizers. | | CO6 | A | 5 |
| 32. | What is the qualifications and power for appointment of fertilizers Inspectors? | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Impact of fertilizers on the environment. | CO1 | U | 7.5 |
|  | b. | Analyze the importance and efficiency of slow- release nitrogen fertilizers with suitable examples. | CO2 | An | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Give brief note classification and fate of herbicides. | CO3 | R | 7.5 |
|  | b. | Explain detail about Inorganic fungicides – characteristics. | CO3 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Explain importance and advantages of Bio-pesticides. | CO5 | An | 7.5 |
|  | b. | Write a brief notes of Fertilizer control order (FCO). | CO6 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the role of agrochemicals for sustainable agriculture. |
| CO2 | Remember the classification and mode of action. |
| CO3 | Familiarize with manufacturing, marketing and logistics. |
| CO4 | Develop skills in calculation, formulations of insecticides. |
| CO5 | Evaluate need based recommendation for various crops. |
| CO6 | Disseminate the plant based bio pesticides for sustainable agriculture. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 1 | 13.5 | 6 | 1 | - | - | 21.5 |
| CO2 | 7 | 1 | - | 13.5 | - | - | 21.5 |
| CO3 | 9.5 | 5 | 8.5 | 6 | - | - | 29 |
| CO4 | 7 | 1 | 5 | - | - | - | 13 |
| CO5 | 1 | 6 | 2 | 13.5 | - | - | 22.5 |
| CO6 | 7.5 | 5 | 5 | - | - | - | 17.5 |
|  | | | | | | | **125** |



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| **Course Code** | **22AG3400** | **Duration** | **3hrs** |
| **Course Name** | **MEMBRANE TECHNOLOGY FOR WATER AND WASTEWATER TREATMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Discuss in detail the principle involved in separation process and membrane filtration. | CO1 | U | 10 |
|  | b. | Compare the features, advantages and limitation of various pressure driven membranes. | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Differentiate pressure driven and electrically driven processes in water purification. | CO1 | An | 10 |
|  | b. | Discuss in detail on various materials used for membrane fabrication. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Compare and contrast dead-end and cross flow filtration. | CO2 | An | 10 |
|  | b. | Discuss the solution-diffusion model in membrane transport studies. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the working principles of tubular, plate and frame membrane modules in water treatment. | CO2 | U | 10 |
|  | b. | Outline the significance of zetapotential and contact angle in evaluating the membrane performance for water purification. | CO5 | Ap | 10 |
|  |  |  |  |  |  |
| 5. | a. | List down the soluble and insoluble polymers used in membrane preparation. How are the ceramic membranes fabricated? | CO3 | Ap | 10 |
|  | b. | Explain how the polysulphone membranes are fabricated using phase inversion method. | CO3 | Ap | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Differentiate non-solvent induces phase inversion and vapor-induced phase inversion method in fabrication of membranes for water purification. | CO3 | An | 10 |
|  | b. | Explain how nanofibers are produced using electrospinning? | CO3 | Ap | 10 |
|  |  |  |  |  |  |
| 7. | a. | List the properties of membranes to be characterized and tested in the laboratory. How the swelling property and porosity of the membrane affects the performance of membrane in salt removal? | CO4 | Ev | 10 |
|  | b. | How is the surface morphology of the fabricated membrane tested in the laboratory? | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain how the fouling mechanism affects the performance of the membrane in water purification. | CO6 | U | 10 |
|  | b. | List the types of foulants and antifouling materials. Discuss in detail how the scaling or fouling can be prevented. | CO6 | Ap | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Present a case study in application of nanocomposite membrane in rejection of salt from the contaminated water. | CO5 | E | 10 |
|  | b. | List down the preparatory methods of ion exchange membranes. Explain any one of them in detail. | CO3 | U | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Identify and fabricate suitable type of membranes (polymeric and ceramic) based on the type of treatment (drinking water, groundwater or wastewater). |
| CO2 | Optimize the operational and design parameters of polymeric membranes for specific ion removal. |
| CO3 | Test the fabricated membranes for strength, porosity and stability. |
| CO4 | Analyse the characteristics of membranes. |
| CO5 | Evaluate the performance of polymeric/ceramic membranes in removal of ions. |
| CO6 | Select the suitable type of membrane material to avoid membrane fouling. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **Ap** | **An** | **E** | **C** | **Total** |
| CO1 | - | 20 | - | 20 | - | - | 40 |
| CO2 | - | 20 | - | 10 | - | - | 30 |
| CO3 | - | 10 | 30 | 10 | - | - | 50 |
| CO4 | - | - | - | 10 | 10 | - | 20 |
| CO5 | - | - | - | 10 | 10 | - | 20 |
| CO6 | - | 10 | 10 | - | - | - | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **22HO2275** | **Duration** | **3hrs** |
| **Course Name** | **LANDSCAPING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Write a short note on Japanese garden. | | CO3 | U | 1 |
| 2. | Mention the different components of texture. | | CO1 | R | 1 |
| 3. | What is a fern? Give examples. | | CO2 | R | 1 |
| 4. | List out the steps in dry flower making. | | CO4 | R | 1 |
| 5. | What are the categories of bonsai based on style? | | CO4 | R | 1 |
| 6. | Define xeriscaping. | | CO4 | U | 1 |
| 7. | What are all the species of grasses in lawn making? | | CO2 | R | 1 |
| 8. | Define terrarium/ bottle garden. | | CO4 | U | 1 |
| 9. | List out the uses of vertical garden. | | CO3 | R | 1 |
| 10. | Give examples for any four famous gardens in India. | | CO3 | R | 1 |
| 11. | How is a balance created in the design? | | CO6 | An | 1 |
| 12. | What is emphasis or focalization? | | CO1 | U | 1 |
| 13. | Define wild garden. | | CO3 | U | 1 |
| 14. | Write the uses of shrubs in landscaping. | | CO2 | A | 1 |
| 15. | What is the effect of color in landscaping? | | CO1 | An | 1 |
| 16. | Define Ikebana technique in flower arrangement. | | CO4 | U | 1 |
| 17. | List any four trees suitable for avenue planting. | | CO2 | R | 1 |
| 18. | Define Astro turf. | | CO4 | U | 1 |
| 19. | Give example for the following group:  a. grass plants  b. flowering annuals  c. bonsai  d. border plants | | CO2 | R | 1 |
| 20. | List the non-living components in a garden. | | CO3 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the scope of landscape gardening. | | CO2 | An | 5 |
| 22. | Discuss the key features of English garden. | | CO3 | R | 5 |
| 23. | List the environmental and financial benefits of roof garden. | | CO3 | An | 5 |
| 24. | Write the importance of flower arrangement. | | CO4 | U | 5 |
| 25. | What are the types of lawn and enumerate its importance in a garden. | | CO4 | R | 5 |
| 26. | Enlist and explain the principles of garden. | | CO1 | R | 5 |
| 27. | Explain in brief on formal garden. | | CO3 | U | 5 |
| 28. | Briefly discuss the different styles of flower arrangement. | | CO4 | U | 5 |
| 29. | Differentiate formal and informal gardens. | | CO3 | A | 5 |
| 30. | What are the components of garden and its adornments? | | CO3 | R | 5 |
| 31. | Write a brief note on history of gardening in India. | | CO1 | R | 5 |
| 32. | List and write a brief note on plant components of landscaping. | | CO1 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Explain informal garden with a layout diagram of your own creativity. | CO3 | C | 7.5 |
|  | b. | Discuss the maintenance activities in a bonsai. | CO4 | R | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Uses of CAD and features in garden designing. | CO5 | U | 10 |
|  | b. | Explain the following principle of landscape design  a. Open centre  b. Repetition | CO1 | R | 5 |
|  |  |  |  |  |  |
| 35. | a. | Discuss the factors affecting landscape design. | CO1 | A | 6 |
|  | b. | Write a detailed note on establishment and maintenance of lawn. | CO4 | R | 9 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Understand the principles of ornamental horticulture and landscape design. |
| CO2 | Explain about the different ornamental crops and its suitability to different landscapes . |
| CO3 | Distinguish the different garden types of India and in abroad. |
| CO4 | Create unique lawn, floral arrangements, terrariums, xeriscaping and bonsai designs. |
| CO5 | Explore the different landscaping designs and architectures using AutoCAD and ArchCAD. |
| CO6 | Identify the factors affecting the landscape design and planning. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 21 | 1 | 7 | 1 | - | - | 30 |
| CO2 | 4 | - | - | 5 |  |  | 9 |
| CO3 | 13 | 7 | 5 | 5 | - | 7.5 | 37.5 |
| CO4 | 23.5 | 14 | - | - | - | - | 37.5 |
| CO5 | - | 10 | - | - | - | - | 10 |
| CO6 | - | - | - | 1 | - | - | 1 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG1451** | **Duration** | **3hrs** |
| **Course Name** | **INTRODUCTORY SOIL AND WATER CONSERVATION ENGINEERING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Gully erosion is the advanced stage of \_\_\_\_\_\_\_\_\_\_ erosion.  a) Wind b) Water c) Rill d) Splash | | CO2 | R | 1 |
| 2. | The bench terrace is applied in areas of slope higher than \_\_\_\_\_\_\_\_.  a) One percent b) 5 percent c) 15 percent d) 10 percent | | CO6 | An | 1 |
| 3. | The rain has \_\_\_\_\_\_\_\_\_\_\_\_ more kinetic energy than runoff.  a) 256 times b) 196 times c) 106 times d) 356 times | | CO1 | An | 1 |
| 4. | Soil loss is more sensitive to \_\_\_\_\_\_\_\_  a) Slope length b) Slope steepness c) Slope direction d) Normal factor | | CO3 | U | 1 |
| 5. | Contour bunds are preferred in \_\_\_\_\_\_\_rainfall area.  a) high b) low c) very high d) medium | | CO4 | R | 1 |
| 6. | \_\_\_\_\_\_\_\_\_\_\_ is referred as movement of soil particles in a series of bounces over a soil surface.  a) Saltation b) Creep c) Suspension d) Sand dunes | | CO1 | U | 1 |
| 7. | Graded bund is adopted in areas where rainfall more than \_\_\_\_\_\_\_.  a) 30 cm b) 75 cm c) 60 cm d) 55 cm | | CO6 | An | 1 |
| 8. | Soil erosion is more in  a) Sandy soil b) Silty soil c) Clay loam d) Peaty soil | | CO1 | R | 1 |
| 9. | Engineering control measures of soil erosion include  a) Wind break b)Terraces c) Bunds d) Bunds and Terraces | | CO4 | A | 1 |
| 10. | When trees and shrubs are planted in long rows at regular intervals, they are described as  a) Wind breaks b) Shelter belts c) Basin listers d) Soil binders | | CO6 | R | 1 |
| 11. | ……………… is the practice of maintaining crop residues at the ground surface offers good protection from Soil Blowing. | | CO5 | U | 1 |
| 12. | In Conservation tillage, …………. crop residue left after planting. | | CO4 | A | 1 |
| 13. | The gully cuts to the C-horizon and the parent material are removed as  ……….. | | CO2 | An | 1 |
| 14. | The portion of ……………. % of the soil erosion by wind takes place in saltation | | CO5 | E | 1 |
| 15. | Universal soil loss equation was proposed by …………in 1959 | | CO3 | R | 1 |
| 16. | ………….is considered as Third Phase of Soil Erosion. | | CO1 | U | 1 |
| 17. | ………… gullies are formed in areas where the subsoil is more resistant to erosion | | CO2 | R | 1 |
| 18. | Dune means……………. | | CO5 | R | 1 |
| 19. | …………is wider barrier than wind break, constructed by more than two rows, usually at right angles to the direction of prevailing wind. I | | CO5 | U | 1 |
| 20. | Universal soil loss equation (USLE) is P = ……………… | | CO3 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss the Causes of Soil Erosion. | | CO1 | U | 5 |
| 22. | State Wind Break and Shelter belts. | | CO6 | R | 5 |
| 23. | Explain Gully Erosion. What are the processes involved in Gully Erosion? | | CO2 | U | 5 |
| 24. | List out the Water Harvesting Techniques in Hilly Slopes and Explain them. | | CO4 | R | 5 |
| 25. | Abbreviate USLE and Discuss the Limitations. | | CO3 | U | 5 |
| 26. | Define Wind Erosion. Write down the Mechanics of Wind Erosion. | | CO5 | R | 5 |
| 27. | What are the types of Bench Terraces? Explain them with neat sketch. | | CO4 | A | 5 |
| 28. | Write down the uses of USLE. | | CO3 | A | 5 |
| 29. | Explain in brief about sand dunes and List out its classification. | | CO6 | U | 5 |
| 30. | Interpret the Stages of Gully Development. | | CO2 | A | 5 |
| 31. | Discuss about the Evil Effects of Water Erosion. | | CO1 | U | 5 |
| 32. | List out the factors affecting wind erosion and state them in brief Manner. | | CO5 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | (i) Define the energy involved in part of soil erosion.  (ii)List out the factors affecting soil erosion. Explain them. | CO1 | R | 4  4 |
|  | b. | Interpret with a brief explanation about water harvesting techniques. | CO4 | A | 7 |
| 34. | a. | Interpret in detail about the USLE. | CO3 | A | 8 |
|  | b. | Sketch out the Classification on Gullies with brief explanation. | CO2 | A | 7 |
| 35. | a. | Discuss in detail about the evil effects of wind erosion. | CO5 | U | 6 |
|  | b. | State about control measures of wind erosion. | CO6 | R | 9 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand basic concepts of soil and water conservation |
| CO2 | Explain the gully erosion control measures |
| CO3 | Measure the soil loss using different techniques |
| CO4 | Explain the water harvesting techniques |
| CO5 | Understand the mechanics of wind erosion |
| CO6 | Explain the different control measures of wind erosion |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 8 | 12 | - | 1 | - | - | 21 |
| CO2 | 2 | 5 | 12 | 1 | - | - | 20 |
| CO3 | 1 | 6 | 14 | - | - | - | 21 |
| CO4 | 6 | - | 15 | - | - | - | 21 |
| CO5 | 11 | 9 | - | - | 1 | - | 21 |
| CO6 | 14 | 5 | - | 2 | - | - | 21 |
|  | | | | | | | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG1503** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF CROP PHYSIOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Which type of tissue has lignified cell walls?   1. Parenchyma B) Collenchyma C) Sclerenchyma D) Cambium | | CO1 | U | 1 |
| 2. | The plant tissue become woody by a process of \_\_\_\_\_\_\_\_\_\_\_   1. Suberisation B) Pectification C) Calcification D) Lignifications | | CO1 | R | 1 |
| 3. | Most metabolism of the plants is carried in tissue \_\_\_\_\_\_\_\_\_\_\_   1. Phloem B) Collenchymas C) Meristem D) Parenchymas | | CO1 | A | 1 |
| 4. | Which of the following does not affect the rate of diffusion? A) Temperature B) Pressure C) ATP available D) Concentration gradient | | CO2 | R | 1 |
| 5. | **Transpiration is regulated by the movements of \_\_\_\_\_\_\_\_\_\_**  A) Parenchyma cells B) Guard cells C) Epithelial cells  D) None of the above | | CO2 | U | 1 |
| 6. | **The movement of materials from the leaves to other tissues of the plant is called \_\_\_\_\_\_\_\_\_**  A) Tropic movement B) Guttation C) Transpiration D) Translocation | | CO2 | An | 1 |
| 7. | Nitrate reductase system in which element is major component?  A) Mo B) N C) H D) None of the above | | CO3 | R | 1 |
| 8. | Which element is essential for activating the enzyme but not a part of enzyme?  A) Mn B) Mg C) K D) Co | | CO3 | R | 1 |
| 9. | In leguminous plants leghemoglobin protects \_\_\_\_\_ activity  A) Nitrogenase B) Protiase C) Nitrate reductase D) Both A and B | | CO3 | R | 1 |
| 10. | Which of the Following is Known as a Hatch-slack Pathway?   1. C2 Pathway B) C3 Pathway C) C4 Pathway D) C5 Pathway | | CO4 | U | 1 |
| 11. | Which Metabolic Pathway Produces Carbohydrate?  A) Glycolysis B) Krebs cycle C) Cyclic electron pathway D) Calvin cycle | | CO4 | A | 1 |
| 12. | The Hill Reaction Takes Place in \_\_\_\_\_\_\_\_\_\_  A) Stroma B) Grana of chloroplast C) Both a & b D) None of the above | | CO4 | E | 1 |
| 13. | A Dark Reaction Takes Place in \_\_\_\_\_\_\_\_\_\_\_\_  A) Grana B) Stroma C) The stroma of chloroplast D) Mitochondria | | CO4 | R | 1 |
| 14. | What is the Rate of Photosynthesis in C4 Plants?  A) Higher B) Moderate C) Low D) Very low | | CO4 | R | 1 |
| 15. | Hormone primarily connected with cell division is   1. IAA B) NAA C) Cytokinin/zeatin D) Gibberellic acid | | CO5 | U | 1 |
| 16. | Gibberellins promote \_\_\_\_\_\_\_\_\_\_   1. Seed germination B) Seed dormancy C) Leaf fall  D) Root elongation | | CO5 | U | 1 |
| 17. | Due to the Uneven Distribution of \_\_\_\_\_\_\_\_\_\_ Phototropic Curvature Occurs.   1. Auxin B) Cytokinins C) Phytochrome D) Gibberellin | | CO5 | A | 1 |
| 18. | CGR stands for \_\_\_\_\_\_\_\_  A) Crop growth rate B) Crop growth regulator C) Crop growth relative time D) Crop growth ratio | | CO6 | R | 1 |
| 19. | The leaf area index at which the maximum CGR is recorded is called as  A) optimum leaf area index B) Leaf area duration  C) Crop growth relative time D) Crop growth ratio | | CO6 | U | 1 |
| 20. | Relative growth rate also referred as \_\_\_\_\_\_\_\_\_  A) Crop growth rate B) Crop growth index C) efficiency index D) vigor index | | CO6 | A | 1 |
| PART – B (10 X 5 = 50 MARKS)  (Answer any 10 from the following) | | | | | |
| 21. | Explain shortly about the physiology of plant tissues. | | CO1 | U | 5 |
| 22. | Differentiate the plant cell from animal cell. | | CO1 | R | 5 |
| 23. | Write the significance of transpiration? | | CO2 | E | 5 |
| 24. | Explain the open and close mechanism in dicot and monocot plant. | | CO2 | A | 5 |
| 25. | Give the deficiency and excess of nutrients symptoms for following nutrients.   1. Nitrogen B) Phosphorus C) Potassium D) Calcium E) Sulfur | | CO3 | An | 5 |
| 26. | Give functional detail of mineral nutrient in plant. | | CO3 | R | 5 |
| 27. | Give difference details in Light and Dark reactions. | | CO4 | U | 5 |
| 28. | Give difference details between C3 and C4 pathway. | | CO4 | E | 5 |
| 29. | Difference between Plant growth regulators and plant growth inhibitor. | | CO5 | A | 5 |
| 30. | Give details about the plant hormones – founding place and function in plant. | | CO5 | C | 5 |
| 31. | Explain the term of AGR, RGR and CGR. | | CO6 | An | 5 |
| 32. | What are the Physiological growth parameters in crop? | | CO6 | U | 5 |
| PART – C (2 X 15 = 30 MARKS)  (Answer any 2 from the following) | | | | | |
| 33. | a. | Explain the plant cell anatomy with the neat diagram. | CO1 | R | 15 |
|  | b. | Explain the transpiration process, mechanism and factors affecting transpiration in plant cell. | CO2 | U | 15 |
|  |  |  |  |  |  |
| 34. | a. | Briefly explain the nutrient uptake mechanisms in plantsand it factor affecting issues. | CO3 | R | 15 |
|  | b. | Explain the EMP pathway with neat representation. | CO4 | An | 15 |
|  |  |  |  |  |  |
| 35. | a. | Explain the Steps involved in Kreb’s cycle and its significance. | CO4 | An | 15 |
|  | b. | Explain the phases of plant growth. | CO6 | A | 15 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the physiology of plant tissues and cells. |
| CO2 | Remember water movement in plant systems like diffusion and osmosis. |
| CO3 | Apply the concept of water relations, mineral uptake in the field of agriculture. |
| CO4 | Summarize the various physiological processes. |
| CO5 | Measure and analyze the physiological parameters of crops. |
| CO6 | Practice the use of growth regulators correctly to solve physiological problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 21 | 6 | 1 | - | - | - | 28 |
| CO2 | 1 | 1 | 5 | 1 | 5 | - | 13 |
| CO3 | 8 | - | - | 5 | - | - | 13 |
| CO4 | 2 | 6 | 1 | 30 | 6 | - | 45 |
| CO5 | - | 2 | 6 | - | - | 5 | 13 |
| CO6 | 1 | 6 | 1 | 5 | - | - | 13 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3003** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES AND PRACTICES OF WEED MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Define Aquatic weed. | | CO1 | U | 1 |
| 2. | Give the concepts of weeds. | | CO1 | R | 1 |
| 3. | ………, ………. are the mimicry weeds of wheat and rice. | | CO1 | R | 1 |
| 4. | Define Bio-herbicides. | | CO1 | An | 1 |
| 5. | Well grown broad leaved weeds*, Trianthema portulacastrum* produces ……… seeds per plant. | | CO2 | A | 1 |
| 6. | Define Voilures Co-efficient. | | CO2 | E | 1 |
| 7. | Weeds causes ………. & ………% of yield loss in rice and sugarcane | | CO2 | An | 1 |
| 8. | Give an example for low dose herbicide for early post emergence in direct seeded rice……… | | CO2 | U | 1 |
| 9. | Explain General Characters of Wetland Weed. | | CO3 | R | 1 |
| 10. | ………herbicide kill all the vegetation without regards to species example……… | | CO3 | A | 1 |
| 11. | Define Allelopathy. | | CO4 | R | 1 |
| 12. | Inhibitors of photosynthesis done by ……… and ……….. herbicides. | | CO5 | An | 1 |
| 13. | *Phalaris minor* in wheat can be controlled by ……….. herbicide. | | CO3 | R | 1 |
| 14. | Define Solarisation. | | CO3 | U | 1 |
| 15. | Chemical which are used to inactivate applied herbicides are  called……. | | CO5 | U | 1 |
| 16. | Glyphosate block ……….. pathway in plants. | | CO5 | R | 1 |
| 17. | Weed seeds that are incompletely digested and carried away by the digestive tracts of animal is called as ……….. | | CO4 | A | 1 |
| 18. | Leaves and inflorescence of *Parthenium spp.,* affects the germination and seedling growth of ………. & ………… crops. | | CO5 | R | 1 |
| 19. | A toxic chemical which is present in herbicide is called as……… | | CO6 | U | 1 |
| 20. | ……….. weed possess all three types of dormancy. | | CO6 | R | 1 |
|  | **PART – B (10 X 5 = 50 MARKS) (Answer any 10 from the following)** | |  |  |  |
| 21. | Explain about crop weed competition with suitable examples. | | CO2 | R | 5 |
| 22. | Write about mechanism of weed seed dispersal. | | CO3 | R | 5 |
| 23. | Suggest a suitable IWM for rice and sugarcane crops. | | CO3 | An | 5 |
| 24. | Briefly explain about aquatic weeds management. | | CO3 | A | 5 |
| 25. | Explain effect of allelopathy on crop on weed, weed on crop & weed on weed. | | CO3 | U | 5 |
| 26. | Explain about weed seed dormancy with examples. | | CO3 | R | 5 |
| 27. | List out the causes of weed shift and suggest ways to overcome the weed shift. | | CO5 | U | 5 |
| 28. | Brief about different types of herbicide formulation. | | CO4 | R | 5 |
| 29. | Briefly discuss the nano-technological approaches for weed management. | | CO5 | R | 5 |
| 30. | Explain about types of parasitic weeds and their host plant & there management. | | CO6 | A | 5 |
| 31. | Explain about Herbicide rotation in weed management. | | CO5 | C | 5 |
| 32. | How does herbicide drift occur? Suggest ways and means control herbicide drift effects. | | CO6 | U | 5 |
|  | **PART – C (2 X 15 = 30 MARKS) (Answer any 2 from the following)** | |  |  |  |
| 33. | a. | Write a note on the classification of weeds and list out any five classifications with suitable example. | CO1 | R | 8 |
|  | b. | Explain about different mechanical weed management methods. | CO1 | An | 7 |
| 34. | a. | Brief about mechanism and mode of action of herbicides in plants. | CO5 | U | 7 |
|  | b. | Brief about fate of herbicide degradation in soil and plants. | CO3 | R | 8 |
| 35. | a. | Explain different methods of herbicide application with examples. | CO6 | C | 8 |
|  | b. | Explain about advantages & disadvantages of herbicides. | CO6 | An | 7 |

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|  | **COURSE OUTCOMES** |
| CO1 | Identify different types of weeds and their ecosystem. |
| CO2 | Understand the weeds survival mechanisms. |
| CO3 | Recommend herbicides for weed management in field crops. |
| CO4 | Adopt different weed control methods for crop production. |
| CO5 | Apply integrated weed management practices. |
| CO6 | Workout the economics of weed control. |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  |  | **Assessment Pattern as per Bloom’s Level** | | | |  |  |
| CO / P | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 10 | 1 | - | 8 | - | - | 19 |
| CO2 | 5 | 1 | 1 | 1 | 1 | - | 9 |
| CO3 | 20 | 6 | 6 | 5 | - | - | 37 |
| CO4 | 5 | - | 1 | 1 | - | - | 7 |
| CO5 | 7 | 13 | - | 1 | - | 5 | 26 |
| CO6 | 1 | 6 | 5 | 7 | - | 8 | 27 |
|  |  |  | | | |  | **125** |



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| --- | --- | --- | --- |
| **Course Code** | **21AG3004** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES AND PRACTICES OF WATER MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | The source of all kinds of water on earth is --------------- . | | CO1 | U | 1 |
| 2. | An area of land where all water drains to a central point like a lake, river, or stream is known as ----------------------. | | CO1 | R | 1 |
| 3. | Soil -------------- refers to the relative proportion of various sized particles in a given soil. | | CO | R | 1 |
| 4. | Permanent wilting point is the ------------------- limit of soil moisture available to plants. | | CO1 | An | 1 |
| 5. | Capillary water is held between water potentials of -------- to --------- bars. | | CO1 | A | 1 |
| 6. | ET + water used for metabolic activities of plants is termed as ------------- use of water. | | CO2 | E | 1 |
| 7. | Reference crop ET (ETo ) = ------------ x Kpan. | | CO2 | An | 1 |
| 8. | Actual crop ET under saturated condition (ETc) = ETo x ------ . | | CO2 | U | 1 |
| 9. | The process of planning how much, how often and how best to irrigate to maintain crop in good health is known as ---------------- of irrigation. | | CO3 | R | 1 |
| 10. | ------------------- irrigation requirement is the amount of irrigation water just required to bring the soil moisture content in the root zone depth of the crop to field capacity. | | CO3 | A | 1 |
| 11. | If net irrigation requirement is 500 mm and irrigation efficiency of the system is 80 %, the gross irrigation requirement is --------- mm. | | CO4 | An | 1 |
| 12. | If 5.0 cm of water is to be applied in irrigation in 1.0 ha of cropped land ----------------- litres of water is needed. | | CO5 | An | 1 |
| 13. | ------------------ irrigation is the most inefficient method of irrigation where only about 20 per cent of water is actually used by plants. | | CO3 | R | 1 |
| 14. | ------------- irrigation is the application of water into the furrows intermittently in a series of relatively short ON and OFF times of irrigation cycle. | | CO3 | U | 1 |
| 15. | ------------- is connected to the drip unit to inject dissolved fertilizers into the water in the drip unit. | | CO5 | U | 1 |
| 16. | ------------- system of micro irrigation has an irrigation efficiency of about 90 - 95 %. | | CO5 | R | 1 |
| 17. | International Water Management Institute has proposed a change of the nomenclature from ‘water use efficiency’ to ‘water ------------------. | | CO4 | A | 1 |
| 18. | Most important critical stage for irrigation in wheat crop is ---------. | | CO5 | R | 1 |
| 19. | The fraction of the irrigation water that must be percolated out of the bottom of the root zone in order to prevent average soil salinity from rising above some specifiable level is known as ----------------- requirement. | | CO6 | U | 1 |
| 20. | ----------------------- is caused in a location when the inflow of water into it exceeds the outflow resulting in progressive rise of water table. | | CO6 | R | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Explain water requirement of crops based on demand of water. | | CO2 | C | 5 |
| 22. | Calculate the depth of irrigation (cm) in wheat crop from the following parameters? Effective root zone depth = 75 cm, DASM allowable = 50 %, FC= 24 %, PWP = 12 %, BD = 1.4 g/cm3. | | CO3 | E | 5 |
| 23. | Explain scheduling of irrigation based on Epan reading with suitable examples. | | CO3 | E | 5 |
| 24. | Find out CPE for scheduling irrigation in a crop of sugarcane, if ideal IW/CPE ratio is 0.8 and IW is 50 mm. | | CO3 | An | 5 |
| 25. | Write a short note on Border strip irrigation. | | CO3 | U | 5 |
| 26. | Explain the advantages and disadvantages of micro sprinkler irrigation. | | CO3 | R | 5 |
| 27. | Write a short note on drip fertigation. | | CO5 | U | 5 |
| 28. | What is water productivity? Give a brief description about water productivity. | | CO4 | C | 5 |
| 29. | Explain drip irrigation in sugarcane. | | CO5 | A | 5 |
| 30. | Explain the improvement of saline and sodic soils through water management. | | CO6 | A | 5 |
| 31. | Write a short note on micro irrigation systems in controlled environments. | | CO5 | C | 5 |
| 32. | Explain how water becomes saline and the water quality classes based on EC by USDA. | | CO6 | R | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write in detail about Soil Plant Atmospheric Continuum. | CO1 | E | 7 |
|  | b. | Discuss the factors affecting water availability to plants. | CO1 | An | 8 |
|  |  |  |  |  |  |
| 34. | a. | Write in detail about drip irrigation, types and advantages. | CO3 | R | 8 |
|  | b. | Define drip fertigation. Explain the fertilizers used for drip fertigation. | CO5 | U | 7 |
|  |  |  |  |  |  |
| 35. | a. | What is leaching requirement (LR). Calculate LR and total depth of water needed to meet both the crop demand and LR (AW) for a maize crop from following parameters. ECw =1.2 dS/m, ECe =2.5 dS/M, ET=800 mm. Irrigation efficiency- 75 %. Explain the results also. | CO6 | C | 8 |
|  | b. | Explain the reasons water logging. Discuss in detail about the surface drainage methods. | CO6 | A | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Understand the role of water in crop production, soil moisture - forms, movement, retention, constants, water resources of India and TN. |
| CO2 | Know the water requirement of crops- its estimation, effect of moisture stress on plant growth. |
| CO3 | Study scheduling of irrigation and different methods of irrigation and their layout. |
| CO4 | Study ways to improve water use efficiency, irrigation efficiency. |
| CO5 | Understand water management practices in different crops, drip fertigation. |
| CO6 | Study quality of irrigation water, water management in problem soils and drainage of excess water from crop fields. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 2 | 1 | 1 | 9 | 7 | - | 20 |
| CO2 |  | 1 |  | 1 | 1 | 5 | 8 |
| CO3 | 15 | 6 | 1 | 5 | 10 | - | 37 |
| CO4 | - | - | 1 | 1 | - | 5 | 7 |
| CO5 | 2 | 13 | 5 | 1 | - | 5 | 26 |
| CO6 | 6 | 1 | 12 | - | - | 8 | 27 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3007** | **Duration** | **3hrs** |
| **Course Name** | **DRYLAND FARMING AND WATERSHED MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | **Major irrigation project covers an area of ---------.** | | CO2 | U | 1 |
| 2. | **Irrigation project covered 2,000 to 10,000 ha of CCA ---------.** | | CO3 | R | 1 |
| 3. | **The areas receiving average annual rain fall > 1150 mm are categories as ------.** | | CO4 | An | 1 |
| 4. | **The alternate crops recommended to sow under late onset of monsoon -------.** | | CO6 | A | 1 |
| 5. | **The length of growing period, suitable for growing only a single dry land crop ---------.** | | CO2 | U | 1 |
| 6. | **The chemical accumulated during drought condition --------.** | | CO1 | U | 1 |
| 7. | **Which crop rotation under dryland situation will be more remunerative?** | | CO2 | R | 1 |
| 8. | **The chemicals used to check transpiration losses of water -----------.** | | CO5 | A | 1 |
| 9. | Give the full form of ICRISAT. | | CO1 | A | 1 |
| 10. | What is evasion?  (a) It is the simplest way of reducing the effect of drought. (b) It is the simplest way of adaptation of plant to drought. (c) Both a and b. (d) None of the above. | | CO3 | An | 1 |
| 11. | **Water harvesting in situ is known as --------------.** | | CO4 | R | 1 |
| 12. | Which of the following stage is the critical stage for water requirement in cotton?   1. Booting 2. Tasseling 3. Boll formation 4. Pod formation | | CO6 | U | 1 |
| 13. | Which plant is recommended as an alternate crop to for sowing under late onset of monsoon? | | CO2 | An | 1 |
| 14. | Dry farming is common in  a. Humid regions b. Cold regions c.Arid regions d. Semi-arid regions | | CO2 | U | 1 |
| 15. | Which of the following nutrients becomes deficient under the water logging condition?  a) Zn b) Cu c) Both a and b d) None of the above | | CO4 | R | 1 |
| 16. | Consider about irrigation.   1. Indian agriculture depends on irrigation. 2. History of irrigation is 5,000 years old. 3. It has no role in crop protection. 4. Irrigation plays role in weed control. 5. It doesn’t affect soil consolidation.   a) Only 1, 2, and 3 are true b) Only 3 and 5 are true c) All are true d) Only 2 and 4 are true | | CO2 | A | 1 |
| 17. | **Micro watershed covers an area of about --------------.** | | CO4 | An | 1 |
| 18. | When is crop plan suggested?  (a) Live saving irrigation at any time. (b) Life saving irrigation at the later stage of plant. (c) Life saving irrigation at only a critical growth stage. (d) Any of the above. | | CO2 | R | 1 |
| 19. | What is percolation?  a) Filtration of water through soil b) Filtration of water through rocks  c) Both a and b d) None of the above | | CO6 | E | 1 |
| 20. | **Growth retardant type antitranspirents is -----------.** | | CO1 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Define dryland farming. Discuss briefly its characteristics. | | CO1 | U | 5 |
| 22. | Differentiate between dryland farming and rainfed farming. | | CO2 | A | 5 |
| 23. | Define agricultural drought. | | CO1 | U | 5 |
| 24. | Explain about crop Adaptations. | | CO3 | R | 5 |
| 25. | Define conservation tillage and describe different type of conservation tillage. | | CO3 | An | 5 |
| 26. | Define watershed. Discuss the principles of watershed management. | | CO4 | U | 5 |
| 27. | Explain the modern concepts of Tillage. | | CO3 | R | 5 |
| 28. | Differentiate between Drought escape plant and Drought tolerant plant. | | CO5 | E | 5 |
| 29. | Explain the agronomic measures of soil conservation. | | CO2 | U | 5 |
| 30. | Explain contingency cropping system. | | CO3 | C | 5 |
| 31. | Describe the salient findings of fertilizer use research in dry land agriculture. | | CO1 | U | 5 |
| 32. | Discuss the water Harvesting. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss about progress of dryland Agricultural Research in India. | CO1 | R | 8 |
|  | b. | Explain the strategies for drought management**.** | CO3 | U | 7 |
| 34. | a. | Briefly describe the important components of watershed management programme. | CO5 | An | 7.5 |
|  | b. | Define tillage. Briefly describe about forms of minimum tillage. | CO3 | U | 7.5 |
| 35. | a. | Choice of crops and varieties – cropping systems in drylands. | CO2 | A | 7 |
|  | b. | Briefly discuss about supplemental irrigation system. | CO4 | R | 8 |

CO – COURSE OUTCOME BL – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand sustainable agriculture practices under dryland conditions. |
| CO2 | Correlate soil and climatic conditions of drylands for successful crop production. |
| CO3 | Explain the various crop management techniques and the adaptation strategies for dryland agriculture. |
| CO4 | Formulate contingent water planning for aberrant weather conditions. |
| CO5 | Learn the different types of watershed management strategies. |
| CO6 | Apply the knowledge of different water conservation methods and water management strategies for dryland farming. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | R | U | A | An | E | C | Total |
| CO1 | 8 | 17 | 1 | - | - | - | 26 |
| CO2 | 2 | 8 | 13 | 1 | - | - | 24 |
| CO3 | 11 | 14.5 | - | 6 | - | 5 | 36.5 |
| CO4 | 10 | 5 | - | 2 | - | - | 17 |
| CO5 | - | - | 1 | 7.5 | 5 | - | 13.5 |
| CO6 | - | 6 | 1 | - | 1 | - | 8 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3012** | **Duration** | **3hrs** |
| **Course Name** | **PRINCIPLES AND PRACTICES OF ORGANIC FARMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 01 = 20 MARKS)** | | | | | |
| 1. | Write a note on Integrated Farming System approach. | | CO2 | U | 1 |
| 2. | Write a short note on off farm resources used in organic farming. | | CO2 | R | 1 |
| 3. | List out central government schemes for promotion of organic farming. | | CO5 | R | 1 |
| 4. | Write the role of IFOAM. | | CO6 | A | 1 |
| 5. | Give the role of crop residues in organic agriculture. | | CO3 | U | 1 |
| 6. | What is Organic Certification? | | CO5 | R | 1 |
| 7. | Enlist four fractions of soil organic matter. | | CO3 | R | 1 |
| 8. | Define Bio-Composting. | | CO3 | A | 1 |
| 9. | Define Biodynamic agriculture. | | CO4 | R | 1 |
| 10. | What are keystone species? | | CO2 | R | 1 |
| 11. | What do mean by conservation tillage? | | CO4 | U | 1 |
| 12. | What is cover crop? | | CO2 | U | 1 |
| 13. | Write about permaculture farming. | | CO1 | R | 1 |
| 14. | What is meant by carbon trading? | | CO1 | R | 1 |
| 15. | Write the advantages of crop rotation. | | CO3 | R | 1 |
| 16. | What is Soil solarisation? | | CO4 | A | 1 |
| 17. | Define vertical mulch. | | CO3 | A | 1 |
| 18. | What do you mean by bio-mineralizer | | CO3 | U | 1 |
| 19. | What is Bulky organic manure.? | | CO3 | R | 1 |
| 20. | What is trap cropping? | | CO4 | A | 1 |
| **PART - B (10 X 05 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Write short notes on the need to practice organic farming in the present context. | | CO1 | E | 5 |
| 22. | Write about spatial patterns of diversity. | | CO2 | U | 5 |
| 23. | How to ensure a farm is under conservation from conventional to organic? | | CO4 | An | 5 |
| 24. | Write about N-Immobilization. | | CO3 | U | 5 |
| 25. | Write in detail about merits of vermin-composting. | | CO3 | R | 5 |
| 26. | What is mean by mulching and brief the advantages of mulching? | | CO2 | R | 5 |
| 27. | What is NSKE? How it is prepared? | | CO2 | C | 5 |
| 28. | Define organic farming and list out the benefits of organic farming. | | CO1 | R | 5 |
| 29. | Differentiate between organic and conventional farming. | | CO4 | U | 5 |
| 30. | Brief on organic certification and its importance. | | CO6 | R | 5 |
| 31. | Write a short note on NPOP guidelines. | | CO6 | R | 5 |
| 32. | Write about Indore process composting technique. | | CO3 | R | 5 |
| **PART – C (02 X 15 = 30 MARKS)**  **(Answer any 02 from the following)** | | | | | |
| 33. | a. | What is organic farming? Mention the history of organic farming write the status of organic farming in Tamil Nadu. | CO1 | U | 7.5 |
|  | b. | Discuss about the prospects and problems of organic farming. | CO1 | U | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | What is meant by soil organic matter? Describe the status and improvement strategies of organic carbon in soil. | CO3 | A | 7.5 |
|  | b. | Explain the importance of pest management in organic farming. What are pro and cons of biological pest control in crops? Discuss in detail about various components of pest management in organic farming. | CO2 | An | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Discuss about the non-chemical methods of weed control. | CO2 | U | 7.5 |
|  | b. | Elaborate the principles, concepts and merits of organic agriculture. | CO1 | U | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Remember the concepts of organic farming including its relevance to Indian and global agriculture scenarios |
| CO2 | Understand the crop management practices and technologies for organic crop production. |
| CO3 | Derive insights on soil fertility, nutrient cycle and soil biota. |
| CO4 | Compare the organic crop production with inorganic crop production. |
| CO5 | Apply the knowledge of standards and certification process in organic production. |
| CO6 | Analyze different marketing strategies of organic farm products. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 07 | 22.50 | - | - | 05 | - | 34.50 |
| CO2 | 07 | 14.50 | - | 7.50 | - | 05 | 34.00 |
| CO3 | 13 | 07 | 09.50 | - | - | - | 29.50 |
| CO4 | 01 | 06 | 02 | 05 | - | - | 14.00 |
| CO5 | 02 | - | - | - | - | - | 02.00 |
| CO6 | 10.00 | - | 01 | - | - | - | 11.00 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3218** | **Duration** | **3hrs** |
| **Course Name** | **REMOTE SENSING AND GIS TECHNIQUES FOR SOIL, WATER AND CROP STUDIES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Stefan Boltzmann constant is\_\_\_\_   1. 1.38 8 10-16 erg/k b. 5.6697 \* 10-8 W m-2 k-4   c. 6.626068 \* 10-34 m2 kg/s d. 2898 mm k | | CO1 | R | 1 |
| 2. | The relative brightness or colour of objects in an image is   1. Size b. Shape c. Texture d. Tone | | CO3 | U | 1 |
| 3. | Which of the following is not an open-source GIS software?   1. ILWIS b. QGIS c. ArcGIS d. Jump | | CO4 | A | 1 |
| 4. | Raster data analysis function that requires compulsory two grids is   1. Local b. Focal c. Zonal d. Global | | CO4 | A | 1 |
| 5. | \_\_\_\_ is the vector operation that retrieves desired data from a database   1. Query b. Buffering c. Overlay d. Network analysis | | CO4 | U | 1 |
| 6. | Father of GIS\_\_\_\_ | | CO1 | R | 1 |
| 7. | Active Sensor Example\_\_\_\_\_ | | CO2 | U | 1 |
| 8. | The scattering process when atmospheric particle are essentially equal to the wavelength is\_\_\_\_\_\_\_\_\_\_\_ | | CO1 | U | 1 |
| 9. | ISRO headquarters located at\_\_\_\_ | | CO5 | R | 1 |
| 10. | NDVI stands for\_\_\_\_\_\_\_\_\_\_ | | CO6 | R | 1 |
| 11. | NDVI uses which of the following regions of electromagnetic spectrum   1. Blue band ii. Green band iii. Red band iv. Infra-red band   a. (i),(ii)and(iii) b. (i),(ii)and(iv) c. (iii)and(iv) d. (ii),(iii)and(iv) | | CO6 | E | 1 |
| 12. | Which of the following combination(s) is / are correctly matched?   * + 1. IRNSS – India ii. Beidou – Japan iii. GLONASS – Russia   iv. Galileo – Europe  a. (i),(ii)and(iii) b. (i),(iii)and(iv) c. (i),(ii)and(iv) d. (i),(ii),(iii)and(iv) | | CO5 | R | 1 |
| 13. | Which of the following is correct with non-spatial data?  i. Attribute data ii. Describes spatial data  iii. Contains latitude and longitude information  iv. Contains elevation information  a. i and ii b. i and iii c. i and iv only d. i, ii, iii and iv | | CO4 | A | 1 |
| 14. | Image enhancement improves the image appearance by  i. Contrast stretching ii. Spatial filtering iii. Radiometric corrections  iv. Image transformations  a. i and ii are correct b. i ii and iii are correct  c. i, ii, iii and iv are correct d. Only i is correct | | CO2 | A | 1 |
| 15. | Which of the following statements is / are correct?   * + 1. Rayleigh scattering is one of the primary causes of haze in an imagery     2. Mie scattering occurs when the particle size is just as same size as the wavelength of the radiation     3. Mie scattering causes fog and clouds to appear white     4. Non selective scattering occurs when the particle size much larger than the wavelength of the radiation   a. (i),(ii)and(iii) b. (i),(ii)and(iv) c. (i),(iii)and(iv) d. (i),(ii),(iii)and(iv) | | CO1 | A | 1 |
| 16. | Define Remote Sensing. | | CO1 | R | 1 |
| 17. | Define Sensor. | | CO2 | U | 1 |
| 18. | Define GPS. | | CO5 | U | 1 |
| 19. | List the components of GIS. | | CO4 | U | 1 |
| 20. | Write short note on Non-spatial data. | | CO5 | A | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Brief about the methodology for crop mapping & acreage estimation. | | CO6 | E | 5 |
| 22. | Brief about different database structure. | | CO4 | A | 5 |
| 23. | Brief about electromagnetic spectrum. | | CO1 | U | 5 |
| 24. | Brief about spectral reflectance curves of soil, vegetation and water? With neat graphical presentation. | | CO1 | An | 5 |
| 25. | Write down the classification of sensor. | | CO2 | R | 5 |
| 26. | Visual Image interpretation of satellite imagery aerial photograph. | | CO3 | A | 5 |
| 27. | List the types of cameras and its significance. | | CO3 | U | 5 |
| 28. | What is digital Image processing and its steps involved. | | CO2 | A | 5 |
| 29. | Components of GPS and write its working principle. | | CO5 | A | 5 |
| 30. | Elucidate Geo-statistical technique of evolution of soil variability. | | CO5 | E | 5 |
| 31. | Define soil survey and elaborate its types of soil survey. | | CO6 | R | 5 |
| 32. | Discuss the land degradation mapping process through RS & GIS approaches. | | CO6 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Discuss the interaction of light (energy) with object briefly. | CO1 | An | 8 |
|  | b. | Discuss the Raster data analysis with examples. | CO5 | A | 7 |
| 34. | a. | Elaborate the different errors associated with GPS. | CO5 | R | 8 |
|  | b. | Discuss the yield monitoring in crop using RS approaches. | CO6 | An | 7 |
| 35. | a. | List the applications of RS, GIS & GPS in agriculture. | CO6 | U | 8 |
|  | b. | Discuss the soil mapping process through computer aided interpretation process. | CO5 | E | 7 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the basics of remote sensing. |
| CO2 | Gain knowledge on sensors and image processing. |
| CO3 | Interpret aerial photographs and imageries. |
| CO4 | Learn the principles of GIS and its components. |
| CO5 | Understand the spatial variabilities in soil and geo-statistical techniques. |
| CO6 | Learn the applications of remote sensing and GIS techniques. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 3 | 6 | 1 | 13 |  |  | 23 |
| CO2 | 5 | 2 | 6 |  |  |  | 13 |
| CO3 |  | 6 | 5 |  |  |  | 11 |
| CO4 |  | 1 | 9 |  |  |  | 10 |
| CO5 | 10 | 1 | 13 |  | 12 |  | 36 |
| CO6 | 6 | 13 |  | 7 | 6 |  | 32 |
|  | | | | | | | **125** |



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| **Course Code** | **21AG3226** | **Duration** | **3hrs** |
| **Course Name** | **AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | | | |
| 1. | Who invented the field plot method of experimentation and why? | | CO1 | U | 1 |
| 2. | What does "Law of the Minimum" mean? | | CO1 | U | 1 |
| 3. | What is mean by Subsidy? | | CO4 | A | 1 |
| 4. | Distinguish between NGOs and Voluntary Organizations. | | CO2 | R | 1 |
| 5. | What is mean by Plagiarism? | | CO1 | U | 1 |
| 6. | Expand UNESCO. | | CO2 | R | 1 |
| 7. | What are the eligibility requirements for National Talent Scholarships (NTS)? | | CO3 | An | 1 |
| 8. | Name four current NAAS-rated journals. | | CO6 | R | 1 |
| 9. | What is the PAC expansion? | | CO1 | U | 1 |
| 10. | What is mean by editorial review? | | CO1 | U | 1 |
| 11. | Define community development. | | CO3 | An | 1 |
| 12. | Define Panchayati Raj. | | CO3 | An | 1 |
| 13. | What is New Rices for Africa? | | CO2 | R | 1 |
| 14. | Define research ethics. | | CO1 | U | 1 |
| 15. | Define rural development. | | CO3 | An | 1 |
| 16. | Write about FPO. | | CO3 | An | 1 |
| 17. | Difference between Taluk Panchayat and Zilla Panchayat. | | CO3 | An | 1 |
| 18. | What does Gram Sabha mean? | | CO4 | A | 1 |
| 19. | Define computer ethics. | | CO5 | U | 1 |
| 20. | Expand SGSY. | | CO5 | U | 1 |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | | | |
| 21. | Discuss about roman agriculture. | | CO1 | U | 5 |
| 22. | Why ethical approval is required for human subject’s research? | | CO1 | U | 5 |
| 23. | Give some of the ancient literature that explain about the agriculture. | | CO1 | U | 5 |
| 24. | What types of researches are publishable? | | CO6 | R | 5 |
| 25. | What are the activities of ICAR's Regional Agricultural Research Institutions? | | CO2 | R | 5 |
| 26. | What is democratic decentralization? | | CO4 | A | 5 |
| 27. | Write short notes on Community Development Program. | | CO3 | An | 5 |
| 28. | What do you mean by harm benefit balance in research? | | CO4 | A | 5 |
| 29. | Write short notes 3R’s. | | CO5 | U | 5 |
| 30. | What are all the issues related to Ethical concern in Research. | | CO5 | U | 5 |
| 31. | Outline a general summary of some ethical principles from different codes. | | CO5 | U | 5 |
| 32. | What are the primary causes and types of Plagiarism? | | CO5 | U | 5 |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | | |
| 33. | a. | Write an essay on the historical stages of agricultural development. | CO1 | U | 7.5 |
|  | b. | Write briefly about Consultative Group on international Agricultural Research (CGIAR). | CO2 | R | 7.5 |
|  |  |  |  |  |  |
| 34. | a. | Briefly describe research misconduct and how journal authorities detect and manage research paper misconduct. | CO5 | U | 7.5 |
|  | b. | Describe in detail the various policies and strategies of India's rural development programmes. | CO4 | A | 7.5 |
|  |  |  |  |  |  |
| 35. | a. | Write a detailed note on Sampoorna Grameen Rozgar Yojana. | CO3 | An | 7.5 |
|  | b. | Write in detail about PRIs. | CO6 | R | 7.5 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the research ethics. |
| CO2 | Remember the National and International agencies involved in Agricultural Research. |
| CO3 | Analyse the various Rural Development Programs. |
| CO4 | Apply their knowledge on understanding the policies of Government. |
| CO5 | Transfer their knowledge at International level. |
| CO6 | Attract International collaborations for doing Research. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 28 | - | - | - | - | 28 |
| CO2 | 15.5 | - | - | - | - | - | 15.5 |
| CO3 | - | - | - | 18.5 | - | - | 18.5 |
| CO4 | - | - | 19.5 | - | - | - | 19.5 |
| CO5 | - | 29.5 | - | - | - | - | 29.5 |
| CO6 | 13.5 | - | - | - | - | - | 13.5 |
|  | | | | | | | **125** |