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| **Course Code** | **16CA2017 / 17CA2017** | **Duration** | **3hrs** |
| **Course Name** | **OBJECT ORIENTED ANALYSIS AND DESIGN** | **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. | Compare and contrast object oriented design approach with traditional approaches. | CO1 | An | 10 |
|  | b. | Simulate interfaces with any two real time examples. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Design a class *book* with 5 attributes and three instance methods. Create an object of the *book* class and call the instance methods. | CO1 | C | 10 |
|  | b. | Illustrate the concept of inheritance and polymorphism with appropriate examples. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | Define any ten functional requirements of an address book and analyze their input, functionality, and output. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Sketch level 0, 1, and 2 data flow diagrams for a student result management system. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate the various use case relationships with appropriate examples. | CO3 | A | 10 |
|  | b. | Explain any two sequence diagrams for an ATM. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Illustrate the various approaches of identifying classes using appropriate examples. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 7. |  | Classify the types of object relationships and illustrate each type with an example. | CO4 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Distinguish between aggregation and composition with suitable examples. | CO4 | An | 10 |
|  | b. | Visualize generalization-specialization examples with appropriate class diagrams. | CO4 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Explain the various corollaries defining object-oriented design process. | CO5 | U | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Show the importance of system analysis and design in software development. |
| CO2 | Understand Object Oriented Software Development Process. |
| CO3 | Gain exposure to Object Oriented Methodologies & UML Diagrams. |
| CO4 | Apply Object Oriented Analysis Processes for software projects. |
| CO5 | Construct various UML models. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 20 |  | 10 |  | 10 | 40 |
| CO2 |  |  | 40 |  |  |  | 40 |
| CO3 |  | 10 | 30 |  |  |  | 40 |
| CO4 |  |  | 10 | 30 |  |  | 40 |
| CO5 |  | 20 |  |  |  |  | 20 |
|  |  | 40 | 80 | 40 |  | 10 | **180** |



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| **Course Code** | **16CA2020 / 17CA2020** | **Duration** | **3hrs** |
| **Course Name** | **.NET PROGRAMMING USING C#** | **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. |  | Summarize the advantages of .NET framework. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Construct a program to display a message. | CO1 | A | 8 |
|  | b. | Summarize the history and features of object-oriented programming. | CO2 | U | 12 |
|  |  |  |  |  |  |
| 3. | a. | Summarize the data types in C# programming. | CO1 | U | 15 |
|  | b. | List the rules for declaring a variable. | CO1 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize the operators used in C# Programming. | CO3 | U | 15 |
|  | b. | Compare lvalues and rvalues. | CO3 | U | 5 |
|  |  |  |  |  |  |
| 5. | a. | Construct a program using switch statement. | CO5 | U | 10 |
|  | b. | Describe about arrays in C# programming. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain looping statements with example. | CO4 | A | 10 |
|  | b. | Compare break and continue statements. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. |  | Summarize single and multiple inheritance with suitable example. | CO6 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Construct a program to get the username and password and print the same using class and object. | CO5 | A | 10 |
|  | b. | Describe method overriding with examples. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Create a table named ‘Book’ and with the attributes ‘Name’, ‘Author’, ‘Publisher’, ‘ISBN’. Write a program to insert, delete and display the records. | CO5 | U | 10 |
|  | b. | Summarize the advantages of database management system. | CO5 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the basic programming concepts of .NET framework. |
| CO2 | Understand object-oriented programming concepts of C#. |
| CO3 | Develop standalone applications in C#. |
| CO4 | Evaluate user requirements for software functionality required to decide whether the language meet the requirement. |
| CO5 | Propose the use of .Net Technologies by implementing them in the C# programming language for a given problem. |
| CO6 | Choose an object-oriented approach for solving problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 35 | 8 | - | - | - | 48 |
| CO2 | - | 12 | - | - | - | - | 12 |
| CO3 | - | 30 | - | - | - | - | 30 |
| CO4 | - | - | 20 | - | - | - | 20 |
| CO5 | - | 30 | 10 | - | - | - | 40 |
| CO6 | - | 10 | 20 | - | - | - | 30 |
|  | | | | | | | **180** |



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| **Course Code** | **16EN2004 / 17EN2004** | **Duration** | **3hrs** |
| **Course Name** | **CREATIVE ENGLISH** | **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. | Identify the figures of speech in the following sentences:  (i) The lily is as sweet as the rose  (ii) There is a garden in her face  Where roses and white lilies grow  (iii) Lightning danced across the sky.  (iv) He is running faster than the wind.  (v) Little oaks fell great trees. | CO2 | U | 5 |
|  | b. | “Beauty is something we derive when we have got used to the beast” – Substantiate this statement with reference to R.K.Narayan’s Beauty and the Beast. | CO3 | An | 15 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Compare and contrast the different behaviors of the men in the lift and the bus conductor and discuss the importance of polite manners with reference to A.G. Gardiners “On Saying Please”. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Summarize the blessings bestowed on good people from the *Beatitudes of Jesus Christ.* | CO4 | R | 10 |
|  | b. | State how Portia brings out the importance of the quality of Mercy to Shylock. | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Comment on Mark Antony’s power of persuasion and rhetoric in the funeral oration. | CO4 | An | 20 |
|  |  |  |  |  |  |
| 5. | a. | Discuss the preparatory steps for an interview. | CO6 | R | 10 |
|  | b. | Narrate an unforgettable incident in your life. | CO6 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | You experience a continuous power cut in your area. You wish to bring it to the notice of the Assistant Engineer, Electricity Board. Draft a letter of complaint giving details of the difficulty the families in your colony are facing. | CO6 | U | 10 |
|  | b. | There seems to be an increasing number of serious crimes committed each year. Can death penalty be used as a deterrent? Give your opinion. | CO5 | An | 10 |
|  |  |  |  |  |  |
| 7. |  | Examine the different aspects of Body Language and explain how it enhances communication. | CO6 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Write an essay on the topic “Impact of Social Networking”. | CO5 | An | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Describe the struggles faced by Booker T Washington to get admission into Hampton Institute. | CO3 | R | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Develop cognitive skills. |
| CO2 | Gain vocabulary skills and proper language usage. |
| CO3 | Acquire the skills of skimming- scanning and comprehending literary texts. |
| CO4 | Appreciate and interpret literary masterpieces. |
| CO5 | Develop the art of creative and professional writing. |
| CO6 | Master the skills to speak- interact and respond in a flawless manner. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  |  |  |  | - | - |  |
| CO2 |  | 5 |  |  |  |  | 5 |
| CO3 | 20 | 20 |  | 15 | - | - | 55 |
| CO4 | 10 |  |  | 30 |  |  | 40 |
| CO5 |  |  |  | 30 | - | - | 30 |
| CO6 | 20 | 10 |  | 20 | - | - | 50 |
|  | | | | | | | **180** |



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| **Course Code:** | **16LN2009** | **Duration :** | **3hrs** |
| **Course Name:** | **HINDI-I** | **Max. Marks:** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **CO/ BL** | **Marks** |
|  |  | **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** |  |  |
| 1. | a. | कबीरजी के गुरु का नाम क्या है ? | CO1/U | 2 |
|  | b. | उनका मरण कब हुआ ? | CO1/R | 2 |
|  | c. | उनके परिवार के लोगों का नाम क्या है ? | CO1/ R | 3 |
|  | d. | कबीरजी का परिचय दीजिये ? | CO1/ R | 3 |
|  | e. | पथ्तर की पूजा और दया के बारे में वे क्या बोलते है ? | CO1/ R | 10 |
| **(OR)** | | | | |
| 2. | a. | मन्नूजी का जन्म कब और कहाँ हुआ ? | CO1/U | 2 |
|  | b. | नौकर का कसूर क्या था ? | CO1/R | 2 |
|  | c. | लेखक के बारे में बताईये | | CO1/ R | 3 |
|  | d. | मन्नूजी क्या क्या किताबें लिखे थे ? | CO1/ R | 3 |
|  | e. | सयानी बुआ के सारांश लिखिए | | CO1/ R | 10 |
|  |  |  |  |  |
| 3. | a. | मधुकांत जी का मूल नाम क्या है ? | CO2/U | 2 |
|  | b. | उनकी प्रमुख कृतियाँ – लिखिए | | CO2/R | 2 |
|  | c. | चौधरी बदलूराम का परिचय दीजिये | | CO2/ R | 3 |
|  | d. | सरपंच के नौकर का नाम और उसका काम के बारे में बताईये | | CO2/ R | 3 |
|  | e. | सेठ किरोड़ीमल और गाना सुननेवाला के बारे में लिखिए | | CO2/ R | 10 |
| **(OR)** | | | | |
| 4. | a. | विवेकानंदजी का यह भाषण कहाँ हुआ ? | CO2/U | 2 |
|  | b. | रामकृष्ण परमहंस से वे कब मिले ? | CO2/R | 2 |
|  | c. | उनके किदाबें क्या क्या है ? | CO2/ R | 3 |
|  | d. | स्वामीजी का परिचय दीजिये | | CO2/ R | 3 |
|  | e. | देश के बारे में स्वामीजी की चिंता क्या है ? | CO2/ R | 10 |
|  |  |  |  |  |
| 5. | a. | संत रैदास के बारे में बताईये | | CO3/U | 2 |
|  | b. | वे किस कारण महँ बने ? | CO3/R | 2 |
|  | c. | उनके किताबों के बारे में लिखिए | | CO3/ R | 3 |
|  | d. | श्रम कबहूँ निष्पल न जाय – समझाईये | | CO3/ R | 3 |
|  | e. | रैदास की वाणी – सारांश लिखिए | | CO3/ R | 10 |
| **(OR)** | | | | |
| 6. | a. | महादेवी का जन्म और मरण कब हुआ ? | CO3/U | 2 |
|  | b. | उनकी कवितायेँ किस पर आधारित थी ? | CO3/R | 2 |
|  | c. | उनकी खानदान और उनके पुरस्कार के बारे में लिखिए | | CO3/ R | 3 |
|  | d. | उनके प्रमुख कृतियां क्या है ? | CO3/ R | 3 |
|  | e. | सोना छात्रावास में क्या करती थी और उसकी मृत्यु क्यों हुआ ? | CO3/ R | 10 |
|  |  |  |  |  |
| 7. | a. | कुंवर नारायणजी क्या पढ़े थे ? | CO4/U | 2 |
|  | b. | उनके घर के द्वार पर पेड़ कैसे खड़ा था ? | CO4/R | 2 |
|  | c. | कुंवर नारायणजी के बारे में लिखिये | | CO4/ R | 3 |
|  | d. | वे प्रकृति प्रेमी – ससमझाईये | | CO4/ R | 3 |
|  | e. | वृक्ष की हत्या कविता के सारांश लिखिए | | CO4/ R | 10 |
| **(OR)** | | | | |
| 8. | a. | सूर्यकांत के मरण कब हुआ ? | CO4/U | 2 |
|  | b. | उनकी प्रमुख कृतियाँ क्या है ? | CO4/R | 2 |
|  | c. | कवी का परिचय दीजिये | | CO4/ R | 3 |
|  | d. | पत्थर तोडनेवाली का परिचय दीजिये | | CO4/ R | 3 |
|  | e. | निरालाजी की कविता का सारांश लिखिए | | CO4/ R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | |
| 9. | c | वाक्य के बेद क्या है ? | CO5/R | 2 |
|  | b. | संज्ञा के बेद क्या है ? | CO5/R | 4 |
|  | c. | विशेषण के प्रकार क्या है? | CO5/R | 4 |
|  | d. | अध्यापिका चाहिए – विज्ञापन दीजिये | CO6/U | 5 |
|  | e. | परिदृश्यक प्रकाशन को अपने विद्यालय के पुस्तकालय कुछ पुस्तकें मांगकर पत्र लिखिए | | CO6/U | 5 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | सामान्य हिंदी को समजने की क्षमता |
| CO2 | सामान्य गीतों को उचित से समजने की क्षमता |
| CO3 | हिंदी के हंबिंद हल करने की क्षमता |
| CO4 | हिंदी पड़ने की ,अपनी राय प्रकट करने की क्षमता |
| CO5 | व्याकरण सहित बात करने की क्षमता |
| CO6 | औपचरिक ,अनौपचारिक पत्रों ,फ़ॉर्मों को बरने की क्षमता |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 2 | 18 | - | - | - | - | 20 |
| CO2 | 2 | 18 | - | - | - | - | 20 |
| CO3 | 2 | 18 | - | - | - | - | 20 |
| CO4 | 2 | 18 | - | - | - |  | 20 |
| CO5 | 10 | - | - | - | - | - | 10 |
| CO6 |  | 10 | - | - | - | - | 10 |
|  | | | | | | | **100** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| **Course Code** | **17CA2017** | **Duration** | **3hrs** |
| **Course Name** | **OBJECT ORIENTED ANALYSIS AND DESIGN** | **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. | Explain about the object-oriented concepts in detail. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe about the object-oriented systems development with use case driven approach. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Discuss the Rumbaugh et al's object modeling technique. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe Jacobson et al methodologies. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 5. | a. | Construct a class diagram for student management system and explain the notations of class diagram. | CO4 | C | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Recognize UML dynamic modelling in detail. | CO5 | U | 20 |
|  |  |  |  |  |  |
| 7. | a. | Sketch the use case diagram for ATM transaction. | CO4 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain about identifying object relationships, attributes and methods. | CO6 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Identify the object-oriented design process and design axioms and explain the same. | CO6 | U | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Show the importance of system analysis and design in software development. |
| CO2 | Understand Object Oriented Software Development Process. |
| CO3 | Gain exposure to Object Oriented Methodologies & UML Diagrams. |
| CO4 | Apply Object Oriented Analysis Processes for software projects. |
| CO5 | Construct various UML models. |
| CO6 | Apply object oriented methodologies in developing software projects. |

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



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| **Course Code** | **17CA2055** | **Duration** | **3hrs** |
| **Course Name** | **OSI LAYERS AND SECURITY PROTOCOLS** | **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. | Describe about the HTTP and LDAP protocols in detail. | CO2 | U | 10 |
|  | b. | Discuss about the SMTP protocol. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Explain about the OSI model with respect to user applications and communications technology. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe about the working of MGCP and NNTP protocols. | CO2 | U | 10 |
|  | b. | Discuss about the applications of SIP protocol with suitable diagram. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Write a detailed note on the various protocols which are applied in Banking. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Describe about the following concepts in DCCP protocol.   1. Streaming Media. 2. Connections in DCCP. 3. Features in DCCP. | CO2 | U | 10 |
|  | b. | Discuss about the ECN protocol. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Explain about the following concepts of Internet protocol in detail.  a) IPV4 header.  b) different types of IP addresses.  c) Fragmentation and reassembly.  d) Connection Control. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 7. |  | Discuss about the network layer in detail. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Explain about the various types of data link layer protocols in detail. | CO6 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Demonstrate the ARP and OSPF protocols in detail. | CO6 | U | 20 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Familiar with concept of the OSI model. |
| CO2 | Understand the protocol concepts and its types. |
| CO3 | State transport Layer. |
| CO4 | Compare IPv4 versusIPv6. |
| CO5 | Define Internet Protocol Security, Internet control message protocol & Internet group management protocol. |
| CO6 | Define data link layer and the protocols used. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  | 20 |  |  |  |  | 20 |
| CO2 |  | 60 |  |  |  |  | 60 |
| CO3 |  |  | 20 |  |  |  | 20 |
| CO4 |  | 20 |  |  |  |  | 20 |
| CO5 |  | 20 |  |  |  |  | 20 |
| CO6 |  | 40 |  |  |  |  | 40 |
|  | | | | | | | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| --- | --- | --- | --- |
| **Course Code** | **17CA2055** | **Duration** | **3hrs** |
| **Course Name** | **OSI LAYERS AND SECURITY PROTOCOLS** | **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. | Describe about the working of File Transfer Protocol in detail. | CO2 | U | 10 |
|  | b. | Discuss about the different versions of SNMP protocol and also explain the SNMP protocol concepts with suitable diagram. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain about the different kinds of OSI layer in detail. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe about the BGP Protocol in detail. | CO2 | U | 10 |
|  | b. | Discuss about the implementation of Remote Procedure Call Mechanism in detail. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain about the various security protocol which can be applied in the day-to-day life. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 5. | a. | Describe about the characteristics of SCTP protocol in detail. | CO2 | U | 10 |
|  | b. | Discuss about the RTSP and RSVP Protocols in detail. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain about the following transport layer protocols in networking.   1. Transmission control protocol. 2. User Datagram Protocol. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 7. | a. | Discuss about the different types of network layer protocols in detail. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Demonstrate the Following protocols   1. Neighbour Discovery Protocol (NDP). 2. Tunneling Protocol (Tunnels). 3. Point to Point Protocol (PPP). | CO6 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain about the data link layer in detail. | CO6 | U | 20 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Familiar with concept of the OSI model. |
| CO2 | Understand the protocol concepts and its types. |
| CO3 | State transport Layer. |
| CO4 | Compare IPv4 versusIPv6. |
| CO5 | Define Internet Protocol Security, Internet control message protocol & Internet group management protocol. |
| CO6 | Define data link layer and the protocols used. |

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



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| **Course Code** | **14EN2007 / 17LN2001** | **Duration** | **3hrs** |
| **Course Name** | **FRENCH - I** | **Max. Marks** | **100** |

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| **Q. No.** | | **Sub Div.** | **Questions** | **CO / BL** | **Marks** | |
|  | |  | **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** |  |  | |
| 1. | | a. | Quel âge as-tu ? | CO 1 / R | 1 | |
|  | | b. | Quelle couleur aimes – tu ? | CO 1 / R | 1 | |
|  | | c. | Ecrivez en anglais – la jupe, une fille | CO 1 / R | 2 | |
|  | | d. | Comment tu-t’appelles ? | CO 1 / R | 2 | |
|  | | e. | **Conjuguez les verbes au présent:**  1.Vous\_\_\_\_\_\_\_( manger) des fruits.  2. Mes parents \_\_\_\_\_\_\_\_\_\_( arriver) à la gare à 6 heures.  3. Les artistes \_\_\_\_\_\_\_\_\_\_ (choisir) une pièce intéressant.  4. Je\_\_\_\_\_\_\_\_\_(remplir) la fiche d’identité.  5. Il \_\_\_\_\_\_\_\_\_\_(aller) au café.  6. Il \_\_\_\_\_\_\_\_\_\_(faire) la course.  7. Je \_\_\_\_\_\_\_\_\_\_\_(voir) un film.  8. Tu \_\_\_\_\_\_\_\_\_\_\_(parler) français  9. Je\_\_\_\_\_\_\_\_\_(Prendre)le diner  10. Je \_\_\_\_\_\_\_\_\_(boire) de l’eau.  11. Nous \_\_\_\_\_\_\_\_\_\_(manger) les légumes  12. Les filles \_\_\_\_\_\_(aimer) porter de jolies robes  13.Marinne \_\_\_\_\_\_\_\_\_(jouer) dans le jardin | CO 1 / U | 14 | |
| **(OR)** | | | | | | |
| 2. | | a. | Nous \_\_\_\_\_\_\_\_\_carte d’identité  (nos / notre / ton) | CO 1 / R | 1 | |
|  | | b. | C’est \_\_\_\_\_\_\_ ( le /la /des) mère de Caroline | CO 1 / R | 1 | |
|  | | c. | \_\_\_\_\_\_\_homme est gentil. (cette / ces /cet) | CO 1 / R | 2 | |
|  | | d. | Écrivez les mots “ chien , chat“ en anglais | C 1 / R | 2 | |
|  | | e. | Présentez -vous | CO 1 / U | 14 | |
|  | |  |  |  |  | |
| 3. | | a. | Il fait froid \_\_\_\_\_\_\_\_\_\_\_\_  a) en été b) en hiver c) au printemps | CO 2 / R | 1 | |
|  | | b. | C’est le Rois Soleil  a) Nepean Bonaparte b)Charles de Gaulle c)Louis XIV | CO 2 / R | 1 | |
|  | | c. | Ecrivez en anglais : contente , timide , | CO 2 / R | 2 | |
|  | | d. | Nommez deux fruits | CO 2 / R | 2 | |
|  | | e. | i)Ecrivez les mois de l’année  II)Reliez  1. Lundi - May  2. Dimanche - august  3. Vendredi - Monday  4. Une femme - Sunday  5. Un manteau - Friday  6. Août - A Lady  7. Mai - A coat | CO 2 / U | 14 | |
| **(OR)** | | | | | | |
| 4. | | a. | La tour Eiffel a été construite en 1889. A) Vrai b) faux | CO 2 / R | 1 | |
|  | | b. | Est ce que tu es végétarien ? | CO 2 / R | 1 | |
|  | | c. | Écrivez en anglais : Le poisson , le poulet | CO 2 / R | 2 | |
|  | | d. | Choisissez le verbe  1.Je suis français. Je (viens / habite) à Paris  2. Dorathy \_\_\_\_\_\_\_(a /est) 17 ans. | CO 2 / R | 2 | |
|  | | e. | Conjuguez les verbes au présent : 1. Aller 2 .Être | CO 2 / U | 14 | |
|  | |  |  |  |  | |
| 5. | | a. | Écrivez le mot “ tante “ en français | CO 3 / R | 1 | |
|  | | b. | Écrivez le mot “ petit déjeuner “ en anglais | CO 3 / R | 1 | |
|  | | c. | Nommez deux villes? | CO 3 / R | 2 | |
|  | | d. | Nommez deux fleuves ? | CO 3 / R | 2 | |
|  | | e. | **Lisez et repondez bien:**  Navin: Vous êtes Paris?  Karim: Non, de Toulouse, mais je suis algérien.  Sylvie: Et moi, Je suis mauricienne.  Navin: Qu’est-ce que vous faites?  Karim: Je suis informaticien.  Sylvie: Vous parlez très bien le français!  Vous parlez d’autres langues ?  Navin: Je parle hindi chez moi. Avec les touristes, je parle anglais, français Et aussi allemande, mais un petit peu.  Sylvie: C’est formidable!  Navin: Est-ce que vous êtes marié?  Karim: Non, je suis célibataire.  Sylvie: L’hôtel est loin?  **a. Questions:**  1. Qui est Karim?  2. Quelles langues Sylvie Parle?  3. Est-ce que Karim est marié.?  4. Est-ce que Navin parle hindi?  5. Donnez deux adjectives  **b. Dites vrai ou faux:**  1. Karim est informaticien.  2. Sylvie parle bien le français.  3. Navin parle anglais chez lui.  4. Sylvie est célibataire. | CO 3 / U | 14 | |
| **(OR)** | | | | | | |
| 6. | | a. | Il fait Chaud \_\_\_\_\_\_\_\_  (en été /en hiver /au printemps) | CO 3 / R | 1 | |
|  | | b. | Nommez deux vins | CO 3 / R | 1 | |
|  | | c. | Marianne a reçu le prix noble (vrai /faux) | CO 3 / R | 2 | |
|  | | d. | Quels sont les repas français ? | CO 3 / R | 2 | |
|  | | e. | Traduisez en anglais  Bonjour, moi c'est Alice. J'ai 29 ans et je suis étudiante  en médecine. J'habite à Ramonville dans une grande  maison avec deux amies mais l'année prochaine, je vais travailler Lyon. J'ai deux sœurs et j'aime beaucoup être avec elles. Elles sont adorables. Moi, j'adore cuisiner  mais la cuisine chinoise, c'est un peu difficile !  J'aime faire du sport. Je fais de l'escalade et du ski avec deux amis. | CO 3 / U | 14 | |
|  | |  |  |  |  | |
| 7. | | a. | Nommez deux légumes | CO 4 / R | 1 | |
|  | | b. | As – tu des soeurs ? | CO 4 / R | 1 | |
|  | | c. | Ta mère , Elle s’ appelle comment ? | CO 4 / R | 2 | |
|  | | d. | Le frère de ta mère est ton o......... e | CO 4 / R | 2 | |
|  | | e. | Écrivez le négative : (utilisez ne .......... pas )  1.Vous prenez les livres.  2. Ils voyagent beaucoup.  3.Je finis mon travail.  4. Elle est directrice.  5. Vous montez les valises  6. Il entre dans la cathédrale.  7.Elles rentrent à Rome.  8.Tu viens du stade.  9. Il parle français.  10.Louise tombe sur le trottoir  11. Vous avez 33 ans.  12.Elles vont aux Etas unis  13.le père de Caroline travaille dans une banque.  14.Je finis mon travail. | CO 4 / U | 14 | |
| **(OR)** | | | | | | |
| 8. | | a. | La tour Eiffel a été construite en 1889. A) Vrai b) faux | CO 4 / R | 1 | |
|  | | b. | Aimez – vous le theatre? | CO 4 / R | 1 | |
|  | | c. | Ecrivez en français  aller , manger | CO 4 / R | 2 | |
|  | | d. | Ecrivez Les nombres ( 1- 5) | CO 4 / R | 2 | |
|  | | e. | Ecrivez les saisons  Ecrivez les jours de la semaine | CO 4 / U | 14 | |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | |
| 9. | | a. | C’est un écrivain \_\_\_\_\_\_a)Louis XIV b) Jules verne c)Gustave Eiffel | CO 1 / R | 1 | |
|  | | b. | La capitale de la France est\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | CO 1 / R | 1 | |
|  | | c. | Nommez trois légumes | CO 1 / R | 3 | |
|  | | d. | Ecrivez les adjectifs possessifs  1.\_\_\_\_\_\_\_\_\_\_\_ami est sympa (Ma / Mon /mes)  2. Nicolas, \_\_\_\_\_ sœur est très intelligente. (sa/son/ses)  3. Manuel cherche \_\_\_\_\_ frère.(ton/son/sa)  4. Où sont \_\_\_\_\_ livres? (tes/ton /ta)  5. J'ai perdu \_\_\_\_\_ clés. (mon /ma/mes) | CO 5 / R | 5 | |
|  | | e. | **Lisez la lettre et répondez :**  M.Dubois travaille dans un hôpital. Il est médecin. Il est sympathique. Il aime les enfants. Mme Dubois est actrice. Elle joue bien ses rôles. Elle est belle et gentille. Elle aide les pauvres. Paul, le fils de M.et Mme Dubois est pilote. Il conduit l’avion. Il est beau. Il est souriant. Sa sœur, Christelle est journaliste. Elle travaille dans un agence de journal. Elle voyage beaucoup. Elle est vive et active.  **A. Répondez par une phrase complète.**  1. Quelle est la profession de Mme. Dubois ?  2. Décrivez la sœur de Paul dans une phrase.  3. Ou travaille M.Dubois ?  **B. Dites vrai ou faux**  1.M.Dubois n’aime pas les enfants.  2. Christelle a un frere.  3. Paul est acteur  4. Les Dubois ont deux enfants | CO 6 / U | 10 | |
|  | |  | **CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL |  |  | |
| R | | **COURSE OUTCOMES** | | | | |
| CO1 | | Become familiar with the basics of the language | | | | |
| CO2 | | Acquire a basic knowledge of French culture and its nuances | | | | |
| CO3 | | Use familiar everyday expressions and phrases aimed at the satisfaction of needs of a concrete type | | | | |
| CO4 | | Introduce himself/herself and others and can ask and answer questions about personal details | | | | |
| CO5 | | Interact in a simple way provided the other person talks slowly and clearly and is prepared to help. | | | | |
| CO6 | | Learn the various strategies to overcome the basic difficulties in LSRW | | | | |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 14 | - | - | - | - | 24 |
| CO2 | 6 | 14 | - | - |  |  | 20 |
| CO3 | 6 | 14 | - | - | - | - | 20 |
| CO4 | 6 | 14 | - | - |  |  | 20 |
| CO5 | 2 | - | - | - | - | - | 2 |
| CO6 | - | 14 | - | - | - | - | 14 |
|  | | | | | | | **100** |



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| **Course Code** | **14EN2010 / 17LN2002** | **Duration** | **3hrs** |
| **Course Name** | **FRENCH- II** | **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. | La camembert est \_\_\_\_\_\_\_\_\_\_\_\_\_ (le fromage / le vin) | CO1 | R | 1 |
|  | b. | Ecrivez le mot “ content ‘ | COI | R | 1 |
|  | c.. | Est ce qu’on dit « bonjour » ou «  bonsoir » le matin ? | COI | R | 2 |
|  | d. | Nommez quelques professions des Français ? | COI | R | 2 |
|  | e. | Traduisez en anglais :  Je m'appelle Éric Garnier. , J'habite dans une ferme, près de Toulouse. J'aime beaucoup les animaux, mais à la maison, il y a des animaux extraordinaires ... Par exemple, il y a Télé. C'est le petit chien noir de mon frère, Marc. Il s' appelle Télé parce qu 'il adore la Télévision. Et Il y a aussi Blanco, le petit chat de Maman. Naturellement, il s'appelle Blanco parce qu 'il est blanc. Il déteste la télévision, mais il aime beaucoup la radio et il adore la musique.  Eh bien; Télé aime la télévision, mais Blanco préfère la radio ... voilà, c'est très bien... mais non! Ce n'est pas très bien parce qu'il y a aussi Jules et quelquefois, il y a Néron. Jules est le perroquet de ma Soeur, Claire. Il est petit et très mignon, mais il n' aime pas la télévision, il n’ aime pas la radio et il déteste la musique. | COI | U | 14 |
|  |  | **(OR)** | CO1 | R | 1 |
| 2. | a. | La famille part Pour \_\_\_\_\_\_\_\_\_(Lyon/ Rouen / Nice) | COI | R | 1 |
|  | b. | Ces temples sont \_\_\_\_\_\_\_(grand) (adjectifs) | COI | R | 2 |
|  | c. | Nommez des fruits? | COI | R | 2 |
|  | d. | Ecrivez deux le mois de l’année. | COI | U | 14 |
|  | e. | Conjuguez les verbes au présent : 1. Faire , 2 . Avoir 3.Etre 4. aller |  |  |  |
|  |  |  |  |  |  |
| 3. | a. | Trouvez la verbe “ faites “ | CO2 | R | 1 |
|  | b. | Un repas familial : (a) goûter (b) déjeuner (c) dîner | CO2 | U | 1 |
|  | c. | Nommez des transports? | CO2 | R | 2 |
|  | d. | Ecrivez les noms des légumes. | CO2 | R | 2 |
|  | e. | **Remettez les phrases dans le bon ordre:**   * Oui, donnez-moi aussi deux kilos de pommes de terre. * Voilà l’argent. * Que desirez-vous monsieur? * Vous voulez autre chose? * Merci monsieur. * Combien ça fait? * Je veux un kilo de tomates et deux kilos d’oignons. * Ça fait 20€15. * Voilà monsieur. | CO2 | R | 14 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Il y a plus de \_\_\_\_\_\_\_\_\_\_sortes fromages.  300 / 400 | CO2 | R | 1 |
|  | b. | \_\_\_\_\_\_\_\_\_bicyclette est petite. (Ta /Ton /tes) | CO2 | U | 1 |
|  | c. | Écrivez le mot en anglais.  Partir la plage | CO2 | R | 2 |
|  | d. | Lundi ,Mardi, \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_ | CO2 | R | 2 |
|  | e | **I.Chassez l’intrus (odd one out)**   1. La chambre - le lit – la voiture – le poste de télé 2. La réceptionnistes - réserver -commander -la chambre 3. La réception - l’hôtel - le restaurant – la banque 4. Le carte de crédit – l’ordinateur – le billet de banque – le chèque 5. Le professeur – la réceptionniste -le serveur – le garçon   2**. Complétez avec (quel, quelle, quels, quelles)**  1.A \_\_\_\_\_nom vous avez une réservation ?  2. \_\_\_\_\_\_\_\_\_\_\_\_est le numéro de votre chambre ?  3. De \_\_\_\_\_\_\_\_pays est-ce que vous arrivez ?  4. \_\_\_\_\_\_\_\_\_\_couleur aimes -tu ? | CO2 | R | 14 |
|  |  |  |  |  |  |
| 5. | a. | Ton père, Il s’ appelle Comment ? | CO3 | R | 1 |
|  | b. | Eric habite a \_\_\_\_\_\_\_\_\_\_ | CO3 | R | 1 |
|  | c. | Écrivez le verbe “ être “ au futur ( forme vous ) | CO3 | R | 2 |
|  | d. | As - tu des soeurs? | CO3 | R | 2 |
|  | e. | **Lisez le passage of répondez aux questions suivantes**  L’année dernière,, j’ai visite Paris pour la première fois. Avant mon arrivée. J’ai retenu une chambre a un lit a l’hôtel du Palais Royal.  J’ai visite de belles Cathradale.. J’ai vu la tour Eiffel et les autres monuments. J’ai pris mes repas dans les restaurants français. La France est très célèbre pour ses vins et ses fromages. J’ai acheté beaucoup de sortes de fromages pour ma famille et une bouteille de jus frais pour  Mon père. Les gens parisiens sont très aimables et sympathiques. C’est une belle ville pleine de charme.  **1.Repondez aux questions suivantes.**  1. Pourquoi la France, est-elle célèbre ?  2.Decrivez Paris par une phrase complète  **Dites vrai ou faux**  1. Les gens parisiens sont antipathiques.  2. La France est célèbre pour ses fromages.  3. Paris est une ville morte.  **Trouvez dans le texte**.  1. Un autre mot pour « fameux » \_\_\_\_\_\_\_\_\_\_\_\_\_\_  2. Le contraire de « laide » \_\_\_\_\_\_\_\_\_ avant \_\_\_\_\_\_\_\_\_\_  Départ \_\_\_\_\_\_\_\_\_\_\_  3. Un mot pour « une pièce ou l’on couche «  **Complétez avec un/des mots du texte.**  1. La semaine \_\_\_\_\_\_\_\_\_\_\_J’ai organisé une boum chez moi.  2.Combien de \_\_\_\_\_\_\_\_\_\_de desserts as-tu prépares ?  3.Nous avons nettoyé la maison \_\_\_\_\_\_\_\_\_\_le retour  de nos parents.  4.Donnez-moi une \_\_\_\_\_\_\_\_\_\_\_d’eau minérale. | CO3 | U | 14 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | \_\_\_\_\_\_\_\_\_ symbolise la fière du peuple français. | CO3 | R | 1 |
|  | b. | M. Gustave Eiffel a construit \_\_\_\_\_\_\_\_\_\_\_ | CO3 | R | 1 |
|  | c. | Le Président reside au \_\_\_\_\_\_\_\_\_  (Champs Élysées / palais de l’Elysée) | CO3 | R | 2 |
|  | d. | Qui est le président de la France ? | CO3 | R | 2 |
|  | e. | **Traduisez en anglais**  A l’Hôtel  Réceptionniste : Bonjour monsieur !  Client : Bonjour Madame, J ;ai une réservation  Réceptionniste : Votre nom, s’il vous plait  Client : Je m’appelle David  Réceptionniste : Un moment, s’il vous plait. Voila M.David de Paris. Voici la clé magnétique de votre chambre…Chambre 515 votre carte d’identité, s’il vous plait ?  Client : Voici mon passeport.  Réceptionniste : Merci, monsieur. Bon séjour | CO3 | U | 14 |
|  |  |  |  |  |  |
| 7. | a. | Ecrivez le mot est ‘to know ‘ en français | CO4 | R | 1 |
|  | b. | Ecrivez Le mot est ‘ chambre’ en anglais | CO4 | R | 1 |
|  | c. | Ecrivez deux couleurs | CO4 | U | 2 |
|  | d. | Ecrivez deux mois de l’année | CO4 | U | 2 |
|  | e. | **Écrivez les verbes au futur proche:**   1. Je ( finir ) Mon devoir 2. Nous ( arriver ) à l ‘ école 3. Ils ( faire ) le marché. 4. Je ( payer ) en liquid. 5. Je ( voir ) un serpent. 6. Elle ( vendre ) sa maison   7.Je ( donner ) un pourboire au garçon  8. Nous (telephoner) nos amis  9. Ils \_\_\_\_\_\_\_\_\_(manger) des repas  10. Tu \_\_\_\_\_\_\_\_(visiter) la temple.  **Traduisez en anglais:**  1.Des oeufs 2. Du sucre 3. Du beurre 4. De la confiture  5. Du sel 6. Huile 7. Pomme 8. L’oignons | CO4 | U | 14 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | \_\_\_\_\_\_\_\_\_prenons le vol Air France. (Vous /Nous /Je) | CO4 | R | 1 |
|  | b. | Les gens parisiens sont antipathiques. (vrai / faux) | CO4 | R | 1 |
|  | c. | Quel est ton numéro de téléphone ? | CO4 | U | 2 |
|  | d | Ecrivez les nombres (10 s to 50) | CO4 | U | 2 |
|  | e. | **2) Conjuguez les verbes au présent :**  1.Nous \_\_\_\_\_\_\_\_\_\_(diner) ensemble ce soir ? Tu \_\_\_\_\_\_\_\_(être) libre.  2. Nous \_\_\_\_\_\_(avoir) un nouveau professeur de français. Elle \_\_\_\_\_\_\_\_ (être) très sympa.  3. Vous \_\_\_\_\_\_\_(aimer) le tennis ?alors, Je\_\_\_\_\_\_\_\_\_\_(jouer)  4. Demain, on \_\_\_\_\_\_(aller) au château de Versailles.  Aussi nous \_\_\_\_\_\_\_\_\_\_\_(visiter) les monuments.  5. Et toi, en avril, on \_\_\_\_\_\_\_\_\_(déménager) à Grenoble.  **b) Écrivez au négatif :**  1.Elle est employée.  2. Tu parles anglais  3. Le technicien arrive le soir  4.Vous avez un stylo. | CO4 | U | 14 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | La gomme est \_\_\_\_\_\_\_\_\_\_\_(petit /Petite) | CO1 | R | 1 |
|  | b. | Il y a \_\_\_\_\_\_\_\_\_station de métro ( un /une /des) | CO1 | R | 1 |
|  | c. | Ecrivez les participé passe  Prendre , faire | CO2 | R | 2 |
|  | d. | \_\_\_\_\_\_\_\_\_\_\_etait la premiere president  Charles Gaulle / Napoléon Bonaparte | CO5 | R | 2 |
|  | e. | 2) **Reliez les colones**  1. bruit - to speak  2. Prendre - sorry  3. Parler - noise  4. Une femme - to take  5. noir - May  6. Desole - A Lady  7. Mai - pepper  8. Du poivre - black  9. L’avion - Ticket  10. Billet - Aeroplane | CO6 | U | 14 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. |
| CO2 | Understand the French culture and its nuances. |
| CO3 | Interact in a simple way provided the other person talks slowly and clearly and is prepared to help. |
| CO4 | Learn the basic expressions of French and handle them confidently. |
| CO5 | Learn the various strategies to overcome the basic difficulties in LSRW. |
| CO6 | Become familiar with the strategies of handling language contexts. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 10 | 14 |  |  |  |  | 24 |
| CO2 | 6 | 14 |  |  |  |  | 20 |
| CO3 | 6 | 14 |  |  |  |  | 20 |
| CO4 | 6 | 14 |  |  |  |  | 20 |
| CO5 | 2 | - |  |  |  |  | 2 |
| CO6 | - | 14 |  |  |  |  | 14 |
|  | | | | | | | **100** |



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| **Course Code** | **17LN2005** | **Duration** | **3hrs** |
| **Course Name** | **TAMIL - I** | **Max. Marks** | **100** |

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| **Q. No.** |  | | | **Questions** | **CO** | **BL** | **Marks** |
| 1. | m. | | | rpWfij kd;dd; ---------------- | CO3 | U | 1 |
|  | M. | | | jkpo; rpWfijapd; Kd;Ndhb -------------- | CO3 | U | 1 |
|  | ,. | | | rpWfijapd; mbg;gil Nehf;fk; ahJ? | CO3 | R | 2 |
|  | <. | | | Neuir Fwpg;G jUf. | CO1 | R | 2 |
| c. | m. | | | rpWfij – ehty; NtWghL jUf. | CO3 | R | 5 |
|  | M. | | | jkpopy; rpWfij tsh;r;rp gw;wp fl;Liu vOJf. | CO3 | R | 9 |
|  | |  | **(OR)** | |  |  |  |
| 2. | m. | | | kplW vd;gjd; nghUs; ------------------- | CO1 | U | 1 |
|  | M. | | | nky;ypd vOj;Jf;fs; MWk; -------------- ,Ue;J gpwf;fpd;wd. | CO1 | U | 1 |
|  | ,. | | | vOj;Jf;fspd; ,lg;gpwg;G gw;wp vOJf. | CO1 | R | 2 |
|  | <. | | | ntz;gh vj;jid tifg;gLk;? mit ahit? | CO1 | R | 2 |
| c. | m. | | | Fw;wpaypfuk; Fwpg;G jUf. | CO1 | R | 5 |
|  | M. | | | vl;Lj;njhif E}y;fspy; Gwk; rhh;e;j E}y;fs; gw;wp vOJf. 1. gjpw;Wg;gj;J 2. GwehD}W | CO5 | R | 9 |
|  | |  |  | |  |  |  |
| 3. | m. | | | Njk;ghtzpapd; Mrphpah; ------------------ | CO5 | U | 1 |
|  | M. | | | nfhd;];lhd; vd;gjd; nghUs; ----------------- | CO5 | U | 1 |
|  | ,. | | | vl;Lj;njhif E}y;fSk; mtw;wpd; ghFghLfSk; vOJf. | CO5 | R | 2 |
|  | <. | | | neLey;thil Fwpg;G jUf. | CO5 | R | 2 |
| c. | m. | | | mfehD}W - Fwpg;G jUf. | CO5 | R | 5 |
|  | M. | | | gj;Jg;ghl;by; mfk; rhh;e;j E}y;fis vOJf. 1. Ky;iyg;ghl;L 2. gl;bdg;ghiy. | CO5 | R | 9 |
|  |  | | | **(OR)** |  |  |  |
| 4. | m. | | | Njk;ghtzp --------------- ngUk; gphpTfis nfhz;lJ. | CO5 | U | 1 |
|  | M. | | | tPukhKdpth; jpUf;Fwis --------------- nkhopapy; nkhopngah;j;jhh;. | CO5 | U | 1 |
|  | ,. | | | ftpij xU ,yf;fpak; - Fwpg;G jUf. | CO5 | R | 2 |
|  | <. | | | rPfd;ghy;F Iah; Fwpg;G jUf. | CO5 | R | 2 |
| c. | m. | | | Iq;FWE}W – Fwpg;G jUf. | CO5 | R | 5 |
|  | M. | | | 20-Mk; E}w;whz;bd; ,izaw;w Gyth;fs; 1. ghujpjhrd; 2. ghujpahh; gw;wp vOJf. | CO5 | R | 9 |
|  |  | | |  |  |  |  |
| 5. | m. | | | vOj;Jf;fs; gpwg;gjw;F mbg;gil fhuzkhf ,Ug;git --------- | CO1 | U | 1 |
|  | M. | | | jkpopy; vOjg;gl;l Kjy; mfuhjp -------------------- | CO5 | U | 1 |
|  | ,. | | | ,aw;wkpo; - Fwpg;G jUf. | CO5 | R | 2 |
|  | <. | | | nka; - ngah;f;fhuzk; jUf. | CO1 | R | 2 |
| c. | m. | | | rq;ffhyr; rpwg;G gw;wp Fwpg;G jUf. | CO5 | R | 5 |
|  | M. | | | jkpo;ehl;Lf; fpwpj;jth;fs; 1. Ntjehafk; gps;is 2. Ntjehafk; rh];jphpahh; gw;wp vOJf. | CO5 | R | 9 |
|  |  | | | **(OR)** |  |  |  |
| 6. | m. | | | ntz;ghtpd; kw;nwhU ngah; ----------------- | CO1 | U | 1 |
|  | M. | | | ahg;G vd;gjd; nghUs; ------------------ | CO1 | U | 1 |
|  | ,. | | | Njk;ghtzp E}y; tpsf;fk; jUf. | CO5 | R | 2 |
|  | <. | | | gh vj;jid tifg;gLk;? mit ahit? mtw;wpd; Xiria vOJf. | CO1 | R | 2 |
| c. | m. | | | rpWfijapd; Njhw;wk; gw;wp vOJf. | CO3 | R | 5 |
|  | M. | | | Nehpir ntz;gh - ,d;dpir ntz;gh NtWghL jUf. | CO1 | R | 9 |
|  |  | | |  |  |  |  |
| 7.. | m. | | | Njrpaf;ftpQh; vd;W miof;fg;gl;lth; ---------------------- | CO5 | U | 1 |
|  | M. | | | neLe;njhif vd miof;;fg;gLk; E}y; ------------- | CO5 | U | 1 |
|  | ,. | | | ntz;ghtpd; ,dq;fs; vj;jid tifg;gLk;? mit ahit? | CO1 | R | 2 |
|  | <. | | | FWe;njhif Fwpg;G jUf. | CO5 | R | 2 |
| c. | m. | | | rpWfij – ehty; tpsf;fk; jUf. | CO3 | R | 5 |
|  | M. | | | nganur;rk; - tpidnar;rk; tpsf;Ff. | CO1 | R | 9 |
|  |  | | | **(OR)** |  |  |  |
| 8. | m. | | | ehty;fs; nghONghf;fpw;F my;y vd;w epiyia khw;wpath; --------- | CO6 | R | 1 |
|  | M. | | | rKjha ehty;fis rpwg;ghf vOJtjpy; ty;yth; ------------------- | CO6 | R | 1 |
|  | ,. | | | vr;.V.fpUl;bzg;gps;is – Fwpg;G jUf. | CO5 | R | 2 |
|  | <. | | | %tplk; - tpsf;Ff. | CO1 | R | 2 |
| c. | m. | | | Nghyp vOj;Jf;fs; vd;why; vd;d? vj;jid tifg;gLk;? tpsf;Ff. | CO1 | R | 5 |
|  | M. | | | njhifepiyj;njhlh;fs; tpsf;Ff. | CO1 | R | 9 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | | |
| 9. | m. | | | Kjy; tuyhw;Wg; Gjpdk; ------------------ | CO6 | U | 1 |
|  | M. | | | jkpopy; Njhd;wpa Kjy; ehty; ---------------- | CO6 | U | 1 |
|  | ,. | | | gFgjk; tpsf;Ff. | CO1 | R | 2 |
|  | <. | | | gFgj cWg;Gfs; ahit? | CO1 | R | 2 |
| c. | m. | | | ty;ypdk; kpfh ,lq;fis vLj;Jf;fhl;Lld; tpsf;Ff. | CO1 | R | 5 |
|  | M. | | | ehtypd; tiffis tpsf;Ff. | CO6 | R | 9 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | **khzth;fs; r%f khw;wr; rpe;jidfis mwpe;Jnfhs;th;.** |
| CO2 | **khzth;fs; Gjpdj;ijf; fw;gjd; %yk; rKjhar; rpf;fy;fis czh;e;J mtw;wpw;Fj; jPh;Tfhz;gh;.** |
| CO3 | **ehlfq;fis r%fg; gad;ghl;bw;F Vw;g cUthf;Fk; jpwd; ngWth;.** |
| CO4 | **jkpo;f; fhg;gpaq;fspy; moFk; mwpTzh;Tk; Cl;Lk; gFjpfisg; gbj;Jg; Ghpe;J nfhs;th;.** |
| CO5 | **gz;ila ,yf;fpa gjpTfspy; cs;s goe;jkpohpd; MSikfisAk; milahsq;fisAk; mwpe;J nfhs;th;.** |
| CO6 | **Gjpdk; topj; jw;fhy rpf;fy;fisAk; mjw;fhd jPh;TfisAk; cUthf;Fk; jpwd; ngWth;.** |

|  |  |  |  |  |  |  |  |
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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 60 | 5 | - | - | - | - | 65 |
| CO2 | - | - | - | - | - | - | - |
| CO3 | 26 | 2 | - | - | - | - | 28 |
| CO4 | - | - | - | - | - | - | - |
| CO5 | 67 | 7 | - | - | - | - | 74 |
| CO6 | 11 | 2 | - | - | - | - | 13 |
|  | **164** | **16** | **-** | **-** | **-** | **-** | **180** |



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| **Course Code** | **17LN2006** | **Duration** | **3hrs** |
| **Course Name** | **TAMIL - II** | **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. | அ. | “தூய காற்றும் நன்னீரும் ---------------------------------------- உணவும்” | CO2 | U | 1 |
|  | ஆ. | வ. வே. சு. ஐயர் பற்றிய தகவல்கள் இரண்டைக் கூறுக. | CO2 | R | 2 |
|  | இ. | திருவருட்பா தெய்வமணி மாலையில் இடம் பெற்றுள்ள முருகனின் திருக்கோயில் எது? | CO4 | R | 2 |
|  | ஈ. | வெ. இறையன்புவின் கட்டுரையின் சாரத்தை விவரி | CO5 | R | 10 |
|  | உ. | கிணற்றில் கிடைக்கும் பொருட்களாகக் கூறப்படுபவை எவை? | CO1 | U | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | அ. | புத்தகங்கள் பற்றி பாரதிதாசன் குறிப்பிடுவதைக் கூறுக. | CO2 | R | 7 |
|  | ஆ. | தெய்வமணிமாலைய பாடலின் பொருளை விளக்குக. | CO3 | R | 7 |
|  | இ. | உடல் நலம் பேணல் – ஆசிரியர் யார்? | CO4 | R | 1 |
|  | ஈ. | மனித சக்தியின் மகத்துவத்தை விவரி. | CO1 | R | 5 |
|  |  |  |  |  |  |
| 3. | அ. | நா. முத்துக்குமார் தேசிய விருது பெற்ற படம் எது? | CO5 | R | 1 |
|  | ஆ. | வள்ளலாரின் கொள்கைகளைக் கூறுக. | CO4 | R | 7 |
|  | இ. | சிறுகதை என்றால் என்ன ? விளக்குக. | CO6 | R | 5 |
|  | ஈ. | சிறுகதைக்குரிய இலக்கணமாகக் கூறப்படுவதை விவரி. | CO6 | U | 7 |
|  |  | **(OR)** |  |  |  |
| 4. | அ. | பெண்ணியச் சிறுகதைகள் பற்றிய இரு கருத்துக்களை எழுதுக. | CO3 | R | 2 |
|  | ஆ. | கண்ணன் என் விளையாட்டுப் பிள்ளை- கவிதை விளக்குக. | CO1 | R | 7 |
|  | இ. | பாரதியின் இளமைப் பருவம் பற்றிக் கூறுக. | CO3 | R | 5 |
|  | ஈ. | சிறுகதையின் மன்னன் --------------------- ஆவார். | CO3 | U | 1 |
|  | உ. | வளள்லாரின் சத்திய தர்ம சாலை பற்றி விவரி. | CO4 | R | 5 |
|  |  |  |  |  |  |
| 5. | அ. | திருவருட்பா ------------------- திருமுறைகளை உடையது.  தெய்வமணிமாலை ----------------- கடவுளைப் பற்றிக் கூறுகிறது? | CO4 | R | 2 |
|  | ஆ. | தூர் கவிதையில் இடம் பெற்றுள்ள சமூகக் கருத்து யாது ? | CO1 | R | 2 |
|  | இ. | அயல் நாட்டவர் எழுதிய சிறுகதைகளைக் கூறுக? | CO6 | R | 5 |
|  | ஈ. | மகாகவிக்கு பாரதி என்ற பட்டத்தை வழங்கியது யார்? | CO1 | R | 3 |
|  | உ. | பாரத நாடு கவிதையை விவரி. | CO1 | U | 8 |
|  |  | **(OR)** |  |  |  |
| 6. | அ. | கவிமணியின் உடல் நலம் பேணல் கவிதையின் சாரத்தைப் பற்றி விளக்குக | CO1 | R | 7 |
|  | ஆ. | வள்ளலார் ஒரு---------------------- ஆவார் | CO2 | U | 1 |
|  | இ. | சுதந்திர தாகம் கவிதையின் பொருளைக் கூறுக. | CO2 | R | 5 |
|  | ஈ. | முருகப் பெருமானின் பெயர்கள் இரண்டினைக் கூறுக | CO4 | U | 2 |
|  | உ. | குறிப்பு வரைக. 1. மாதவையர்  2. புதுமைப்பித்தன் | CO3 | R | 5 |
|  |  |  |  |  |  |
| 7. | அ. | இறையன்பு பெற்ற விருதுகள் இரண்டைக் கூறுக. | CO2 | R | 2 |
|  | ஆ. | வ. வே. சு. ஐயர் முதன் முதலில் எழுதிய சிறுகதை எது ? | CO3 | R | 2 |
|  | இ. | சபையில் திரௌபதி நீதி கேட்டழுதல் பற்றி விவரி. | CO2 | R | 10 |
|  | ஈ. | சுதந்திர தாகம் கவிதையின் சாரம் பற்றிக் கூறுக. | CO1 | U | 6 |
|  |  | **(OR)** |  |  |  |
| 8. | அ. | கவிமணியின் பிரபலமான குழந்தைப் பாடல் எது ? | CO1 | R | 2 |
|  | ஆ. | சிறுகதையின் பிரிவுகள் மூன்றைக் விளக்குக | CO2 | R | 9 |
|  | இ. | திருவருட்பா குறிப்பு வரைக விளக்குக | CO1 | U | 5 |
|  | ஈ. | ஒரு பகுதியின் பிரச்சனைகளை, சூழலை ரத்தமும், சதையுமாக நமக்குத் தருபவை -------------- சிறுகதை ஆகும். | CO2 | R | 1 |
|  | உ. | நா. முத்துக்குமார் பாடல்கள் இடம் பெற்ற படங்கள் மூன்றைக் குறிப்பிடுக. | CO3 | R | 3 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | அ. | 1. பாரதியார் – பரமார்த்த குருவின் கதை 2. கல்கி – திருவருட்பா 3. நாமார்க்கும் குடியல்லோம்- பொன்னியின் செல்வன். 4. வள்ளலார் - கண்ணன் விளையாட்டுப் பிள்ளை 5. அழகியல் சிறுகதை - உத்தமர் தம் உறவு வேண்டும் 6. வீரமாமுனிவர் - கலையை ரசிக்கும் படி அமைவது 7. ஒருமையுடன் நின் திருமலரடி – வெ. இறையன்பு | CO3 | R | 7 |
|  | ஆ. | தூர் கவிதையை விளக்கி அதில் வெளிப்படுத்தியுள்ள சமூகக் கருத்தைக் கூறுக. | CO2 | R | 7 |
|  | இ. | பாரதியார் ஆசிரியர் குறிப்பு வரைக. | CO2 | R | 5 |
|  | ஈ. | பிசிராந்தையார் என்ற நாடக நூலுக்காகப் பாரதிதாசனுக்கு  ---------- விருது கிடைத்தது*.* | CO3 | U | 1 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | மாணவர்கள் சமூக மாற்றச் சிந்தனைகளை அறிந்து கொள்வர். |
| CO2 | மாணவர்கள் கவிதை, சிறுகதை, புதினத்தைக் கற்பதன் மூலம் சமுதாயச் சிக்கல்களை உணர்ந்து அவற்றிற்குத் தீர்வு காண்பர். |
| CO3 | நாடகங்களை சமூகப் பயன்பாட்டிற்கு ஏற்ப உருவாக்கும் திறன் பெறுவர். |
| CO4 | தமிழ்க் காப்பியங்களில் அழகும் அறிவுணர்வும் ஊட்டும் பகுதிகளைப் படித்துப் புரிந்து கொள்வர். |
| CO5 | பண்டைய இலக்கிய பதிவுகளில் உள்ள பழந்தமிழரின் ஆளுமைகளையும் அடையாளங்களையும் அறிந்து கொள்வர். |
| CO6 | புதினம் வழித் தற்கால சிக்கல்களையும் அதற்கான தீர்வுகளையும் உருவாக்கும் திறன் பெறுவர் |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  |  |  |  |  |  |  |
| CO2 |  |  |  |  |  |  |  |
| CO3 |  |  |  |  |  |  |  |
| CO4 |  |  |  |  |  |  |  |
| CO5 |  |  |  |  |  |  |  |
| CO6 |  |  |  |  |  |  |  |
|  | | | | | | | **180** |



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| **Course Code** | **18CA2001** | **Duration** | **3hrs** |
| **Course Name** | **BIG DATA ANALYTICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **COs** | **BL** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the different types of data. | CO1 | U | 10 |
|  | b. | Describe the Data warehouse environment. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | List out the top challenges faced in big data. | CO1 | R | 10 |
|  | b. | Explain the HDFS processing in hadoop. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Write the syntax of following operations in MongoDB:   1. **C**reate 2. **I**nsert 3. **U**pdate 4. **D**elete 5. **F**etch | CO4 | U | 10 |
|  | b. | Distinguish between SQL and NoSQL. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the architecture of a Hive with a neat sketch. | CO3 | U | 10 |
|  | b. | Discuss the Hive commands. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the YARN architecture with neat block diagram. | CO2 | U | 10 |
|  | b. | Describe the file format of hive. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain about the implementation of map reduce concept with a small example. | CO6 | U | 10 |
|  | b. | Explain HDFS Deamons. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain any five Hive commands with example. | CO3 | U | 10 |
|  | b. | Explain sorting used in mapreduce. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain searching used in mapreduce. | CO6 | U | 10 |
|  | b. | Describe Neural Network machine learning algorithm with example. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain decision tree algorithm with example. | CO5 | U | 10 |
|  | b. | Explain the following MongoDB operations.The syntax of the limit () and sort() method.dropping a database.**Aggregation in MongoDB.** | CO4 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the fundamentals of Big data. |
| CO2 | Understand the concept of Hadoop. |
| CO3 | Develop solutions to problem using Big data. |
| CO4 | Gain knowledge about MongoDB. |
| CO5 | Apply big data to solve real word problems. |
| CO6 | Illustrate the role of map reduce programming in various scenarios. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 20 |  | - | - | - | 30 |
| CO2 | - | 40 |  | - | - | - | 40 |
| CO3 | - | 30 |  | - | - | - | 30 |
| CO4 | - | 20 | - | - | - | - | 20 |
| CO5 | - | 30 |  | - | - | - | 30 |
| CO6 | - | 30 |  | - | - | - | 30 |
|  | | | | | | | **180** |



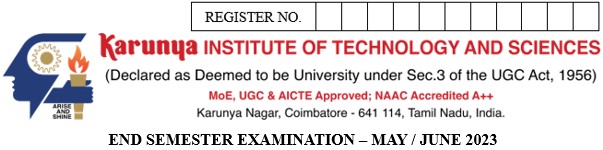
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| **Course Code** | **18CA2011** | **Duration** | **3hrs** |
| **Course Name** | **SOFTWARE PROJECT MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Elaborate the stepwise overview of project planning. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Enumerate the Cost Benefit Evaluation techniques in Software Project Management through suitable examples. | CO1 | R | 20 |
|  |  |  |  |  |  |
| 3. |  | Analyze the need for Software Prototyping. List out the advantages and disadvantages of Software Prototyping. | CO2 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Explain in detail the different Software Effort Estimation techniques through suitable example. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5. | a. | List the steps for formulating a network model. | CO6 | U | 10 |
|  | b. | Analyze the factors that will be considered in allocating activities to individuals. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Find the Critical Chain Path by completing the Network Model. | CO6 | E | 20 |
|  |  |  |  |  |  |
| 7. | a. | Categorize the resources required for a software project. | CO5 | U | 10 |
|  | b. | Justify the need for change control in Software Project Management. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Describe the different types of contracts through suitable examples. | CO4 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | List the steps involved in recruitment process. | CO3 | A | 10 |
|  | b. | Discuss the contents of a project plan. | CO5 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | The overview of project planning. |
| CO2 | Effort estimation and risk management in software projects. |
| CO3 | How to manage people and organize team. |
| CO4 | Learn about planning and execution of the project. |
| CO5 | How to manage a software project in a business environment. |
| CO6 | Learn about project monitoring and control. |

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



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| **Course Code** | **19CA3002** | **Duration** | **3hrs** |
| **Course Name** | **MACHINE LEARNING FOR IMAGE PROCESSING** | **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 the components of machine learning. | CO1 | U | 10 |
|  | b. | Differentiate unsupervised and descriptive learning through suitable example. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Recall the applications of decision trees in classification | CO1 | R | 20 |
|  |  |  |  |  |  |
| 3. | a. | Identify the role of clustering in machine learning. | CO2 | R | 10 |
|  | b. | Explain any two rule-based models in machine learning. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Identify how perceptron’s and support vector machines are used in classification. | CO2 | R | 20 |
|  |  |  |  |  |  |
| 5. | a. | Explain the probabilistic models used for modeling categorical data. | CO3 | U | 10 |
|  | b. | Discuss in detail about compression-based models. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Differentiate the concepts of lossless and lossy compression through suitable example. | CO4 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Explain how an image is viewed and processed by the computer. | CO4 | R | 10 |
|  | b. | Explain the process of getting the image resolution. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Analyze the steps involved in smoothing an image using different filters in Open CV. | CO5 | An | 20 |
|  |  | **PART – B (1 X 20 = 20 MARKS) COMPULSORY QUESTION** |  |  |  |
| 9. |  | Compare the various machine learning approaches in image classification. | CO6 | An | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Recall the concepts used in machine learning. |
| CO2 | Identify the problems that can be solved using machine learning techniques. |
| CO3 | Identify the appropriate algorithms for solving problems. |
| CO4 | Explore the fundamentals of images and their processing. |
| CO5 | Apply machine learning techniques for problem solving. |
| CO6 | Apply machine learning for processing images. |

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



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| **Course Code** | **20CA2002** | **Duration** | **3hrs** |
| **Course Name** | **PROBLEM SOLVING USING PROGRAMMING** | **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. | Summarize the generation of computers. | CO1 | U | 8 |
|  | b. | List the steps involved in the software development life cycle and its functionality. | CO1 | R | 12 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Illustrate the basic data types in C and the rules for declaring a variable. | CO2 | U | 10 |
|  | b. | Summarize the structure of a C program with various sections. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Summarize the storage classes in C with suitable example. | CO2 | U | 12 |
|  | b. | Construct a C program to read an integer, a floating-point value, a double value and print the values along with their sizes. | CO2 | A | 8 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain different types of operators with example. | CO2 | U | 15 |
|  | b. | Construct a program to read the name and mark for five courses and print the same using input-output statements. | CO2 | A | 5 |
|  |  |  |  |  |  |
| 5. | a. | Compare break and continue statements with example. | CO3 | U | 10 |
|  | b. | Construct a program to prompt users to enter a car’s speed; then calculate fines according to the following categories; and display a proper message   |  |  | | --- | --- | | **Speed Limit** | **Fine Rate (₹)** | | <80 | 0 | | 81 to 99 | 200 | | 100 to 109 | 350 | | >109 | 500 | | CO3 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain looping statements with example. | CO3 | U | 15 |
|  | b. | Construct a program to demonstrate the usage of unconditional statement. | CO3 | A | 5 |
|  |  |  |  |  |  |
| 7. | a. | Summarize the advantage of using function and its types with suitable example. | CO4 | U | 10 |
|  | b. | Explain various string operations in C with example | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain arrays and write a program to pass arrays to functions. | CO5 | U | 10 |
|  | b. | Construct a program to swap two numbers using call by reference. | CO4 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Compare structure and union with example. | CO6 | U | 10 |
|  | b. | Explain about file handling concepts with examples. | CO6 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Illustrate the basics of computers and programming language. |
| CO2 | Summarize about character sets and data types. |
| CO3 | Apply control structures in programming. |
| CO4 | Develop C programs to solve computational problems using functions. |
| CO5 | Construct C programs using arrays and strings. |
| CO6 | Develop C programs for solving problems using structures and union. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 12 | 18 | - | - | - | - | 30 |
| CO2 | - | 37 | 13 | - | - | - | 50 |
| CO3 | - | 25 | 15 | - | - | - | 40 |
| CO4 | - | 10 | 10 | - | - | - | 20 |
| CO5 | - | 20 | - | - | - | - | 20 |
| CO6 | - | 16 | 4 | - | - | - | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2004** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF INFORMATION TECHNOLOGY** | **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. | Recall the steps involved in data processing. | CO1 | R | 10 |
|  | b. | Discuss in detail about desktop computer and its components. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze the concept of image compression in detail and tabulate the storage formats for pictures. | CO1 | A | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe MPEG compression standard. | CO2 | U | 10 |
|  | b. | Compare the physical devices used as storage cells | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Illustrate the Concept of networking and its applications in detail. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Recall the concept of Database Management System with examples. | CO4 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Write in detail about Desktop Publishing (DTP). | CO5 | A | 20 |
|  |  |  |  |  |  |
| 7. |  | Explain the importance and applications of internet in detail. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Analyze why the concept of Intellectual Property Rights (IPR) is crucial in the field of Information Technology. | CO6 | A | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Discuss about the benefits and drawbacks of e-commerce. | CO6 | U | 20 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the different types of data. |
| CO2 | Understand data storage in the computer. |
| CO3 | Develop knowledge about the CPU, networks and output devices. |
| CO4 | Understand the database concepts. |
| CO5 | Acquire knowledge about data processing and the Internet. |
| CO6 | Learn about applying IT techniques for societal impact. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 10 |  | 20 |  |  | 40 |
| CO2 |  | 10 |  | 10 |  |  | 20 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 | 20 |  |  |  |  |  | 20 |
| CO5 |  | 20 | 20 |  |  |  | 40 |
| CO6 |  | 20 |  | 20 |  |  | 40 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2006** | **Duration** | **3hrs** |
| **Course Name** | **FOUNDATION OF DATA SCIENCE AND ANALYTICS** | **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. | Explain any three levels of data with example. | CO1 | U | 15 |
|  | b. | List the basic areas of data science. | CO1 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Compare organized and unorganized data. List the steps involved in text data preprocessing. | CO1 | U | 10 |
|  | b. | Explain discrete and continuous data. Explain the essential steps to perform data science. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain how data preprocessing is done using pandas library. | CO2 | A | 10 |
|  | b. | List the basic questions for data exploration. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | |  |  |  |  | | --- | --- | --- | --- | | **Emp ID** | **Emp Name** | **Salary** | **Start Date** | | 1 | Latha | 5000 | 01-11-2012 | | 2 | Mercy | 7500 | 05-06-2011 | | 3 | Lenin | 10000 | 21-09-2000 | | 4 | Kumar | 9500 | 13-09-2013 | | 5 | Kevin | 4500 | 13-09-2001 |   Construct the python code for the above table   1. Create the data frame. 2. Display the maximum salary. 3. Display the sum of the salary. 4. Display the records in the dataset. 5. Display the first 10 rows of the dataframe. 6. Display the columns in the dataframe. | CO2 | A | 12 |
|  | b. | Explain the following with examples   1. Measures of Center 2. Measures of Variation 3. Coefficient of Variation | CO3 | U | 8 |
|  |  |  |  |  |  |
| 5. | a. | Summarize discrete and continuous random variable. | CO3 | U | 10 |
|  | b. | Explain the types of charts used in communicating data. | CO4 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Summarize binary classifier and list the components of a confusion matrix. | CO5 | U | 10 |
|  | b. | Compare correlation and causation. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain any three-performance metrics used in classification machine learning model. | CO5 | U | 10 |
|  | b. | Describe overfitting and underfitting. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain data cleaning and discuss the methods used to handle missing and inconsistences in the dataset. | CO6 | U | 10 |
|  | b. | Describe about text sentiment analysis with an example program. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Summarize decision tree classification with example. | CO5 | U | 12 |
|  | b. | Explain unsupervised machine learning model and the working of K-means algorithm. | CO5 | U | 8 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | summarize the basics of data science. |
| CO2 | categorize data and process them. |
| CO3 | identify the mathematical foundations of data science. |
| CO4 | inspect the role of probability and statistics in data analytics. |
| CO5 | formulate the fundamentals of machine learning techniques in data exploration. |
| CO6 | apply data analytics to real world problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 5 | 35 | - | - | - | - | 40 |
| CO2 | 10 | - | 22 | - | - | - | 32 |
| CO3 | - | 18 | - | - | - | - | 18 |
| CO4 | - | 20 | 10 | - | - | - | 30 |
| CO5 | - | 40 | - | - | - | - | 40 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA2008** | **Duration** | **3hrs** |
| **Course Name** | **ESSENTIALS OF PYTHON PROGRAMMING** | **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. |  | i. Read two strings as input from the user.  ii. Concatenate the two strings and print the concatenated string.  iii. Write the code to count the number of characters in the first string.  iv. Consider sample=’green meadows’. Write the code to extract ‘meadows’ from ‘sample’ and print it on the screen.  v. Write the code to print ‘\*’ 20 times using ‘repeat string’ operator.  vi. Write the code to display the individual words from the following string: ‘A stitch in time saves nine’.  vii. Consider the string ‘The sun sets in the west every evening’. Change it to ‘The sun rises in the east every morning’ by replacing the corresponding words using string functions.  viii. Read a string as input from the user. Write the code to change its case and print it. (If the input is in lowercase, the output should be in uppercase and vice versa).  ix. Write the code to count the number of spaces in a sentence.  x. Write the code to print the position of ‘sea’ in the string ‘She sells seashells on the sea shore’. | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Predict the output of the following:  amount\_inr=50000.00  exchange\_rate = 80.00  amount\_dol=amount\_inr/exchange\_rate  print('Amount = ',amount\_inr, ' INR')  print('Exchange Rate = ',exchange\_rate)  print('Amount = $ {:.2f}'.format(amount\_dol))  print('Amount = $ {:.2f}', amount\_dol)  print(type(exchange\_rate)) | CO1 | An | 10 |
|  | b. | Predict the output of the following:  a=15  b=-4  print('Addition a+b :',a+b)  print('Multiplication a\*b : ',a\*b)  print('Subtraction   a-b  :',a-b)  print('Division   a/b : ',a/b)  print('Integer Division   a//b : ',a//b)  print(‘Modulus : ',a%b)) | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | | **Number of Units** | **Fixed Charges (Rs.)** | **Energy Charges (Rs.)** | | --- | --- | --- | | Less than 100 | Nil | Nil | | 101-200 units | 20 | 1.50 /unit for units exceeding 100 units | | 201-500 units | 30 | 0 to 100 units      : Nil  101 to 200 units : Rs. 2.00 per unit  Above 200 units : Rs. 3.00 per unit | | 501 units and above | 50 | 0 to 100 units      :  Nil  101 to 200 units : Rs. 3.50 per unit  201 to 500 units : Rs. 4.60 per unit  Above 500 units : Rs. 6.60 per unit |   The domestic electricity tariff charges for the TNEB consumers is as shown in the table below:  Write a program to read the number of units consumed as input and calculate the electricity charges. | CO2 | A | 10 |
|  | b. | Differentiate ‘break’ and ‘continue’ using suitable examples. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Write a program to find the sum of first ‘n’ natural numbers using both ‘while’ loop and ‘for’ loop. | CO2 | A | 10 |
|  | b. | Write a program that reads text in a loop till the user provides a word without vowels as input. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 5. |  | Design a calculator that functions arithmetic operations on ‘n’ numbers using functions. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate arbitrary arguments with a suitable programming example. | CO3 | U | 10 |
|  | b. | Illustrate returning multiple values from functions with a suitable programming example. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | i. Define two sets: one with names of students playing football and another with names of students playing cricket.  ii. Write the code to display students who play both football and cricket.  iii. Write the code to display students who play only cricket.  iv. Write the code to display students who play either (or both) games.  v. Write the code to display students who play either (but not both) games. | CO4 | A | 10 |
|  | b. | Illustrate multiple inheritance using a programming example. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate any ten list operations with examples. | CO4 | U | 10 |
|  | b. | Illustrate operator overloading with a programming example. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Develop a Python program to read a text file or cpp file and convert it into lowercase. | CO6 | A | 10 |
|  | b. | Develop a program to open a text file and count the number of words in it and display the number of words. | CO6 | A | 10 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Summarize the basics of Python programming. |
| CO2 | Demonstrate the use of control flow statements in Python. |
| CO3 | Develop modules for reusability of code. |
| CO4 | Infer the concept of collections in Python. |
| CO5 | Illustrate object-oriented concepts. |
| CO6 | Make use of file-handling concepts. |

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



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| **Course Code** | **20CA2012** | **Duration** | **3hrs** |
| **Course Name** | **DATA STRUCTURES** | **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. | Define the space complexity and time complexity of an algorithm with an example. | CO1 | An | 10 |
|  | b. | Write an algorithm/pseudo code for linear search and mention the best-case and worst-case time complexity of the Linear Search algorithm. | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the different types of approaches used in the algorithm. | CO1 | U | 10 |
|  | b. | Construct the binary tree for given the expression   1. ((a + ((b/c) \* d)) – e) 2. ((a + b) – (c \* d)) % ((e ^f) / (g – h)) | CO6 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe the following array operations   1. Adding a new element 2. Deleting an existing element | CO2 | U | 10 |
|  | b. | Write a program to read and display n numbers using an array. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | 1. Write a program to find the mean of n numbers using arrays. (5) 2. Define an array. (2) 3. State an array initialization and find the Length of an array (3) | CO2 | An | 10 |
|  | b. | Define a linked list and explain the different types of linked lists with examples. | CO3 | R | 10 |
|  |  |  |  |  |  |
| 5. |  | Explain all the operations in a singly linked list. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the Towers of Hanoi stack application using disk=2 & 3 along with code. | CO4 | U | 15 |
|  | b. | Define push, and pop operations of the stack. | CO4 | R | 5 |
|  |  |  |  |  |  |
| 7. | a. | Explain the queue operations (enqueue, dequeue) along with the code. | CO4 | U | 10 |
|  | b. | Apply the Quicksort algorithm to sort the following elements: 50,30,10,90,80,20,40,70 | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain graph traversal techniques with example. | CO6 | U | 10 |
|  | b. | Describe the following types of trees with example   1. General tree 2. Binary tree 3. Expression tree | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Design an algorithm/ pseudocode for selection sort. Illustrate the working of selection sort on the following array with 7 elements: 30,45,25,32,55,60,49 | CO5 | A | 10 |
|  | b. | Write an algorithm to perform binary search on a given set of ‘n’ numbers. Using the algorithm search for the element 23 in the set [12, 23, 34, 44, 48, 53, 87, 99] | CO5 | A | 10 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Outline the different ways of arranging and handling collection of data. |
| CO2 | Organize data in arrays and perform operations. |
| CO3 | Organize and manipulate data using linked lists. |
| CO4 | Organize and manipulate data using stacks and queues. |
| CO5 | Understand searching and sorting techniques. |
| CO6 | Organize and manipulate data in trees and graphs. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 10 | - | 20 | - | - | 30 |
| CO2 | - | 10 | 20 | - | - | - | 30 |
| CO3 | 10 | 20 |  | - | - | - | 30 |
| CO4 | 5 | 25 |  | - | - | - | 30 |
| CO5 | - | 10 | 20 | - | - | - | 30 |
| CO6 | - | 20 | 10 | - | - | - | 30 |
| Total | - |  |  | - | - | - | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| **Course Code** | **20CA2012** | **Duration** | **3hrs** |
| **Course Name** | **DATA STRUCTURES** | **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. | Define data structures and explain the operation of data structures with examples. | CO1 | U | 10 |
|  | b. | Explain Time and Space Complexity with an example. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Write a program to print the position of the smallest number of n numbers using arrays. | CO2 | A | 10 |
|  | b. | Differentiate between the top-down and bottom-up approaches to problem-solving using algorithms. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Write an algorithm to insert a node at the beginning and middle of the list. | CO3 | A | 10 |
|  | b. | Explain insertion and deletion in a doubly linked list. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe the stack operations. | CO4 | R | 10 |
|  | b. | Explain the linked list implementation of stacks. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the Josephus Problem with an example. | CO4 | U | 10 |
|  | b. | 1. List out the application of the queue. (5) 2. Differentiate front and rear in a queue. (5) | CO4  CO4 | R  U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Write an algorithm to perform a linear search on a given set of numbers [44,48,12, 23, ,53,99,34,84]. Use the algorithm to search for the element 23. | CO5 | A | 10 |
|  | b. | Explain the bubble sort with an example. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | 1. Explain the Quick sort algorithm with an example. 2. Write a code for Quick sort. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Define graph. Explain the representation of a graph. | CO6 | R | 10 |
|  | b. | Define Tree. Explain the tree traversals algorithms with examples. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Write an algorithm/pseudocode to convert a given infix expression to a postfix expression. Trace the steps involved in converting the given infix expression ((A +B)^C)-((D\*C)/F) to a postfix expression. | CO4 | A | 20 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Outline the different ways of arranging and handling collection of data. |
| CO2 | Organize data in arrays and perform operations. |
| CO3 | Organize and manipulate data using linked lists. |
| CO4 | Organize and manipulate data using stacks and queues. |
| CO5 | Understand searching and sorting techniques. |
| CO6 | Organize and manipulate data in trees and graphs. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | - | 10 | - | - | - | 10 |
| CO3 | - | 10 | 10 | - | - | - | 20 |
| CO4 | 20 | 30 | 20 | - | - | - | 70 |
| CO5 | - | 20 | 10 | - | - | - | 30 |
| CO6 | 10 | 10 | - | - | - | - | 20 |
| Total | 30 | 100 | 50 | - | - | - | **180** |



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| **Course Code** | **20CA2014** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE MANAGEMENT SYSTEM** | **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. |  | Explain in detail about the Database System Architecture. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the various application of Database Management System. | CO1 | U | 10 |
|  | b. | Summarize the various types of users and database administrator in detail. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | Paraphrase about the following operations of relational algebra in detail.   1. Select 2. Project 3. Union 4. Difference 5. Rename | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss about the various notation of E-R Diagram in detail. | CO2 | U | 14 |
|  | b. | Construct an E-R Diagram for student pay the fees. | CO2 | C | 6 |
|  |  |  |  |  |  |
| 5. |  | Demonstrate the following E-R features in detail.   1. Aggregation 2. Generalization 3. Specialization | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Describe the following types of normalization.   1. 1NF 2. BCNF 3. 3NF 4. 4NF | CO2 | U | 20 |
|  |  |  |  |  |  |
| 7. | a. | Explain in detail about the two-phase locking protocol. | CO3 | U | 10 |
|  | b. | Discuss about trigger in detail. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe about the data manipulation language in detail. | CO4 | U | 10 |
|  | b. | Manipulate about the Transaction Control Language in detail. | CO4 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Develop a PL/SQL procedure for finding the multiplication two numbers. | CO5 | A | 10 |
|  | b. | Develop a PL/SQL procedure for finding the smallest of two numbers. | CO5 | A | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Evaluate business information problem and find the requirements of a problem in terms of data. |
| CO2 | Summarize about database schema and need for normalization. |
| CO3 | Design the database schema with the use of appropriate data types for storage of data in database. |
| CO4 | Use different types of physical implementation of database. |
| CO5 | Construct simple and moderately advanced database queries using Structured Query Language (SQL). |
| CO6 | Facilitate students to understand the concept of triggers. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 40 |  |  |  |  | 40 |
| CO2 |  | 54 |  |  |  | 6 | 60 |
| CO3 |  | 10 |  |  |  |  | 10 |
| CO4 |  | 40 |  |  |  |  | 40 |
| CO5 |  |  | 20 |  |  |  | 20 |
| CO6 |  | 10 |  |  |  |  | 10 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2023** | **Duration** | **3hrs** |
| **Course Name** | **MACHINE LEARNING** | **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. | Classify the types of supervised learning algorithms. | CO1 | R | 10 |
|  | b. | Illustrate the following  i) Slicing in the arrays.  ii) Maximum minimum and sum of the arrays. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain in detail about the logic behind recognizing the documents. | CO2 | U | 10 |
|  | b. | Summarize the concept behind the classification. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain briefly about the non-parametric classification algorithm. | CO2 | R | 10 |
|  | b. | Illustrate the steps in classification using the construction of decision tree. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize the concepts of SVM. | CO4 | R | 10 |
|  | b. | Briefly discuss about the k-means algorithm. | CO5 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate with an example to construct a classifier using Bayesian theorem. | CO5 | U | 10 |
|  | b. | Explain in detail about locally weighted linear regression. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain in detail about conditional probability. | CO4 | U | 10 |
|  | b. | Describe linear regression in detail. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain in details about dimensionality reduction techniques. | CO3 | R | 10 |
|  | b. | Extract the logic in identifying frequent item sets using FB growth. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain briefly about the classification and regression tree in detail. | CO6 | R | 10 |
|  | b. | Illustrate the types of tree pruning. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Describe the concept behind Principle Component Analysis. | CO6 | R | 10 |
|  | b. | Explain briefly about forecasting numerical values using regression with example. | CO5 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Define the terminologies of Machine learning. |
| CO2 | Describe the concepts of Naïve Bayes theory and decision trees. |
| CO3 | Apply the algorithm of Support vector machines and Logistic regression in the real time problems. |
| CO4 | Analyze the regression models. |
| CO5 | Design unsupervised Learning algorithms using k-means clustering and Association analysis. |
| CO6 | Modify the data using principal component and singular value decomposition. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  |  |  |  |  | 20 |
| CO2 | 10 | 20 |  |  |  |  | 30 |
| CO3 | 20 | 10 |  |  |  |  | 30 |
| CO4 | 20 | 10 |  |  |  |  | 30 |
| CO5 | 10 | 30 |  |  |  |  | 40 |
| CO6 | 20 | 10 |  |  |  |  | 30 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA2030** | **Duration** | **3hrs** |
| **Course Name** | **OPERATING SYSTEMS SECURITY** | **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. | Classify the services provided by Operating System. | CO1 | R | 10 |
|  | b. | Illustrate the types of kernel attacks. | CO6 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the co-operating process in detail. | CO3 | U | 10 |
|  | b. | Summarize the concept behind Inter Process Communication. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe in detail about deadlocks and its prevention mechanism. | CO3 | R | 10 |
|  | b. | Illustrate the steps in information gathering. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain in detail about contiguous memory allocation. | CO4 | R | 10 |
|  | b. | Compare the memory corruption vulnerabilities. | CO6 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate the concept behind segmentation in paging. | CO2 | R | 10 |
|  | b. | Classify the importance of authentication. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the page replacement algorithms in detail. | CO4 | U | 10 |
|  | b. | Compare the input-output hardware and input-output software. | CO5 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Extract the file organization types and explain each of its types in detail. | CO1 | U | 10 |
|  | b. | Explain in detail about FCFS disk scheduling algorithm and  SSTF (shortest seek time first) algorithm. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the idea of demand paging. | CO4 | R | 10 |
|  | b. | Classify the types of computer security. | CO1 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Summarize the types of storage devices used in computer. | CO2 | R | 10 |
|  | b. | Explain in detail about FCFS CPU Scheduling and round robin CPU scheduling algorithms. | CO5 | U | 10 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Describe the Operating System concepts. |
| CO2 | Explain the Operating Structure and Storage hierarchy. |
| CO3 | State process management. |
| CO4 | Show the capability in handling efficiently the Protection mechanism and the storage. |
| CO5 | Discuss the Operating System Security and Protection mechanism. |
| CO6 | Outline the kernel exploit. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 10 |  |  |  |  | 30 |
| CO2 | 20 | 10 |  |  |  |  | 30 |
| CO3 | 10 | 20 |  |  |  |  | 30 |
| CO4 | 20 | 10 |  |  |  |  | 30 |
| CO5 | 20 | 10 |  |  |  |  | 30 |
| CO6 | 20 | 10 |  |  |  |  | 30 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2031** | **Duration** | **3hrs** |
| **Course Name** | **CYBER CRIMES AND CYBER SECURITY** | **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. | List out the factors influencing Cybercrime. | CO1 | R | 10 |
|  | b. | Explain about Man-in-the-middle (MITM) and Salami attack. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain about the crimes associated with mobile electronic communication devices. | CO1 | U | 10 |
|  | b. | Describe in detail the computer viruses and worms. | CO1 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Illustrate Online Pedophilia. | CO2 | U | 10 |
|  | b. | Recall and write a note on Deep web and Dark web. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | List out and explain the types of Cryptocurrencies. | CO2 | R | 10 |
|  | b. | Explain in detail about Blockchain. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain about Auction fraud and Online Pharmacies. | CO3 | U | 10 |
|  | b. | Recall and write a note on Online credit card fraud. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain in detail about fraud via data manipulation. | CO3 | U | 10 |
|  | b. | Describe DoS and DDoS attacks. | CO3 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain in detail about windows tokens. | CO4 | U | 10 |
|  | b. | Illustrate virtualization. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe Packet filtering firewalls and stateful firewalls in detail. | CO4 | R | 10 |
|  | b. | Explain about Window messaging. | CO4 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain in detail about Click fraud. | CO5 | U | 10 |
|  | b. | Describe about Brute force and Dictionary attacks. | CO6 | R | 10 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Categorize the changes in society associated with the advent of technological changes and the introduction of the internet. |
| CO2 | Explain computer-related crime. |
| CO3 | Develop a working knowledge of the classifications of motive for modern computer intruders and how they relate to each other in the digital security realm. |
| CO4 | Discuss the basic concepts of cryptographic technology and the major mathematical principles used by cryptographic systems. |
| CO5 | Describe the risks posed by the various types of malicious code objects and develop adequate countermeasures to protect the systems. |
| CO6 | Access and mitigate vulnerabilities. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 20 | - | - | - | - | 40 |
| CO2 | 20 | 20 | - | - | - | - | 40 |
| CO3 | 20 | 20 | - | - | - | - | 40 |
| CO4 | 10 | 30 | - | - | - | - | 40 |
| CO5 | - | 10 | - | - | - | - | 10 |
| CO6 | 10 | - | - | - | - | - | 10 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2032** | **Duration** | **3hrs** |
| **Course Name** | **INFORMATION SECURITY** | **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. | Identify any 10 common threats or attacks on data and information. | CO1 | U | 10 |
|  | b. | Analyze case studies related to any two top security issues and discuss the risk mitigation measures. | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Categorize the information system controls. | CO1 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Categorize the various threats to physical infrastructure. | CO2 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Analyze the risks, threats, and attacks related to access control. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 5. | a. | Summarize the methods of destroying sensitive data. | CO3 | U | 10 |
|  | b. | Identify any five application security practices and explain them. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the different ways of storing protected health information. | CO3 | U | 10 |
|  | b. | Prepare any 10 functional requirements of an *Address book* and analyze them in terms of input, functionality and output. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. |  | Classify the operational controls recommended to be used in an organization and explain their role in organizational security. | CO5 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the types of Intrusion Detection Systems and their intrusion detection approaches. | CO5 | U | 10 |
|  | b. | Summarize the steps and best practices taken to ensure operational security. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Illustrate the working of DES encryption algorithm. | CO6 | A | 10 |
|  | b. | Distinguish between symmetric and asymmetric key encryption and analyze their pros and cons with respect to specific scenarios. | CO6 | An | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Explain information security concepts and how they relate to one another helps security professionals design and implement secure systems. |
| CO2 | Apply various concepts, methodology, techniques and provide user access to resources. |
| CO3 | Classify information based on its value to the organization. |
| CO4 | Apply security in the software development life cycle and assess the effectiveness of software security. |
| CO5 | Discuss the ongoing, day-to-day management of security functions. |
| CO6 | Explain the basic terminology of cryptography and apply various key algorithms. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 10 |  | 30 |  |  | 40 |
| CO2 |  |  |  | 40 |  |  | 40 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  | 10 | 10 |  |  |  | 20 |
| CO5 |  | 20 |  | 20 |  |  | 40 |
| CO6 |  |  | 10 | 10 |  |  | 20 |
|  |  | 60 | 20 | 100 |  |  | **180** |



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| **Course Code** | **20CA2033** | **Duration** | **3hrs** |
| **Course Name** | **CYBER FORENSICS** | **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. | Define Forensic Science. Tell about fields in Forensic Science. | CO1 | R | 8 |
|  | b. | What is Cyber forensics? Recite two primary objectives and goal of Cyber Forensics. Give the difference between computer forensics and cyber forensics. | CO1 | R | 12 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Interpret the basic principles of Cyber Forensics. | CO2 | U | 5 |
|  | b. | Summarize various files and file systems that are used to store data in computer drives. | CO2 | U | 15 |
|  |  |  |  |  |  |
| 3. |  | Correlate the following key terms   1. Sector B) Cluster C) Slack Space D) Lost Cluster   E) Bad Sector F) MBR G) Nibble | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Relate and list out the tools used to extract deleted files in windows and Linux. | CO4 | A | 5 |
|  | b. | Summarize in detail about Cryptography, history of Encryption and various algorithms. | CO4 | U | 15 |
|  |  |  |  |  |  |
| 5. | a. | Discuss various Operating System utilities. List all the listening ports. | CO5 | U | 15 |
|  | b. | Sketch a way to capture Direct Evidence of Crimes. | CO5 | A | 5 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain in detail about TCP Header with suitable diagram. Judge the difference between TCP and UDP. | CO3 | E | 12 |
|  | b. | Explain about Data Acquisition, and various storage formats acquired during digital evidence. | CO2 | R | 8 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the use of log files gathered from various digital devices. | CO4 | An | 15 |
|  | b. | Relate the advantages and disadvantages of wireless networks. | CO5 | A | 5 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Discuss the crimes happening in online games. Write notes on electronic discovery. What is Big Data? | CO6 | R | 12 |
|  | b. | Relate the various types of investigation. | CO6 | A | 8 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Relate and list out 4 different port numbers and its functions. | CO6 | U | 5 |
|  | b. | Develop a way by which imaging can be done from original drive and prove its integrity. | CO6 | C | 15 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Describe cyber forensics and the knowledge required to do the forensic analysis. |
| CO2 | Extend Scientific approaches to forensics that helps to identify, classify, locate and recover the evidence. |
| CO3 | Choose and apply current cyber forensics tools. |
| CO4 | Devise basic network forensic analysis. |
| CO5 | Identify the emerging forensic technology. |
| CO6 | Show the required knowledge and expertise to become a proficient forensic investigator. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  |  |  |  |  | 20 |
| CO2 | 8 | 20 |  |  |  |  | 28 |
| CO3 |  |  |  | 20 | 12 |  | 32 |
| CO4 |  | 15 | 5 | 15 |  |  | 35 |
| CO5 |  | 15 | 10 |  |  |  | 25 |
| CO6 | 12 | 5 | 8 |  |  | 15 | 40 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2035** | **Duration** | **3hrs** |
| **Course Name** | **COMPUTER NETWORKS AND NETWORK SECURITY** | **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. | Differentiate IPv4 and IPv6. | CO1 | An | 4 |
|  | b. | Enumerate on the types of distant vector routing protocols. | CO2 | R | 16 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain in detail routers and routing table. | CO2 | U | 10 |
|  | b. | Summarize on Open Shortest Path First Protocol. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain in detail Internet and Transport layer protocols. | CO3 | U | 10 |
|  | b. | Explain in detail packet-filtering, circuit-level, and stateful-inspection firewall. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize on Ethernet cables. | CO1 | U | 10 |
|  | b. | Differentiate 2-tier and 3-tier architecture. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain in detail WAN devices. | CO4 | U | 10 |
|  | b. | Explain in detail WAN operations. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate the configuration of security in switch port. | CO3 | U | 10 |
|  | b. | Summarize 802.1x protocol and DHCP snooping. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain in detail static and dynamic IP addressing. | CO5 | U | 10 |
|  | b. | Enumerate on network device management. | CO6 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate on network device monitoring. | CO6 | U | 10 |
|  | b. | Summarize on IDPS. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Illustrate on the working of data-link, network and transport layer of the OSI model. | CO1 | U | 12 |
|  | b. | Explain in detail the application layer protocols in TCP/IP model. | CO1 | U | 8 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Describe OSI and TCP/IP model, compare and contrast network topologies and also select the appropriate cabling type based on implementation requirements. |
| CO2 | Explain various router components, remotely access routers, and test network connectivity. |
| CO3 | Demonstrate a detailed knowledge of the operation and configuration of switches. |
| CO4 | Configure and understand the components and operation of a wireless LAN (WLAN). |
| CO5 | Demonstrate expertise in configuring host and network level technical security controls. |
| CO6 | Identify core networking and infrastructure components and design an IT infrastructure including devices, topologies, protocols, systems software, management, and security. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 30 |  | 4 |  |  | 34 |
| CO2 | 16 | 20 |  |  |  |  | 36 |
| CO3 |  | 40 |  |  |  |  | 40 |
| CO4 |  | 20 |  |  |  |  | 30 |
| CO5 |  | 20 |  |  |  |  | 20 |
| CO6 | 10 | 10 |  |  |  |  | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2037** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE SECURITY** | **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. |  | Describe about the different types of normalization in detail. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Draw and explain an E-R diagram for paying electricity charges by a customer. | CO1 | A | 10 |
|  | b. | Discuss the different indexing techniques. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | Demonstrate query optimization in detail. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe the lock-based protocol in detail. | CO3 | U | 10 |
|  | b. | Discuss the ACID properties. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 5. |  | Discuss the applications and operations of the relational algebra in detail. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | State the different notations in ER model. | CO1 | R | 12 |
|  | b. | Discuss on the Enterprise Database Security. | CO4 | U | 8 |
|  |  |  |  |  |  |
| 7. |  | Demonstrate Proxy and Strong Authentication in detail. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe the security features which can be adopted for banking applications. | CO4 | U | 10 |
|  | b. | Explain the database auditing in detail. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Discuss the various RAID level in detail. | CO6 | U | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Design and develop database. |
| CO2 | Write efficient and complex queries. |
| CO3 | Identify proper authentication and authorization techniques for Database applications. |
| CO4 | Design multilevel security scheme for database. |
| CO5 | Perform database auditing and database performance tuning. |
| CO6 | Perform database backup and recovery. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 12 | 10 | 10 |  |  |  | 32 |
| CO2 |  | 60 |  |  |  |  | 60 |
| CO3 |  | 40 |  |  |  |  | 40 |
| CO4 |  | 18 |  |  |  |  | 18 |
| CO5 |  | 10 |  |  |  |  | 10 |
| CO6 |  | 20 |  |  |  |  | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2039** | **Duration** | **3hrs** |
| **Course Name** | **BIOMETRIC SECURITY** | **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. | Explain the various methods of traditional person recognition systems and analyze their drawbacks. Justify that biometrics can be an effective solution for identification and verification. | CO1 | An | 10 |
|  | b. | Simulate the basic building blocks of biometric systems highlighting the necessity and functionality of each component. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Identify the features of any five commonly used biometric traits that make them appropriate for providing security. | CO1 | U | 10 |
|  | b. | Compare and contrast the three important functionalities of a biometric system. | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | Simulate a facial scan system with its essential components and explain its working. | CO2 | A | 10 |
|  | b. | Identify any two applications of facial scan systems and discuss the effectiveness of facial scan in those applications. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Categorize iris scan systems and the methods used for image acquisition in each type. | CO2 | An | 10 |
|  | b. | Explain the components and working of voice scan systems. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate the working of signature scan systems and justify how they are effective in security applications. | CO3 | An | 10 |
|  | b. | Identify any two behavioral biometrics and explain their working. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Compare and contrast AFIS scan systems with finger scan systems. | CO3 | An | 10 |
|  | b. | Summarize the strengths and weaknesses of facial scan systems. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Identify any two citizen-facing applications and explain the effectiveness of biometrics in such applications. | CO4 | U | 10 |
|  | b. | Infer that facial scan is the best suited biometric trait for surveillance applications. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate the effectiveness of biometrics in employee-facing applications. | CO4 | U | 10 |
|  | b. | Apply DNA matching to solve a problem related to criminal identification. | CO5 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Choose any one case study and use it to discuss how biometric technology can be successfully used as a secure authentication mechanism to overcome the challenges in the traditional authentication system. | CO6 | A | 10 |
|  | b. | Discuss the recent trends in biometric technologies and applications in various areas and the challenges and limitations. | CO6 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Describe the principles of biometric systems. |
| CO2 | Recognize the various modules constituting a biometric system. |
| CO3 | Explain different types of biometric traits. |
| CO4 | Analyze basic biometric system applications. |
| CO5 | Identify the sociological and acceptance issues associated with the design and implementation of biometric systems. |
| CO6 | Infer the challenges and limitations associated with biometrics. |

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



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| **Course Code** | **20CA2040** | **Duration** | **3hrs** |
| **Course Name** | **GENERAL FORENSIC SCIENCE** | **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. | Explain any five forensic science services in detail. | CO1 | U | 10 |
|  | b. | Identify the role of a forensic expert with a suitable explanation of the types of hearings. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | List down the various divisions of forensic science and explain any four in detail. | CO1 | R | 20 |
|  |  |  |  |  |  |
| 3. | a. | Discuss the various stages of reconstruction of a crime scene with a detailed explanation. | CO2 | U | 10 |
|  | b. | Examine the format of writing a suitable Crime Scene Reconstruction (CSR) report. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Adapt the Behavioral Evidence Analysis strategy in profiling criminals during CSR. | CO2 | C | 20 |
|  |  |  |  |  |  |
| 5. | a. | Describe the examining patterns of the forensic evidence using Forensic Biology. | CO4 | R | 10 |
|  | b. | Illustrate the computer crime scene investigation. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | State the methods used in Forensic Chemistry and its application areas in everyday life activities. | CO5 | R | 20 |
|  |  |  |  |  |  |
| 7. |  | Name the various cybercrimes and the techniques to prevent the occurrences. | CO6 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Evaluate the computer forensic analysis and the processing of an electronic crime scene. | CO6 | E | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Examine the different concepts used in the investigation of a crime scene. | CO2 | A | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the history of the forensic sciences. |
| CO2 | Define the roles of different types of professionals involved in evaluating a crime scene and collecting the evidence. |
| CO3 | State the aspects of the justice system followed. |
| CO4 | Outline the methodology of collecting & interpreting data, avoiding contamination, and preservation of chain of custody. |
| CO5 | State the importance pertaining to forensic examination. |
| CO6 | Show the evidence in a professional (courtroom) setting. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 30 | - | - | - | - | - | 30 |
| CO2 | - | 10 | 30 | - | - | 20 | 60 |
| CO3 | 10 | - | - | - | - | - | 10 |
| CO4 | 10 | - | - | - | - | - | 10 |
| CO5 | 20 | 10 | - | - | - | - | 30 |
| CO6 | 20 | - | - | - | 20 | - | 40 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2041** | **Duration** | **3hrs** |
| **Course Name** | **MALWARE ANALYSIS AND ITS SECURITY** | **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. | Explain in detail on the malware analysis tools and its working. | CO1 | U | 10 |
|  | b. | Illustrate on string extraction in malware with an example tool. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Demonstrate the detection of file type for static malware analysis. | CO1 | U | 10 |
|  | b. | Illustrate on components used in design of anti-malware programs. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Illustrate on classifying malware using fuzzy hash and imphash. | CO2 | U | 10 |
|  | b. | Explain in detail on fingerprinting the malware with example utilities and tool. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate on the use of YARA tool for static malware analysis. | CO2 | U | 12 |
|  | b. | Explain in detail on the inspection of PE header in executable files. | CO2 | U | 8 |
|  |  |  |  |  |  |
| 5. | a. | Summarize on the four monitoring techniques needed for dynamic analysis. | CO3 | U | 8 |
|  | b. | Summarize on different network protocols. | CO3 | U | 12 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Enumerate on the steps in dynamic analysis. | CO3 | R | 8 |
|  | b. | Illustrate on the functions of network monitoring systems. | CO3 | U | 12 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the drawbacks of using sandboxes. | CO4 | U | 10 |
|  | b. | Illustrate the working of Windows registry monitoring. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Recall on the techniques used for researching domain names for identifying malicious websites with an example tool. | CO5 | R | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Demonstrate the working of brute force and reverse brute force attack. | CO6 | U | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concept of malware analysis, types of malware analysis and differentiate malware and a virus. |
| CO2 | Classify and compare the malware samples and Extract strings, functions, and metadata associated with the file. |
| CO3 | Use Dynamic analysis tools and understand their features, steps involved in dynamic analysis. |
| CO4 | Describe the possibilities that can make experience with sandboxes and multi-AV scanners even better. |
| CO5 | Identify and correlate information regarding domains, hostnames, and IP addresses. |
| CO6 | Discuss the challenges encountered in the field of malware analysis. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | 40 | - | - |  |  | 40 |
| CO3 | 8 | 32 | - | - | - | - | 40 |
| CO4 | - | 20 | - | - |  |  | 20 |
| CO5 | 20 | - | - | - | - | - | 20 |
| CO6 | - | 30 | - | - | - | - | 30 |
|  | | | | | | | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| **Course Code** | **20CA2041** | **Duration** | **3hrs** |
| **Course Name** | **MALWARE ANALYSIS AND ITS SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20 MARKS = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain in detail the different types of malware. | CO1 | U | 10 |
|  |  | Illustrate on malware analysis and malicious actions performed by malware. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Recall on different techniques used for malware analysis. | CO1 | U | 10 |
|  | b. | Explain in detail the working of file obfuscation for hiding malware and the techniques used to perform obfuscation. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Illustrate on the use of hashing for analyzing malware with example tools. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Demonstrate on the working of different techniques and tools for classifying malware. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5 | b. | Summarize on different protocols in TCP/IP model. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate on windows registry analysis and use of regshot for analysis. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the working of CW sandbox and ANUBIS. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Recall on the techniques used for researching IP address for malware analysis with example tool. | CO5 | R | 13 |
|  |  | Demonstrate the working of DNS and passive DNS in malware analysis. | CO5 | U | 7 |
| **PART – B (1 X 20 MARKS = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain in detail the types of anti-malware programs. | CO6 | U | 6 |
|  | b. | Summarize on the technological components of anti-malware engine. | CO6 | U | 14 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concept of malware analysis, types of malware analysis and differentiate malware and a virus. |
| CO2 | Classify and compare the malware samples and Extract strings, functions, and metadata associated with the file. |
| CO3 | Use Dynamic analysis tools and understand their features, steps involved in dynamic analysis. |
| CO4 | Describe the possibilities that can make experience with sandboxes and multi-AV scanners even better. |
| CO5 | Identify and correlate information regarding domains, hostnames, and IP addresses. |
| CO6 | Discuss the challenges encountered in the field of malware analysis. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 30 | - | - | - | - | 40 |
| CO2 | - | 40 | - | - |  |  | 40 |
| CO3 | - | 40 | - | - | - | - | 40 |
| CO4 | - | 30 | - | - |  |  | 30 |
| CO5 | 13 | 7 | - | - | - | - | 20 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA2042** | **Duration** | **3hrs** |
| **Course Name** | **SECURITY ASSESSMENT OF INFORMATION SYSTEMS THROUGH ETHICAL HACKING** | **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. | Explain the following terms with respect to Ethical Hacking  a) Hack Value b) Exploit c) Vulnerability  d) Zero day attack e) Daisy Chaining | CO1 | U | 15 |
|  | b. | List down 5 risk responses. | CO1 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Write short notes on the following   1. White hat hacker b. Black hat hacker c. Script kiddee   d. Payload e. Vulnerability | CO1 | R | 15 |
|  | b. | With neat diagram, discuss CIA triangle. | CO1 | U | 5 |
|  |  |  |  |  |  |
| 3. | a. | Classify the common Hacking methodologies. | CO2 | An | 12 |
|  | b. | Classify Trojans and Backdoors and write description of its working. | CO2 | An | 8 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize how footprinting is done using social networking site. | CO2 | E | 10 |
|  | b. | Explain any 5 footprinting tools. | CO2 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain cross-site scripting (XSS) and its two types of variants. | CO3 | U | 12 |
|  | b. | Discuss about web application hacking methodology. | CO3 | R | 8 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Determine the ways by which Android phone could be hacked. | CO3 | U | 5 |
|  | b. | Explain password cracking. Distinguish the various types of Password cracking attacks. | CO4 | U | 15 |
|  |  |  |  |  |  |
| 7. | a. | Tabulate various types of IEEE standard 802.11 and compare its properties. | CO4 | R | 8 |
|  | b. | List down web application threats and tools used for web attack. | CO4 | R | 12 |
|  |  | **(OR)** |  |  |  |

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| 8. | a. | Write short notes on the following terms   1. Access Point b) SSID c) BSSID d) Bandwidth | CO5 | A | 15 |
|  | b. | Recommend the ways for protecting network with security devices. | CO5 | A | 5 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Summarize windows information gathering Phases. | CO6 | A | 8 |
|  | b. | Write briefly about top 10 Windows Vulnerabilities. | CO6 | R | 12 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Determine the security threats and vulnerabilities in computer networks using ethical hacking techniques. |
| CO2 | Identify various attacks in various domains of cyber space. |
| CO3 | Select the tools to gather the information regarding the vulnerabilities. |
| CO4 | Use techniques, skills and modern tools necessary to gather the information and to identify the  vulnerabilities. |
| CO5 | Discuss about the exploits in various operating systems and Wireless environment. |
| CO6 | Identify the vulnerabilities associated with various network applications and database system. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | 20 | 20 |  |  |  |  | 40 |
| CO2 | 10 |  |  | 20 | 10 |  | 40 |
| CO3 | 8 | 17 |  |  |  |  | 25 |
| CO4 | 20 | 15 |  |  |  |  | 35 |
| CO5 |  |  | 20 |  |  |  | 20 |
| CO6 | 12 |  | 8 |  |  |  | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2044** | **Duration** | **3hrs** |
| **Course Name** | **CYBERSECURITY GOVERNANCE** | **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. | Explain any FIVE possible threats to an online shopping site like Amazon. | CO1 | A | 10 |
|  | b. | Consider an IT company like Infosys. Explain how you can plan to expand the intelligence-related roles in it. Explain the roles in detail. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the need of cybersecurity governance. | CO1 | U | 10 |
|  | b. | Detail on the basic steps involved in cybersecurity risk analysis. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Identify and list the people responsible for a cybersecurity risk in a software company. Explain their roles and responsibilities. | CO2 | A | 10 |
|  | b. | Explain the baseline controls required to protect and ensure cybersecurity in a company. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Governance versus Management: Discuss on any FIVE points. | CO2 | U | 10 |
|  | b. | If you are to provide some tips to top CISO’s in a software, what could be them? Suggest any three tips. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | The Week magazine reports as follows:  More than 11.5 lakh incidents of cyberattacks were tracked and reported to India’s Computer Emergency Response Team (CERT-In) in 2021. According to official estimates, ransomware attacks have increased by 120 per cent in India. Power companies, oil and gas majors, telecom vendors, restaurant chains and even diagnostic labs have been victims of cyberattacks.   1. If this is the scenario in our country, what kind of business plans are to be made to safeguard the systems? (6 marks) 2. How can we ensure business continuity, inspite of attacks? (4 marks) 3. Identify the components required in a Business Continuity (BC) Framework. (6 marks) 4. Explain the necessary components to prevent a trojan horse attack on a telecommunication company like Airtel. (4 marks) | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe in detail on strategy resources and constraints. | CO4 | R | 10 |
|  | b. | Will cybersecurity fail without strategy?  Justify your answer with suitable examples.  What would be the future of cybersecurity in your perspective? | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain ISO standard in detail. | CO5 | R | 10 |
|  | b. | Differentiate the purpose of ISO 27001 and ISO 27002. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain C2M2. Differentiate it from CMM. | CO5 | U | 10 |
|  | b. | Explain any TWO components of C2M2 in detail. | CO5 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Compare and contrast civil and criminal law. (Any FOUR points each) | CO6 | U | 8 |
|  | b. | Compare and contrast Computer Security Act and other derived acts in the US to secure data and communication, with the acts available in India. Explain the context with a suitable case study. Compare the punishments and action taken in both the countries effectively. | CO6 | A | 12 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the basics of cyber security governance |
| CO2 | Develop an Information Security Strategy |
| CO3 | State the need for resilience management |
| CO4 | Describe the existing and emerging security strategy |
| CO5 | Select a governing control or standards framework |
| CO6 | Discuss the various compliance laws |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 20 | 20 | - | - | - | 40 |
| CO2 | - | 20 | 20 |  | - | - | 40 |
| CO3 | - | - | - | 20 | - | - | 20 |
| CO4 | 10 | - | 10 | - | - | - | 20 |
| CO5 | 20 | 20 | - | 10 | - | - | 40 |
| CO6 | - | 8 | 12 | - | - | - | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2045** | **Duration** | **3hrs** |
| **Course Name** | **SECURITY OF WEB APPLICATIONS** | **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. | Describe the Secure Development life cycle. | CO1 | U | 10 |
|  | b. | Explain the two main categories of coding, scripting and programming for creating Web Applications. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the two most common varieties of Web application attacks. | CO2 | U | 10 |
|  | b. | Describe the following   1. CSRF. 2. Cross-Origin Resource Sharing | CO2 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe the seven best practices or steps to Vulnerability Management. | CO1 | U | 10 |
|  | b. | Illustrate the following   1. Web of distrust 2. Logic attacks | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe the different ways of Session cookies compromised in web browser. | CO3 | U | 10 |
|  | b. | Explain the web browser security. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the different types of Phishing attacks. | CO4 | U | 10 |
|  | b. | Explain the Components of web browser. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain Computer-Based Identification Techniques. | CO4 | U | 10 |
|  | b. | Explain the different alternatives for creating and storing private keys. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Describe the following   1. Digital certificates 2. Digital signature | CO5 | R | 10 |
|  | b. | Explain the Deploying SSL Server Certificates | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the different types of physical securities for web servers. | CO6 | U | 10 |
|  | b. | Describe the following   1. Log files 2. Picking great password. | CO5 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discuss the following   1. Three Colors of Scanning 2. Payment Card Industry Data Security Standard | CO1 | U | 10 |
|  | b. | Describe Security for Web Applications. | CO6 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Explain Web Application architecture and technologies. |
| CO2 | Identify and handle Web Application Attacks. |
| CO3 | Defend web browser from attacks |
| CO4 | State the importance of web authentication and authorization |
| CO5 | Exhibit privacy for users |
| CO6 | Exhibit the skills in securing Web server |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 40 | - | - | - | - | 40 |
| CO2 | 10 | 20 | - | - | - | - | 30 |
| CO3 | - | 30 | - | - | - | - | 30 |
| CO4 | - | 30 | - | - | - | - | 30 |
| CO5 | 20 | - | - | - | - | - | 20 |
| CO6 | - | 30 | - | - | - | - | 30 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2045** | **Duration** | **3hrs** |
| **Course Name** | **SECURITY OF WEB APPLICATIONS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the architecture of web application. | CO1 | U | 10 |
|  | b. | Describe the Secure Development life cycle. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain in detail about Cross site scripting. | CO2 | U | 10 |
|  | b. | Describe CSRF. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe in detail about SQL injection. | CO2 | U | 10 |
|  | b. | Describe the seven best practices or steps to Vulnerability Management. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the different phases of Browser hacking methodology. | CO3 | U | 10 |
|  | b. | Describe the different ways of Session cookies compromised in web browser. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the different types of authentication method for Web application. | CO4 | U | 10 |
|  | b. | Describe the following   1. ARP Spoofing 2. DNS prefetching | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain in detail about public key infrastructure. | CO5 | U | 10 |
|  | b. | Describe front end and back end framework for Web application. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the different types of Web browser attack. | CO3 | U | 10 |
|  | b. | Illustrate the following   1. Breaking the authentication schemes 2. Document Author Identification Using PGP | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the different types of physical securities for web servers. | CO6 | U | 10 |
|  | b. | Describe the Deploying SSL Server Certificates. | CO6 | U | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain the Components of web browser. | CO3 | U | 10 |
|  | b. | Describe the following   1. Log files 2. Picking great password. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain Web Application architecture and technologies. |
| CO2 | Identify and handle Web Application Attacks. |
| CO3 | Defend web browser from attacks |
| CO4 | State the importance of web authentication and authorization |
| CO5 | Exhibit privacy for users |
| CO6 | Exhibit the skills in securing Web server |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | 40 | - | - | - | - | 40 |
| CO3 | - | 40 | - | - | - | - | 40 |
| CO4 | - | 20 | - | - | - | - | 20 |
| CO5 | - | 30 | - | - | - | - | 30 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA2046** | **Duration** | **3hrs** |
| **Course Name** | **DATA MINING IN CYBER SECURITY** | **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. | Illustrate the various data mining functionalities. | CO1 | U | 10 |
|  | b. | Paraphrase about the partitioning in terms of data mining. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Classify the different types OLAP server architecture in detail. | CO2 | U | 10 |
|  | b. | Describe about the different types OLAP operation in detail. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Express the data mining architecture. | CO1 | U | 10 |
|  | b. | Devise the various applications of data mining. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Represent the following Data Mining techniques for Privacy preservation and Anomaly detection.   1. KNN 2. Decision tree 3. Association rule 4. K-means clustering | CO5 | U | 20 |
|  |  |  |  |  |  |
| 5. | a. | Discuss about the requirements of clustering in data mining. | CO4 | U | 10 |
|  | b. | Describe about the multimedia data mining in detail. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Explain about the following clustering methods in detail.   1. K-means 2. K-medoids 3. Clara | CO4 | U | 20 |
|  |  |  |  |  |  |
| 7. |  | Discuss about the various classification techniques in detail. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Explain about the malware attacks detection in the day-to-day activities. | CO6 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discriminate the email worm detection by applying stream mining. | CO6 | An | 10 |
|  | b. | Categorize the detecting malicious executables by applying Data Mining techniques. | CO6 | An | 10 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Explain various components and processes of data warehouse. |
| CO2 | Design and implement Data Warehouse to industrial requirements. |
| CO3 | Apply in association rule and classification technique in handling organizational problems. |
| CO4 | Identify pattern and knowledge hidden in complex types of data. |
| CO5 | Identify and handle anomaly detection in network. |
| CO6 | Apply appropriate data mining technique in handling Malware attacks. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 40 |  |  |  |  | 40 |
| CO2 |  | 20 |  |  |  |  | 20 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  | 40 |  |  |  |  | 40 |
| CO5 |  | 20 |  |  |  |  | 20 |
| CO6 |  | 20 |  | 20 |  |  | 40 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA2047** | **Duration** | **3hrs** |
| **Course Name** | **EMAIL AND MOBILE FORENSICS** | **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. | Explain any FIVE email crimes in current day’s scenario. | CO1 | A | 10 |
|  | b. | Explain the components of email system with a block diagram. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | 1. Explain how the concept of logs is helpful in investigation (3 marks). 2. List down the different types of server logs (4 marks). 3. Also, explain how network email logs help in identifying criminals (3 marks). | CO1 | A | 10 |
|  | b. | Write notes on Forensic Email Analysis Tool with suitable examples. | CO1 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain how OSForensics tool helps specifically in investigating emails. | CO2 | R | 10 |
|  | b. | Explain the role of Hex editor in Cybercrime Investigations. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain how emails and email headers can be forged with a suitable example. | CO2 | U | 10 |
|  | b. | Elaborate on any TWO email investigation techniques. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Gmail is one among the largest free email service, provided by Google. Google's mail servers automatically scan emails for multiple purposes, including to filter spam and malware, and to add context-sensitive advertisements next to emails. Being a user of gmail, it is essential to know of its usage and working mechanisms. Answer the following questions connected to its provisions.   1. Is email from Google users to other Google users encrypted in transit? Justify your answer. (3 marks) 2. How does encryption in transit relate to HTTPS access to Gmail? (3 marks) 3. Why isn’t all email sent to or from Gmail encrypted in transit? (4 marks) | CO3 | An | 10 |
|  | b. | Discuss on any FOUR threats to email servers. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | 1. Explain the need of SIM cards in mobile devices. (5 marks) 2. List down the different types of sim card and their usage. (5 marks) | CO4 | A | 10 |
|  | b. | Write notes on mobile forensic process. | O4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | 1. Compare and contrast physical acquisition and manual acquisition. (4 marks) 2. How will you capture data using the both the techniques? (6 marks) | CO5 | U | 10 |
|  | b. | Discuss on any FIVE mobile acquisition challenges in detail. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | 1. Explain how you will identify an android device. (6 points) 2. List and jot down the particulars required for mobile investigation. (4 points) | CO6 | A | 10 |
|  | b. | Consider that an android phone obtained for investigation is obstructed. How will you acquire data and recover missing contents? | CO6 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | 1. Explain the need of using airplane mode and stay awake technique during the isolation process. (6 marks) 2. How will you set it up in android phones? (2 marks) 3. Will it apply to button phones (not a touch screen) of 20th century? Justify why or why not. (2 marks) | CO4 | A | 10 |
|  | b. | Observe the following email header and identify the important components and write any FIVE of them and explain their functionality.  (**Note:** Please turn over the page to find the remaining question) | CO2 | An | 10 |
|  |  | User-friendly guide to email headers - Email service - Namecheap.com | | | |

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

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Explain the role of client and server in email and the role of email in investigation. |
| CO2 | Identify, analyze and investigate the malicious email. |
| CO3 | State the need to secure the e-mail service. |
| CO4 | Outline Mobile device proliferation and their functionalities. |
| CO5 | Identify and investigate data from mobile devices using forensically sound and industry standard tools. |
| CO6 | Analyze mobile devices, their backup files, and artifacts for forensic evidence. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  | 20 |  |  |  | 40 |
| CO2 | 10 | 30 |  | 10 |  |  | 50 |
| CO3 |  | 10 |  | 10 |  |  | 20 |
| CO4 | 10 |  | 20 |  |  |  | 30 |
| CO5 |  | 10 | 10 |  |  |  | 20 |
| CO6 |  |  | 20 |  |  |  | 20 |
|  | | | | | | | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| --- | --- | --- | --- |
| **Course Code** | **20CA2047** | **Duration** | **3hrs** |
| **Course Name** | **EMAIL AND MOBILE FORENSICS** | **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. | Illustrate the architecture of e-mail with its various parts | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the role of client and server in sending and receiving e-mail and in examining email messages. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Discover the importance of e-mail logs. | CO2 | A | 10 |
|  | b. | Examine the parts of SMPT headers. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Compare various e-mail forensic tools with suitable examples. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5. | a. | Examine the controls used in implementation for securing the email  Infrastructure such as user, email client, email server and email server application. | CO3 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Compare SMTP, POP3, IMAP, Mail in transit and Mail in store with suitable illustration. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Explain the evolution of mobile device forensics. | CO4 | U | 10 |
|  | b. | Compare the different types of SIM Cards. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate the server /cloud acquisitions methods. | CO5 | U | 10 |
|  | b. | Discuss the software acquisitions techniques applicable for mobile devices. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Illustrate file recovery methods for Android mobiles. | CO6 | U | 10 |
|  | b. | Explain the necessity of encrypting and decrypting data in mobile applications. | CO6 | U | 10 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Explain the role of client and server in email and the role of email in investigation. |
| CO2 | Identify, Analyze and investigate the malicious email. |
| CO3 | State the need to secure the e-mail service. |
| CO4 | Outline Mobile device proliferation and their functionalities. |
| CO5 | Identify and investigate data from mobile devices using forensically sound and industry standard tools. |
| CO6 | Analyze mobile devices, their backup files, and artifacts for forensic evidence. |

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



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| --- | --- | --- | --- |
| **Course Code** | **20CA2048** | **Duration** | **3hrs** |
| **Course Name** | **PYTHON FOR NETWORK AND SECURITY** | **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. | Explain in detail socket programming. | CO1 | U | 10 |
|  | b. | Enumerate on the Nmap scan types. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Recall on the python code for analyze network traffic. | CO2 | R | 10 |
|  | b. | Illustrate on the methods available to interact with SSH protocol. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Construct the python code to crack password. | CO3 | A | 10 |
|  | b. | Recall on the python code for key-logging. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Demonstrate man-in-the-middle attack using python. | CO3 | U | 10 |
|  | b. | Summarize on Caesar and Transposition cipher | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain in detail image classification algorithms. | CO4 | U | 10 |
|  | b. | Demonstrate object detection using python. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate the steps in image pre-processing. | CO4 | U | 10 |
|  | b. | Recall on the python code for image enhancement. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate on image metadata extraction. | CO5 | U | 10 |
|  | b. | Explain in detail the artifacts in windows forensics. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | List the tools available for forensic analysis. | CO5 | R | 10 |
|  | b. | Recall on the python code to extract email from websites. | CO6 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Enumerate on the components of Django framework. | CO6 | R | 8 |
|  | b. | Demonstrate strong encryption using python. | CO2 | U | 12 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Write socket program. |
| CO2 | Scan network and gather information. |
| CO3 | Perform ethical hacking. |
| CO4 | Encrypt and decrypt and validate images. |
| CO5 | Perform forensics analysis. |
| CO6 | Build ecommerce application. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 20 |  |  |  |  | 20 |
| CO2 | 20 | 12 |  |  |  |  | 32 |
| CO3 | 10 | 20 | 10 |  |  |  | 40 |
| CO4 | 10 | 30 |  |  |  |  | 40 |
| CO5 | 10 | 20 |  |  |  |  | 30 |
| CO6 | 18 |  |  |  |  |  | 18 |
|  | | | | | | | **180** |



**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| --- | --- | --- | --- |
| **Course Code** | **20CA2048** | **Duration** | **3hrs** |
| **Course Name** | **PYTHON FOR NETWORK AND SECURITY** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe the various authentication mechanisms used in networking. | CO2 | U | 10 |
|  | b. | Construct a program to communicate between the client and the server using socket programming. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Construct a program to analyze network traffic. | CO2 | A | 10 |
|  | b. | Compare Secure Shell and SSH protocol and write the methods used in communication using SSH protocol. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | List the advantage of using hashing and write a program to generate a hash value. | CO3 | U | 10 |
|  | b. | Describe about key logging. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe any two-cipher algorithm used in communication with example. | CO3 | U | 15 |
|  | b. | Illustrate the advantage of using search engine. | CO3 | U | 5 |
|  |  |  |  |  |  |
| 5. | a. | Explain image classification algorithms. | CO4 | U | 10 |
|  | b. | Construct a python code to rotate and transform an image. | CO4 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | List the steps in image preprocessing and the advantage of using face recognition. | CO4 | U | 10 |
|  | b. | Summarize on image restoration. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the tools used in forensic analysis. | CO5 | R | 10 |
|  | b. | Explain the role of python in digital forensics. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate on parsing log-based artifacts in Linux. | CO5 | U | 10 |
|  | b. | Recall on the python code to extract email from websites. | CO6 | R | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | List the issues in web security. | CO6 | R | 8 |
|  | b. | Explain the advantage of using cryptography and construct a program to encrypt and decrypt a text using cryptographic algorithm. | CO2 | U | 12 |

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Write socket program. |
| CO2 | Scan network and gather information. |
| CO3 | Perform ethical hacking. |
| CO4 | Encrypt and decrypt and validate images. |
| CO5 | Perform forensics analysis. |
| CO6 | Build ecommerce application. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 10 | 10 | - | - | - | 20 |
| CO2 | - | 10 | 10 | - | - | - | 20 |
| CO3 | 10 | 30 | - | - | - | - | 40 |
| CO4 | 10 | 20 | 10 | - | - | - | 40 |
| CO5 | 10 | 20 | - | - | - | - | 30 |
| CO6 | 18 | 12 | - | - | - | - | 30 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA2050** | **Duration** | **3hrs** |
| **Course Name** | **CLOUD SECURITY** | **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. | Identify the important elements of cloud computing. | CO1 | U | 10 |
|  | b. | Describe the technologies that influenced the development of cloud computing. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Summarize the characteristics of cloud computing as recommended by Open Cloud Manifesto. | CO1 | U | 10 |
|  | b. | Explain any two cloud services and their usage in real-world scenarios. | CO1 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Illustrate the cloud computing delivery models with appropriate real-time examples. | CO2 | A | 10 |
|  | b. | Examine any five IaaS services provided by Amazon and elaborate on their usage in real-time. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Analyze the breaches against the components of CIA triad. | CO2 | An | 10 |
|  | b. | Describe the major categories or patterns of cloud computing as defined by the Linthicum model. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the fundamental tenets of information security and the components of CIA triad. | CO3 | U | 10 |
|  | b. | Explain the different types of authentication. | CO4 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain any ten common threats or attacks and their impact on data security. | CO3 | A | 10 |
|  | b. | Explain the role of VPN in providing secure cloud communication. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Distinguish symmetric key cryptography from asymmetric key cryptography and discuss how PKI is used to resolve the issues in symmetric key cryptography using real-time scenarios. | CO4 | An | 10 |
|  | b. | Identify the role of intrusion detection systems in incident response and explain the techniques used for intrusion detection. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Categorize the access control models and highlight the features of each model. | CO4 | An | 10 |
|  | b. | Classify IDS into different types and discuss their detection approaches. | CO5 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Identify the various controls used for identity management. | CO6 | U | 10 |
|  | b. | Explain the features of biometric authentication. | CO6 | A | 10 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Compare the deployment models versus service models of cloud computing. |
| CO2 | Illustrate the architecture and categorize the services using cloud computing. |
| CO3 | Identify the known threats, risks, vulnerabilities and privacy issues associated with cloud-based IT services. |
| CO4 | Explain the concepts and guiding principles for designing and implementing appropriate safeguards and countermeasures for cloud-based IT services. |
| CO5 | Describe the industry security standards, regulatory mandates, audit policies, and compliance requirements for cloud-based infrastructures. |
| CO6 | State the governance in the cloud. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 30 | 10 |  |  |  | 40 |
| CO2 |  | 10 | 20 | 10 |  |  | 40 |
| CO3 |  | 10 | 10 |  |  |  | 20 |
| CO4 |  |  | 20 | 20 |  |  | 40 |
| CO5 |  | 10 |  | 10 |  |  | 20 |
| CO6 |  | 10 | 10 |  |  |  | 20 |
|  |  | 70 | 70 | 40 |  |  | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **20CA2050** | **Duration** | **3 Hrs** |
| **Course Name** | **CLOUD SECURITY** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Discover the essential characteristics of cloud computing and explain their role in cloud computing. | CO1 | U | 10 |
|  | b. | Identify the technological influences that enabled the emergence of cloud computing. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Discuss any five cloud services and their applications in real-time. | CO1 | U | 10 |
|  | b. | Evaluate the role of the following technologies in cloud computing.  i. Utility computing ii. Service Oriented Architecture. | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain the four deployment models of cloud computing and their features. | CO2 | U | 10 |
|  | b. | Explain the dimensions of the Jericho cloud cube model of cloud computing. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize the benefits of cloud computing. | CO2 | U | 10 |
|  | b. | Illustrate any five breaches against the confidentiality of information. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Determine the various eavesdropping attacks and explain their impact on data security. | CO3 | A | 10 |
|  | b. | Discuss the areas of risks associated with virtualized systems. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the following attacks on a cloud scenario with suitable examples:   1. Man-in-the-middle attack. 2. Denial of Service attacks. | CO3 | U | 10 |
|  | b. | Predict the attacks against the availability of data and explain their impact on systems. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Determine how virtual private networks can be used to provide secure communication in a cloud-based system. | CO4 | A | 10 |
|  | b. | Explain the methods used for retiring or destroying sensitive information. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Predict the risks specific to hypervisors. | CO4 | A | 10 |
|  | b. | Organize the phases of the incident response lifecycle. | CO5 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discuss the issues raised by virtualization and data location. | CO6 | U | 10 |
|  | b. | Analyze the need for IT governance in cloud computing. | CO6 | An | 10 |

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Compare the deployment models versus service models of cloud computing. |
| CO2 | Illustrate the architecture and categorize the services using cloud computing. |
| CO3 | Identify the known threats, risks, vulnerabilities and privacy issues associated with cloud-based IT services. |
| CO4 | Explain the concepts and guiding principles for designing and implementing appropriate safeguards and countermeasures for cloud-based IT services. |
| CO5 | Describe the industry security standards, regulatory mandates, audit policies, and compliance requirements for cloud-based infrastructures. |
| CO6 | State the governance in the cloud. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  | 30 |  | 10 |  |  | 40 |
| CO2 |  | 30 | 10 |  |  |  | 40 |
| CO3 |  | 30 | 10 |  |  |  | 40 |
| CO4 |  |  | 20 |  |  |  | 20 |
| CO5 |  | 10 |  | 10 |  |  | 20 |
| CO6 |  | 10 |  | 10 |  |  | 20 |
|  |  | 110 | 40 | 30 |  |  | **180** |



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| **Course Code** | **20CA2052** | **Duration** | **3hrs** |
| **Course Name** | **INFORMATION SECURITY ETHICS** | **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. | Describe ethical consideration in decision making. | CO1 | R | 10 |
|  | b. | Illustrate ethics for IT users. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the law for privacy and protection. | CO4 | R | 10 |
|  | b. | Illustrate the ethics that should be followed in copyrights. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe in detail about ethics in virtuality. | CO3 | R | 10 |
|  | b. | Explain briefly about internet and its phases. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize the history of media. | CO2 | U | 10 |
|  | b. | Extract the concept behind communication as an environment. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain in detail about the ethics followed in profession. | CO5 | R | 10 |
|  | b. | Illustrate the principles that should be followed in personnel security. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Classify the ISO code of ethics in detail. | CO5 | U | 10 |
|  | b. | Describe the process in software development. | CO6 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Identify the key issues in software development process. | CO6 | U | 10 |
|  | b. | Summarize the concepts behind the development of safety in critical systems. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain in detail about the quality management standards. | CO6 | R | 10 |
|  | b. | Illustrate the computer ethics and deontology. | CO2 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Illustrate the ethics that should be followed in social networks. | CO3 | R | 10 |
|  | b. | Summarize the communication types and briefly explain each of its types. | CO2 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Identify the issues of professional conduct in information technology. |
| CO2 | Analyses the relationship with machines, and in particular with the technological devices that we  use most in our everyday communication. |
| CO3 | Assess the impact of the privacy laws. |
| CO4 | Illustrate the issues related to intellectual property. |
| CO5 | Adapt several codes of ethics, from general to specific in nature. |
| CO6 | State the ethical issues that the software manufacturers face in making trade-offs between project  Schedules, project costs, and software quality. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  |  |  |  |  | 20 |
| CO2 | 10 | 20 |  |  |  |  | 30 |
| CO3 | 30 | 10 |  |  |  |  | 40 |
| CO4 | 20 |  |  |  |  |  | 20 |
| CO5 | 20 | 10 |  |  |  |  | 30 |
| CO6 | 20 | 20 |  |  |  |  | 40 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA3009** | **Duration** | **3hrs** |
| **Course Name** | **ADVANCED DIGITAL FORENSICS** | **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. |  | Write in detail about Linux file system. | CO1 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze the concept of cross site scripting and cookie manipulation. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 3. |  | Describe in detail about static and dynamic analysis of malware. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Explain in detail about the memory acquisition process and memory dump formats. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Recall the concepts of windows objects and pool allocations. | CO4 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Write in detail about evidence collection procedures. | CO5 | A | 20 |
|  |  |  |  |  |  |
| 7. |  | Explain in detail about forensic imaging. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Analyze the recent trends in digital forensic tools and techniques. | CO6 | A | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Describe in detail about different logs and scheduling tasks in Linux. | CO1 | U | 20 |

CO – COURSE OUTCOME BL – BLOOMS’ LEVEL

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|  | **COURSE OUTCOMES** |
| CO1 | Explain Linux file system artifacts, directory structures, and artifacts of system and user activity. |
| CO2 | Examine application forensics which includes files that require specific forensic techniques, web-based application forensics, e-mail forensics, and database forensics. |
| CO3 | Examine the various forms of malware and how to conduct malware analysis. |
| CO4 | Discover memory forensics techniques. |
| CO5 | Analyze the volatile data from host-based systems and explore the fundamental concepts of digital  imaging. |
| CO6 | Report the findings either internally or in a courtroom. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 20 |  |  |  |  | 40 |
| CO2 |  |  | 20 |  |  |  | 20 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 | 20 | 20 |  |  |  |  | 40 |
| CO5 |  | 20 | 20 |  |  |  | 40 |
| CO6 |  |  |  | 20 |  |  | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA3011** | **Duration** | **3hrs** |
| **Course Name** | **BUSINESS CONTINUITY AND DISASTER RECOVERY MANAGEMENT** | **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. | Describe the components of business plan. | CO1 | U | 10 |
|  | b. | Explain the BCMS process life cycle model (Alexander, 2009). | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Discuss the types of Disaster to consider in BCP/DR. | CO2 | U | 10 |
|  | b. | Explain the different phases of Business Continuity Planning. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe Business Impact Analysis. | CO3 | U | 10 |
|  | b. | Explain the Risk Management methodology. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss the Incidence Response plan in detail. | CO5 | U | 10 |
|  | b. | Explain the different phases of Business continuity strategy development with neat diagram. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the necessity of Crisis communication plan. | CO4 | U | 10 |
|  | b. | Explain the following   1. Backups 2. Disaster Recovery Site assessment | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe about Nmap tool. | CO5 | U | 10 |
|  | b. | Summarize the following   1. Contingency plan 2. Emergency response plan | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Find out the minimize cost for the following scenario using simplified decision tree structure   * One sub-contractor is lower-cost ($110,000 bid). We estimate however that there is a 50% chance that this contractor will be 90 days late and our contract with the main client specifies that we must pay a delay penalty of $1,000 per calendar day for every day we deliver late.   The higher-cost sub-contractor bids $140,000. We know this contractor and assess that it poses a low 10% chance of being late, and only 30 days late at that. Of course, our customer will impose on us the same $1,000 delay penalty per day for late delivery | CO6 | A | 10 |
|  | b. | Explain the different phases of penetration test. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the concepts of BCP and DRP Audits. | CO4 | U | 10 |
|  | b. | Summarize the followings   1. COBIT 2. OCTAVE | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain Quantitative and Qualitative Risk assessment methods with examples. | CO2 | A | 10 |
|  | b. | Explain the FISHBONE Diagram with example. | CO6 | A | 10 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Design a disaster recovery plan, business continuity plan for sustained organizational operations. |
| CO2 | Identify and prioritize critical business functions; determine maximum tolerable downtime and other criteria and describe concepts of risk management. |
| CO3 | Describe Business Continuity Strategy and be able to discuss incident response options and contingency planning components. |
| CO4 | Explain backup storage strategy, recovery site strategies and provide Training to test, update, assess and maintain the plan. |
| CO5 | Illustrate incident response, detection; response; reporting; recovery; remediation and understand fault tolerance requirements. |
| CO6 | Discuss the Best practices for Business continuity and disaster recovery planning. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 20 | - | - | - | - | 20 |
| CO2 | - | 30 | 10 | - | - | - | 40 |
| CO3 | - | 20 |  | - | - | - | 20 |
| CO4 | - | 30 | - | - | - | - | 30 |
| CO5 | - | 30 | - | - | - | - | 30 |
| CO6 | - | 20 | 20 | - | - | - | 40 |
| Total | - | 160 | 20 | - | - | - | **180** |



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| **Course Code** | **20CA3011** | **Duration** | **3hrs** |
| **Course Name** | **BUSINESS CONTINUITY AND DISASTER RECOVERY MANAGEMENT** | **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. | Describe the components of business plan. | CO1 | U | 10 |
|  | b. | Explain the BCMS process life cycle model (Alexander, 2009). | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Discuss the types of disaster to consider in BCP/DR. | CO2 | U | 10 |
|  | b. | Explain the different phases of Business Continuity Planning. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe Business Impact Analysis. | CO3 | U | 10 |
|  | b. | Explain the Risk Management methodology. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss the Incidence Response plan in detail. | CO5 | U | 10 |
|  | b. | Explain the different phases of Business continuity strategy development with neat diagram. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the necessity of Crisis communication plan. | CO4 | U | 10 |
|  | b. | Explain the following   1. Backups. 2. Disaster Recovery Site assessment. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe about Nmap tool. | CO5 | U | 10 |
|  | b. | Summarize the following   1. Contingency plan. 2. Emergency response plan. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain Risk Management Framework developed by the National Institute of Standards and Technology. | CO6 | U | 10 |
|  | b. | Explain the different phases of penetration test. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the concepts of BCP and DRP Audits. | CO4 | U | 10 |
|  | b. | Summarize the followings   1. COBIT 2. OCTAVE | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain Quantitative and Qualitative Risk assessment methods with examples. | CO2 | An | 10 |
|  | b. | Explain the FISHBONE Diagram with example. | CO6 | An | 10 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Design a disaster recovery plan, business continuity plan for sustained organizational operations. |
| CO2 | Identify and prioritize critical business functions; determine maximum tolerable downtime and other criteria and describe concepts of risk management. |
| CO3 | Describe Business Continuity Strategy and be able to discuss incident response options and contingency planning components. |
| CO4 | Explain backup storage strategy, recovery site strategies and provide Training to test, update, assess and maintain the plan. |
| CO5 | Illustrate incident response, detection; response; reporting; recovery; remediation and understand fault tolerance requirements. |
| CO6 | Discuss the Best practices for Business continuity and disaster recovery planning. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 20 | - | - | - | - | 20 |
| CO2 | - | 30 | 10 | - | - | - | 40 |
| CO3 | - | 20 |  | - | - | - | 20 |
| CO4 | - | 30 | - | - | - | - | 30 |
| CO5 | - | 30 | - | - | - | - | 30 |
| CO6 | - | 30 | 10 | - | - | - | 40 |
| Total | - | 150 | 30 | - | - | - | **180** |



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| **Course Code** | **20CA3012** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE SECURITY MANAGEMENT** | **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. | Identity and explain the components of data modeling. | CO1 | U | 10 |
|  | b. | Illustrate ER data model in detail. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Elaborate normalization with merits and demerits for all types of normal form and with explain with example. | CO1 | R | 10 |
|  | b. | Distinguish the different types of data models with example. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Create a database for storing employee details and write the queries for the following   * Display the members whose salary is greater than 50,000 * Calculate the total salary with 5% hra, 20% da and 10% ta and pf 10% | CO2 | C | 10 |
|  | b. | Define Clustering and explain with example. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss about datawarehouse with advantages and disadvantages. | CO2 | U | 10 |
|  | b. | Analyze the way to retrieve private information. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Identify the ways to preserve privacy of location based queries. | CO3 | U | 10 |
|  | b. | Explain data leakage and list out the solution to prevent data leakage. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Point out the differences between grant and revoke in database. | CO4 | An | 10 |
|  | b. | Implement authorization with roles and groups. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Assess the alternatives to backup and recovery. | CO5 | E | 10 |
|  | b. | Elucidate database security model. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Discuss about encryption. | CO5 | U | 10 |
|  | b. | Elucidate Backup and recovery of data. | CO5 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discuss about database auditing models. | CO6 | U | 10 |
|  | b. | Mention some disaster prevention checklist. | CO6 | R | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Describe database concepts. |
| CO2 | Explain operational threats and vulnerable points of accessing and assess them. |
| CO3 | Propose plan to prevent data leakage and data breach. |
| CO4 | Protect personally identifiable information and other sensitive data from hackers. |
| CO5 | Devise the schedule for database backup. |
| CO6 | Develop security policy and perform database auditing. |

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



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| --- | --- | --- | --- |
| **Course Code** | **20CA3014** | **Duration** | **3hrs** |
| **Course Name** | **INFORMATION SECURITY GOVERNANCE, RISK AND COMPLIANCE** | **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. | Describe about GRC in detail. | CO1 | U | 10 |
|  | b. | Explain about the following types of governance in detail.   1. Enterprise governance 2. IT governance 3. Corporate governance. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Describe about the GRC framework and its maturity model. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | State the common risk assessment mistakes and how will you avoid them. | CO3 | U | 10 |
|  | b. | Summarize the gap analysis. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate the open group in detail. | CO3 | U | 10 |
|  | b. | Demonstrate the framework of information security management in ITIL. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. |  | Discuss about security policies. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain about SOX act. | CO5 | U | 10 |
|  | b. | Summarize the Payment Card Industry Data Security Standard. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Discuss about the personal management. | CO5 | U | 10 |
|  | b. | Analyze about the quality management. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Describe about the information security management practices in detail. | CO6 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Paraphrase about the HIPAA. | CO5 | An | 20 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Explain Information Security Governance, Risk & Compliance. |
| CO2 | Develop an information security strategy. |
| CO3 | Determine and manage acceptable risk and select the appropriate, risk-based controls that align to the laws and frameworks. |
| CO4 | Create a security-aware culture. |
| CO5 | Discuss the existing and emerging laws and regulations impacting the organization. |
| CO6 | Prepare for and leverage internal and external audits to enhance processes. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  | 40 |  |  |  |  | 40 |
| CO2 |  | 10 |  |  |  |  | 10 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  | 30 |  |  |  |  | 30 |
| CO5 |  | 30 |  | 30 |  |  | 60 |
| CO6 |  | 20 |  |  |  |  | 20 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA3015** | **Duration** | **3hrs** |
| **Course Name** | **INTERNET OF THINGS SECURITY** | **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. |  | Describe in detail IoT communication protocols. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Summarize on countermeasures to IoT attacks. | CO1 | U | 14 |
|  | b. | Enumerate on secure device disposal and zeroization. | CO2 | R | 6 |
|  |  |  |  |  |  |
| 3. |  | Enumerate on guide to performing PIA. | CO4 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize on authorization and access control. | CO3 | U | 8 |
|  | b. | Explain in detail IoT security challenges. | CO2 | U | 12 |
|  |  |  |  |  |  |
| 5. | a. | Explain Incident detection analysis. | CO5 | R | 10 |
|  | b. | Illustrate on the role of cloud in IoT | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate on cloud based security for IoT. | CO5 | U | 12 |
|  | b. | Enumerate on IoT forensics. | CO5 | R | 8 |
|  |  |  |  |  |  |
| 7. | a. | Summarize on edge analytic. | CO6 | U | 8 |
|  | b. | Differentiate fog and cloud computing. | CO6 | An | 4 |
|  | c. | Mention the big data tools and technologies. | CO6 | R | 8 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Illustrate on cryptography role in IoT. | CO3 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain in detail data analytics for IoT. | CO6 | U | 10 |
|  | b. | Summarize on machine learning for IoT. | CO6 | U | 10 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Summarize IoT system. |
| CO2 | Design IoT devices. |
| CO3 | Develop identity and access management system. |
| CO4 | Implement IoT privacy. |
| CO5 | Devise Cloud base IoT devices. |
| CO6 | Outline Fog computing. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 | - | 34 | - | - | - | - | 34 |
| CO2 | 6 | 12 | - | - |  |  | 18 |
| CO3 | - | 28 | - | - | - | - | 28 |
| CO4 | 20 | - | - | - |  |  | 20 |
| CO5 | 18 | 22 | - | - | - | - | 40 |
| CO6 | 8 | 28 | - | 4 | - | - | 40 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA3016** | **Duration** | **3hrs** |
| **Course Name** | **ARTIFICIAL INTELLIGENCE SECURITY** | **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. | Relate how AI is used in healthcare. | CO1 | U | 10 |
|  | b. | Illustrate how AI is used in business. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Compare various artificial intelligence approaches with example. | CO1 | U | 10 |
|  | b. | Compare the types of AI threat model of Learning | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe the evolution of AI. | CO2 | U | 10 |
|  | b. | Show the construction of decision tree with example | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Define botnet? Describe the mechanisms in identifying botnet? | CO3 | R | 20 |
|  |  |  |  |  |  |
| 5. |  | Explain the different kinds of network anomaly detection techniques. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain about biometric authentication with facial recognition. | CO4 | U | 10 |
|  | b. | Discuss in detail about the user authentication with keystroke recognition. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 7. |  | Illustrate with real time examples about data breaches and security threats. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe about the credit card fraud handling using machine learning. | CO5 | U | 10 |
|  | b. | Show how we can provide the solution to fraud detection and prevention using machine learning. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Illustrate the impacts of cyber-attacks in digital environment. | CO6 | An | 10 |
|  | b. | Explain the ontology of digital forensics. | CO6 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Outline the fundamental concepts of artificial intelligence. |
| CO2 | Explain the different approaches of automated learning in the field of cyber security. |
| CO3 | Describe the current level of interconnection between different devices. |
| CO4 | State the important role in terms of the protection of sensitive user related information. |
| CO5 | Identify the security attacks and data breaches. |
| CO6 | Discuss strategic defence mechanisms for malware, addressing cybercrime, and assessing vulnerabilities to yield proactive rather than reactive |

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



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| --- | --- | --- | --- |
| **Course Code** | **20CA3017** | **Duration** | **3hrs** |
| **Course Name** | **ECONOMIC OFFENCES** | **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. |  | Illustrate the economic offences committed by any four economic offenders in India in the recent past. Analyze the loopholes exploited by them in committing the offences. | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Analyze any two case studies related to transnational economic offences. | CO1 | An | 10 |
|  | b. | Explain why digitization leads to a rise of economic offences around the globe. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | If you are a food quality control officer, analyze the measures that you would take to maintain food quality by examining the problems created by food adulteration in the society. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss why money laundering is a serious economic offence by analyzing any two case studies on the same. | CO2 | U | 10 |
|  | b. | Explain the common forms of trafficking and their negative impact in society. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the frauds related to stock market manipulation and analyze a case study related to the same. | CO3 | U | 10 |
|  | b. | Using a mind map, analyze the crimes related to cultural objects and idol theft. | CO3 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Categorize the types of intellectual property rights and outline how such rights are violated with appropriate examples. | CO3 | An | 20 |
|  |  |  |  |  |  |
| 7. | a. | Explain the application of digital technology in economy and business. | CO4 | U | 10 |
|  | b. | As a cybersecurity professional and cyber forensic expert discuss the ways in which you can detect and prevent of economic offences. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Justify that digital technology has been abused in various ways for committing economic offences. | CO5 | E | 10 |
|  | b. | Summarize the types of banking frauds committed in society. | CO4 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Choose any three case studies of economic offences and highlight the  loopholes in the system that enabled the offender in committing the offence. Sketch a probable solution for detecting or preventing the offences. | CO6 | A | 20 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concepts of economic offences. |
| CO2 | Outline the types and forms of economic offences. |
| CO3 | State the modus operandi of committing economic offences. |
| CO4 | Describe the economic offences in the digital space. |
| CO5 | Outline the laws relating to economic offences in India. |
| CO6 | Apply best practices to prevent and detect economic offences and discuss the role of an information security professional. |

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



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| --- | --- | --- | --- |
| **Course Code** | **20CA3020** | **Duration** | **3hrs** |
| **Course Name** | **PYTHON FOR CYBER SECURITY** | **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. | Explain the array operations with example. | CO1 | U | 10 |
|  | b. | Illustrate how missing values are handled by using pandas library. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Compare series and data frame of pandas library. Write the steps involved in data representation. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Explain the various type of charts used in matplotlib library. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Encrypt the word “python” with key=10 encrypt and decrypt the message using additive cipher. | CO4 | A | 10 |
|  | b. | Construct a program to communicate between the client and the server using socket programming. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | Write the advantage using hashing. Construct a program to generate hash value for the given input string. | CO4 | A | 5 |
|  | b. | Describe the different modes of operation. | CO4 | U | 15 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Construct a program to communicate between the client and the server using socket programming. | CO4 | A | 10 |
|  | b. | Explain about penetration testing and the types of approaches used in penetration testing. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 7. |  | Explain penetration testing and the tools used to perform the same. | CO6 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the anatomy of HTTP Request and the usage of requests library. | CO5 | A | 10 |
|  | b. | Construct a program to extract the content of the web page with its status code and server header information. | CO5 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Describe SQL injection with real time example. | CO3 | U | 10 |
|  | b. | Explain the types of spoofing attack. | CO3 | U | 10 |

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

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|  | **COURSE OUTCOMES** |
| CO1 | Use Python in data analysis using NumPy, IPython and Pandas. |
| CO2 | Gain knowledge on Python’s role in data preparation, data visualization and statistical computations. |
| CO3 | Explain the Web Application Security, which includes Cross-Site Scripting Attacks, Cross-Site Request Forgery, SQL Injection Attacks. |
| CO4 | Describe crypto primitives and their applications. |
| CO5 | Outline the process behind web pentesting. |
| CO6 | Discuss the role ethical hacking plays in providing secure and robust networks. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  |  |  |  |  |  |  |
| CO2 |  |  |  |  |  |  |  |
| CO3 |  |  |  |  |  |  |  |
| CO4 |  |  |  |  |  |  |  |
| CO5 |  |  |  |  |  |  |  |
| CO6 |  |  |  |  |  |  |  |
|  | | | | | | | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

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| --- | --- | --- | --- |
| **Course Code** | **20CA3020** | **Duration** | **3hrs** |
| **Course Name** | **PYTHON FOR CYBER SECURITY** | **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. | List the advantages of using numpy and explain the array operations. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Compare series and dataframe. Explain how missing values are handled using pandas library. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe various types of charts used in matplotlib library. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the types of cryptography and encrypt the word “Secure” with key =7 using multiplicative cipher. | CO4 | A | 10 |
|  | b. | Construct a program to communicate between the client and the server using socket programming. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe the different modes of operation with suitable example. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain HTTP protocol and the anatomy of HTTP Request | CO5 | U | 10 |
|  | b. | Explain the types of penetration testing. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain web application penetration testing and the tools used to perform the same. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain SQL injection and hashing. | CO3 | A | 10 |
|  | b. | Construct a program to extract the content of the web page with its status code and server header information. | CO5 | A | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain about cross site scripting with a real time example. | CO3 | U | 10 |
|  | b. | Explain the types of cyber-attacks. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | use Python in data analysis using NumPy, IPython and Pandas. |
| CO2 | gain knowledge on Python’s role in data preparation, data visualization and statistical computations. |
| CO3 | explain the Web Application Security, which includes Cross-Site Scripting Attacks, Cross-Site Request Forgery, SQL Injection Attacks. |
| CO4 | describe crypto primitives and their applications. |
| CO5 | outline the process behind web pentesting. |
| CO6 | discuss the role ethical hacking plays in providing secure and robust networks. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 40 | - | - | - | - | 40 |
| CO2 | - | 20 | - | - | - | - | 20 |
| CO3 | - | 30 | 10 | - | - | - | 40 |
| CO4 | - | 20 | 20 | - | - | - | 40 |
| CO5 | - | 10 | 10 | - | - | - | 20 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **20CA3022** | **Duration** | **3hrs** |
| **Course Name** | **SECURITY IN THE CLOUD** | **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. |  | Organize the standards of cloud computing as defined by the NIST cloud computing architecture focusing on service models, deployment models, essential characteristics, and major actors. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Summarize the technologies used in network-based systems that led to the emergence of cloud computing. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Illustrate the virtualization of CPUs, memory and I/O devices. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Categorize virtualization into different types and discuss the technologies used in each type. | CO2 | An | 10 |
|  | b. | Identify the challenges in multicore virtualization and discuss the possible solutions. | CO2 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe the four major design goals of cloud platform and discuss the challenges in implementation and the possible solutions. | CO3 | U | 10 |
|  | b. | Explain Google app engine and its features. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain how cloud providers manage resources using the intercloud model. | CO3 | U | 10 |
|  | b. | Discuss the salient features of the services provided by Amazon AWS. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Discuss the system issues in a parallel and distributed programming environment. | CO4 | U | 10 |
|  | b. | Explain the phases of risk management framework. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Flipkart has a database containing the date-wise sales amount for each city for the year 2020. Compute the total sales of each city using map reduce technique. | CO4 | A | 10 |
|  | b. | Analyze any two case studies of security issues in cloud computing and discuss the risk mitigation strategies. | CO5 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Discuss the features of different forms of authentication schemes and choose the best method of authentication. Justify why you feel that the above method is the best one. | CO6 | E | 20 |

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

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Compare deployment models versus service models of cloud computing. |
| CO2 | Apply suitable virtualization concept. |
| CO3 | Design and Compute the Storage Clouds. |
| CO4 | Use Programming model. |
| CO5 | Debate the security risks associated with the cloud. |
| CO6 | Discuss the governance and the legal issues in the cloud. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 20 |  | 20 |  |  | 40 |
| CO2 |  |  | 20 | 20 |  |  | 40 |
| CO3 |  | 40 |  |  |  |  | 40 |
| CO4 |  | 10 | 10 |  |  |  | 20 |
| CO5 |  | 10 |  | 10 |  |  | 20 |
| CO6 |  |  |  |  | 20 |  | 20 |
|  |  | 80 | 30 | 50 | 20 |  | **180** |

**Graphical user interface, application

Description automatically generated with medium confidence**

**SUPPLEMENTARY EXAMINATION – JUNE 2023**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **20CA3022** | **Duration** | **3 Hrs** |
| **Course Name** | **SECURITY IN THE CLOUD** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Classify the system model designs for distributed and cloud computing. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Interpret the role of major actors of cloud computing with the help of real-time scenarios. | CO1 | A | 10 |
|  | b. | Categorize the service models of cloud computing. | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. |  | Classify the levels of virtualization implementation. | CO2 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss the various strategies used for resource management in clusters. | CO2 | U | 10 |
|  | b. | Classify the virtualization architecture based on the position of the virtualization layer and discuss the features of each class. | CO2 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Represent the layered cloud architecture design and highlight its salient features. | CO3 | U | 10 |
|  | b. | Illustrate the components of Hadoop and explain its application in parallel and distributed programming. | CO3 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Discuss the challenges faced in designing cloud architecture. | CO3 | U | 10 |
|  | b. | Predict the suitability of HDFS and Map reduce model for solving problems related to big data processing. | CO3 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Amazon wants to calculate its total sales city-wise for the year 2022. The database contains the details of daily sales of each city. Apply map reduce model to simplify the computation of city-wise total sales. | CO4 | A | 10 |
|  | b. | Determine any two top security risks associated with cloud computing and analyze the risk mitigation strategies. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Classify the application architectures for mapping applications to parallel and distributed systems. | CO4 | An | 10 |
|  | b. | Discuss autonomic computing and its features. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Evaluate the issues in symmetric key cryptography and discuss how PKI is used to resolve them. | CO6 | An | 20 |

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Compare deployment models versus service models of cloud computing. |
| CO2 | Apply suitable virtualization concept. |
| CO3 | Design and Compute the Storage Clouds. |
| CO4 | Use Programming model. |
| CO5 | Debate the security risks associated with the cloud. |
| CO6 | Discuss the governance and the legal issues in the cloud. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| **CO / P** | **R** | **U** | **A** | **An** | **E** | **C** | **Total** |
| CO1 |  |  | 10 | 30 |  |  | 40 |
| CO2 |  | 10 |  | 30 |  |  | 40 |
| CO3 |  | 20 | 20 |  |  |  | 40 |
| CO4 |  |  | 10 | 10 |  |  | 20 |
| CO5 |  | 10 | 10 |  |  |  | 20 |
| CO6 |  |  |  | 20 |  |  | 20 |
|  |  | 40 | 50 | 90 |  |  | **180** |



|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **21CA2001** | **Duration** | **3hrs** |
| **Course Name** | **PROGRAMMING LOGIC AND DESIGN** | **Max. Marks** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain flowchart with an example. | CO1 | U | 10 |
|  | b. | Explain connector symbol with an example. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain string comparison with an example. | CO2 | U | 10 |
|  | b. | Illustrate logical AND operator with an example. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain module call with an example. | CO3 | U | 10 |
|  | b. | Explain recursion with an example. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Define array and explain one dimensional array with an example. | CO4 | R | 10 |
|  | b. | Explain the concept of files. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Compare Object Oriented Programming and Procedural programming. | CO5 | U | 10 |
|  | b. | Explain polymorphism with an example. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Summarize the steps involved in designing the user interface for a Graphical User Interface program. | CO6 | U | 10 |
|  | b. | Explain the use of component names and properties in GUI. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain while loop with an example. | CO2 | U | 10 |
|  | b. | Explain input validation with an example. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain if-then-else-if statement with an example. | CO2 | U | 10 |
|  | b. | Define access specifiers and explain its types. | CO5 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Compare RAM and ROM. | CO1 | U | 10 |
|  | b. | Explain global variable with an example. | CO3 | U | 10 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the basics of computers and programming. |
| CO2 | Solve problems using programming control structures. |
| CO3 | Analyze problems and represent solutions using modular programming. |
| CO4 | Organize and process data using different data structures. |
| CO5 | Applying programming skills to solve problems. |
| CO6 | Illustrate the importance of modern programming concepts. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | 50 | - | - | - | - | 50 |
| CO3 | - | 30 | - | - | - | - | 30 |
| CO4 | 10 | 10 | - | - | - | - | 20 |
| CO5 | 10 | 20 | - | - | - | - | 30 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |



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| --- | --- | --- | --- |
| **Course Code** | **21CA2002** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF WEB DESIGNING** | **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. | Describe the features of web browser. | CO1 | U | 10 |
|  | b. | Define HTTP. Illustrate the architecture of HTTP. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Identify two types of lists used in html. Give suitable examples. | CO2 | A | 10 |
|  | b. | Classify different types of HTML frames with their syntax. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain image manipulation strategies. | CO3 | U | 10 |
|  | b. | Enumerate placeholder and autofocus attributes with example. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Define datatype. Identify the various types of javascript datatypes. | CO4 | U | 10 |
|  | b. | Summarize the javascript events. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe the features of JQuery. | CO5 | U | 10 |
|  | b. | Cite the syntax of JQuery. Extend the steps to add JQuery with HTML. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the benefits of bootstrap. | CO6 | U | 10 |
|  | b. | Define bootstrap grid and illustrate the structure of bootstrap grid. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain different types of effects in JQuery. | CO5 | U | 10 |
|  | b. | Define HTML and discuss its applications. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain CSS text effects and transition. | CO3 | U | 10 |
|  | b. | Construct an HTML program to design a webpage for adding your portfolio using CSS. | CO3 | C | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Construct a program using HTML frame concept to design a webpage for online shopping. | CO2 | C | 10 |
|  | b. | Distinguish between HTML 4 and HTML 5. | CO3 | U | 10 |

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

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Summarize web architecture and web services. |
| CO2 | Develop static and dynamic web applications. |
| CO3 | Develop web applications. |
| CO4 | Apply the knowledge of HTML and javascript Programming to design interactive web pages. |
| CO5 | Build CSS to visually format web pages and applications. |
| CO6 | Acquire knowledge about how to create a bootstrap framework. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | 10 | 10 | - | - | 10 | 30 |
| CO3 | 10 | 30 | - | - | - | 10 | 50 |
| CO4 |  | 20 | - | - | - | - | 20 |
| CO5 |  | 30 | - | - | - | - | 30 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |