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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14MA3003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Foundations of Mathematics and Statistics** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Find the greatest binomial coefficient in the expansion of | CO1 | 10 |
| b. | Find the first term with negative coefficient in the expansion of . | CO1 | 5 |
| c. | Find the sum to infinity of the series | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Sum the series | CO1 | 10 |
| b. | Find the coefficient of of | CO1 | 10 |
| 3. | a. | Evaluate (i)  (ii) | CO1 | 10 |
|  | b. | Find the differential of (log x/sin x) | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | find the value of . | CO2 | 10 |
|  | b. | A window has the form of a rectangle surmounted by a semicircle. If the perimeter is 40 ft., Find its dimensions so that the greatest amount of light may be admitted | CO2 | 10 |
| 5. | a. | Evaluate (i)  (ii)  (iii) | CO2 | 15 |
|  | b. | Evaluate | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Derive the integration by parts formula. Using the integration by parts, evaluate  . | CO2 | 10 |
|  | b. | Evaluate using Bernoulli’s formula (i)  (ii) | CO2 | 10 |
| 7. | a. | Out of 800 families with 5 children each, how many would you expect to have  i) 3 boys ii) 5 girls iii) either 2 or 3 boys? Assume equal probabilities for boys and girls | CO3 | 10 |
|  | b. | If in a lot of 500 solenoids 25 are defective. Find the probability of 0,1,2,3 defective solenoids in a random sample of 20 solenoids | CO3 | 5 |
|  | c. | The weekly wages of 1000 workers are normally distributed around a mean of Rs 70 with SD of Rs 5. Estimate the number of workers whose weekly wages will be (i) between RS 69 and Rs 72 (ii) less than Rs 69 (iii) More than Rs 72 | CO3 | 5 |
| (OR) | | | | |
| 8. | a. | Fit a Poisson distribution to the set of observations :     |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | f | 103 | 143 | 98 | 42 | 8 | 4 | 2 | 0 | 0 | 0 | 0 | | CO3 | 10 |
|  | b. | Fit a Binomial distribution to the following data:     |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | f | 2 | 10 | 38 | 106 | 188 | 257 | 226 | 128 | 59 | 7 | 3 | | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat eaters are equally popular in this state at 1% level of significance? | CO3 | 10 |
|  | b. | A machinist is making engine parts with axle diameters of 0.700 inch. A random sample of 10 parts shows a mean diameter of 0.742 inches with S.D of 0.040 inch. Compute the statistics you would use to test whether the work is meeting the specification | CO3 | 10 |

ALL THE BEST