Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_

****

**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **18MA2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FOUNDATIONS OF MATHEMATICS AND STATISTICS** | **Max. Marks :** | **100** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | |
| 1. | Define differentiation. | CO4 | 1 |
| 2. | State Euler’s theorem. | CO4 | 1 |
| 3. | Find dy/dx of the following. (i) sin x (ii) cos-1x | CO4 | 1 |
| 4. | Differentiate the following function eq0015Memptyemptyempty | CO4 | 1 |
| 5. | emptyemptyempty | CO4 | 1 |
| 6. | Differentiate following function | CO4 | 1 |
| 7. | Write down the condition for an increasing and decreasing function. | CO4 | 1 |
| 8. | Write down the condition for maxima and minima. | CO4 | 1 |
| 9. | Integrate the following. (1)  (2) | CO4 | 1 |
| 10. |  | CO4 | 1 |
| 11. | Define mathematical probability. | CO3 | 1 |
| 12. | Define random variable. | CO3 | 1 |
| 13. | What are mutually exclusive events? | CO3 | 1 |
| 14. | State addition theorem on probability. | CO3 | 1 |
| 15. | Define standard normal distribution. | CO5 | 1 |
| 16. | Write down the properties of probability mass function. | CO5 | 1 |
| 17. | Define Binomial distribution. | CO5 | 1 |
| 18. | Fill in the blanks.  P(φ) = \_\_\_\_\_\_\_\_.  P() = 1 – \_\_\_\_\_\_\_\_. | CO3 | 1 |
| 19. | A bag contains 7 apples, 6 oranges and 5 guavas. 2 fruits are drawn at random. Find the probability that they will both be apples. | CO3 | 1 |
| 20. | What is the probability of getting 53 Sundays when a leap year selected at random? | CO3 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Explain in detail the rules of differentiation. | CO4 | 5 |
| 22. | Define successive differentiation with example. | CO4 | 5 |
| 23. | What are the properties of binomial coefficients? | CO4 | 5 |
| 24. | Find the Maxima or Minima if any of x3+2x2-4x-8 | CO4 | 5 |
| 25. | Find the maxima (or) minima if any of the following function. | CO4 | 5 |
| 26. | Integrate the following. | CO4 | 5 |
| 27. | Verify Euler’s theorem for the following homogeneous functions.  (i) u = (ii) u = x3 + y3 –x2 y + xy2 | CO4 | 5 |
| 28. | State the axioms for probability. | CO3 | 5 |
| 29. | How will you fit the Binomial distribution? | CO5 | 5 |
| 30. | Define Normal distribution. Also give its properties. | CO5 | 5 |
| 31. | How will you construct of frequency distribution? | CO3 | 5 |
| 32. | Describe about ogives and its types. | CO3 | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | | |
| 33. |  | Differentiate the following function y=f(x) with respect to x. | CO4 | 15 |
|  |  |  |  |  |
| 34. | a. | Integrate the following. | CO4 | 5 |
| b. | Find the area between the line y = x + 1 and the curve y = x2 – 1. | CO4 | 10 |
|  |  |  |  |  |
| 35. | a. | Explain in detail the various types of diagrams with suitable illustrations. | CO2 | 10 |
| b. | Draw frequency polygon and curve to the following data.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Seed yield g(X) | 2.5-3.5 | 3.5-4.5 | 4.5-5.5 | 5.5-6.5 | 6.5-7.5 | 7.5-8.5 | 8.5-9.5 | 9.5-10.5 | | No. of plants | 4 | 6 | 10 | 26 | 24 | 15 | 10 | 5 | | CO2 | 5 |