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 :** | **14MA2008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PROBABILITY AND STATISTICS** | **Max. marks :** | **100** |

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

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Calculate the Mean, Median and Mode for the following data:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Class Interval | 0 -10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | | Frequency | 6 | 20 | 44 | 26 | 3 | 1 | | CO2 | 10 |
| b. | Find the quartile deviation for the following data:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Marks | 0 -5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | | No of Students | 4 | 6 | 8 | 12 | 7 | 2 | | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | Find the correlation coefficient from the following data:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | X | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 | | Y | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 | | CO2 | 10 |
| b. | Find the lines of regression for the following data:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | Y | 9 | 8 | 10 | 12 | 11 | 13 | 14 | | CO2 | 10 |
| 3. | a. | The chances of A, B and C becoming the general manager of a certain company are in the ratio 4:2:3. The probabilities that the bonus scheme will be introduced in the company,if A,B and C become general manager are 0.3,0.7 and 0.8 respectively. If the bonus scheme has been introduced, what is the probability that A has been appointed as general manager? | CO1 | 10 |
| b. | In a shooting test the probability of hitting the target is  for A,  for B and for C. If all of them fire at the target, find the probability that (i) none of them hits the target (ii) atleast one of them hits the target (iii) exactly two of them hit the target. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | A continuous random variable X has the probability density function  . Find (i) the value of (ii) mean and variance (iii) P(x<4) | CO1 | 10 |
|  | b. | For the bivariate probability distribution of given below: (i) find  (i) (ii)  (iii)  (iv)  (v)   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | Y | | | | | | | X | 1 | 2 | 3 | 4 | 5 | 6 | | 0 | 0 | 0 | 1/32 | 2/32 | 2/32 | 3/32 | | 1 | 1/16 | 1/16 | 1/8 | 1/8 | 1/8 | 1/8 | | 2 | 1/32 | 1/32 | 1/64 | 1/64 | 0 | 2/64 | | CO1 | 10 |
| 5. | a. | In a large consignment of electric bulbs 10% are defective. A random sample of 20 is taken for inspection. Using binomial distribution, Find the probability that (i) all are good bulbs (ii) at most 3 are defectives (iii) atleast 3 are defectives. | CO1 | 10 |
| b. | The following mistakes per page were obtained in a book. Fit a poisson distribution and find the theoretical frequencies.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | No. of mistakes per book | 0 | 1 | 2 | 3 | 4 | | No. of times the mistakes occured | 211 | 90 | 19 | 5 | 0 | | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | The weekly wages of 1000 workmen are normally distributed around a mean of Rs.70 with a standard deviation of Rs.5. Estimate the number of workers whose weekly wages will be (i) More than Rs.72 (ii) Less than Rs.69 (iii) Between Rs.69 and Rs.72 | CO1 | 10 |
| b. | Fit a binomial distribution to the following data and find the expected frequencies:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | f | 5 | 18 | 28 | 12 | 7 | 6 | 4 | | CO1 | 10 |
| 7. | a. | In a city, a sample of 1000 were taken and out of them 540 are vegetarians and the rest are non - vegetarians. Can we say that both habit of eating are equally popular in the city at 5% level of significance. | CO3 | 10 |
|  | b. | The following data are taken from investigations:   |  |  |  |  | | --- | --- | --- | --- | |  | Sample Size | Mean Wages | S.D of wages | | Sample I | 400 | 47.4 | 3.1 | | Sample II | 950 | 50.3 | 3.3 |   Find out whether the two mean wages differs significantly. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | The group of 10 rats fed on diet A and another group of 8 rats fed on a different diet B recorded the following increase in weight.  Diet A: 5 6 8 1 12 4 3 9 6 10  Diet B: 2 3 6 8 10 1 2 8  Find if the variances are significantly different. | CO3 | 10 |
|  | b. | The table below gives the number of aircraft accidents that happen during the days of the week. Test whether the accidents are uniformly distributed over the week:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Days | Mon | Tue | Wed | Thurs | Fri | Sat | | No of accidents | 14 | 18 | 12 | 11 | 15 | 14 | | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. |  | The following data resulted from an experiment to compare three burners A, B and C. The latin square design was designed used as the tests were made on three engine and spread over 3 days.   |  |  |  |  | | --- | --- | --- | --- | | Days | Engines | | | | 1 | 2 | 3 | | 1 | A-16 | B-17 | C-20 | | 2 | B-16 | C-21 | A-15 | | 3 | C-15 | A-12 | B-13 |   Test the hypothesis that there is no significant difference between the burners. | CO3 | 20 |

ALL THE BEST