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 – April/May – 2017**

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| **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 term in the expansion of  when | CO1 | 10 |
| b. | Sum the series to infinity | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Sum the series | CO1 | 10 |
| b. | Evaluate (i)  (ii) | CO1 | 10 |
| 3. | a. | Find the maxima and minima values of | CO1 | 10 |
|  | b. | Derive the product rule of differentiation. Also find the value of . | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Derive the quotient rule of differentiation. Also find the value of . | CO2 | 10 |
|  | b. | A window has the form of a rectangle surmounded 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 | CO2 | 10 |
| 7. | a. | In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and S.D. | CO3 | 5 |
|  | b. | A certain screw making machine produces on average of 2 defective screws out of 100 and packs them in boxes of 500. Find the probability that a box contains 15 defective screws | CO3 | 5 |
|  | c. | In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and S.D of 60 hours. Estimate the number of bulbs likely to burn for (i) more than 2150 hours (ii) less than 1950 hours (iii) more than 1920 hours but less than 2160 hours. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Fit a Poisson distribution to the set of observations :   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | | f | 122 | 60 | 15 | 2 | 1 | | CO3 | 10 |
|  | b. | Fit a Binomial curve to the following distribution:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 2 | 4 | 6 | 8 | 10 | | f | 1 | 4 | 6 | 4 | 1 | | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | A sample 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 population in the city is . Test whether the belief is confirmed by the observation | CO3 | 5 |
|  | b. | The means of large samples of sizes 2000 and 1000 are 68 and 67.5 respectively. Can the samples be regarded as drawn from the same population of S.D 2.25. | CO3 | 5 |
|  | c. | Given the following contingency table for hair color and eye color. Is there good association between the two.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  | Fair | Brown | Black | Total | | Eye Color | Blue | 15 | 5 | 20 | 40 | | Grey | 20 | 10 | 20 | 50 | | Brown | 25 | 15 | 20 | 60 | | Total | 60 | 30 | 60 | 150 | | CO3 | 10 |

ALL THE BEST