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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **FOUNDATIONS OF MATHEMATICS AND STATISTICS** | **Duration :** | **3hrs** |
| **Sub. Name :** | **17MA1006** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Marks** |
|  | | **PART-A(20X1=20 MARKS)** | | |
| 1. | The condition for which the binomial expansion to be valid is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO1 | 1 |
| 2. | Write the expansion of log2. | | CO1 | 1 |
| 3. | Find the value of in . | | CO1 | 1 |
| 4. | Expand  in terms of . | | CO1 | 1 |
| 5. | . | | CO1 | 1 |
| 6. | If, find . | | CO1 | 1 |
| 7. | Evaluate | | CO1 | 1 |
| 8. |  | | CO1 | 1 |
| 9. | If A and B are mutually exclusive events, then . | | CO3 | 1 |
| 10. | A coin is tossed two times, then n(S)=\_\_\_\_\_\_\_\_\_ . | | CO3 | 1 |
| 11. | If A is any event, then = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO3 | 1 |
| 12. | Write down the probability of an impossible event. | | CO3 | 1 |
| 13. | The standard normal variate Z =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | 1 |
| 14. | Find the mean of the binomial distribution for n=10 and p = . | | CO4 | 1 |
| 15. | Write down the probability function P(x) of a Poisson distribution. | | CO4 | 1 |
| 16. | The total area bounded by the normal curve and x- axis is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO4 | 1 |
| 17. | If the sample size is greater than 30, then the sample is known as\_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | 1 |
| 18. | Write down the standard value of Z for two-tailed test at 5% level of significance. | | CO6 | 1 |
| 19. | The statistical constants of the sample in a population are known as\_\_\_\_\_\_\_\_\_\_\_\_. | | CO5 | 1 |
| 20. | =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | CO6 | 1 |

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|  | | **PART B(10 X 5= 50 MARKS)**  **(Answer any 10 from the following)** | | |
| 21. | Split into partial fractions. | | CO1 | 5 |
| 22. | Find the sum of the series. | | CO1 | 5 |
| 23. | If y=  find | | CO1 | 5 |
| 24. | Evaluate . | | CO1 | 5 |
| 25. | A statistical problem is given to two students . The chances of solving it are 0.8 and 0.9 respectively. What is the probability that the problem is solved? | | CO3 | 5 |
| 26. | If P(A) = 0.4, P(B) = 0.7 and P(A∩B) =0.3, Find . | | CO3 | 5 |
| 27. | Ten coins are thrown simultaneously . Find the probability of getting exactly 7heads? | | CO4 | 5 |
| 28. | A random variable X is normally distributed with mean 12 and standard deviation 4. Find P(x≥20). | | CO4 | 5 |
| 29. | A sample of size of 600 persons selected at random from a large city shows that the percentage of males in the sample is 53. It is believed that the ratio of males to the total propotion in the city is. Test whether the belief is confirmed by the observation. | | CO6 | 5 |
| 30. | The mean produce of wheat of a sample of 100 fields comes to 200kg per acer and another sample of 150 fields gives the mean of 220kg. Assuming the standard deviation of field at 11kgs for the universe , test if there is a significant difference between the means of the samples. | | CO5 | 5 |
| 31. | The following table gives a classification of a sample of 160 plants of their flower colour and flatness of leaf .   |  |  |  | | --- | --- | --- | |  | Flat leaves | Curled leaves | | White flower | 99 | 36 | | Red flower | 20 | 5 |   Test whether the flower colour is independent of flatness of leaf. | | CO5 | 5 |
| 32. | A sample of 20 items has mean 42 units and standard deviation 5 units. Test the hypothesis that it is a random sample from a normal population with mean 45 units. | | CO6 | 5 |

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|  | | **PART C(2 X 15= 30 MARKS)**  **(Answer any 2 from the following)** | | | |
| 33. | a. | | Prove that | CO1 | 8 |
| b. | | Find the sum to infinity the series | CO1 | 7 |
| 34. | a. | | Find the maxima / minima of the following function f(x) = 2x3 – 3x2–36x +10 | CO2 | 8 |
| b. | | Fit a binomial distribution to the given data and calculate the theoretical frequencies.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | f | 5 | 18 | 28 | 12 | 7 | 6 | 4 | | CO4 | 7 |
| 35. | a. | | In a factory producing razor blades, there is a small chance of  for any blade to be defective. The blades are in packets of 10. Use poission distribution to calculate the approximate number of packets containing (i) no defective (ii) one defective (iii) two defective in a consignment of 10,000 packets. | CO4 | 8 |
| b. | | If A and B alternately throw a pair of dice. A wins if he throws 6 before B throws 7 and B wins if he throws 7 before A throws 6. If A begins the game, find the chance of his winning. | CO3 | 7 |