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



**End Semester Examination – Nov/Dec – 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 distribution   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Class | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 | 50 – 60 | | Frequency | 6 | 20 | 44 | 26 | 3 | 1 | | CO1 | 10 |
| b. | Calculate the mean deviation from mean for the following distribution  C.I : 0 – 10 10 – 20 20 – 30 30 – 40 40 – 50  Frequency: 5 8 15 16 6 | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | The score of two batsman A and B in 10 matches are given below. Who is the better player and who is the more consistent player?  A: 30 44 66 62 60 34 80 46 20 38  B: 34 46 70 38 55 48 60 34 45 30 | CO1 | 10 |
| b. | Calculate correlation coefficient from the following data  X: 10 14 18 22 26 30  Y: 18 12 24 6 30 36 | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | 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, show that his chance of winning is 30/61. | CO1 | 10 |
|  | b. | In a bolt factory, machines A, B and C produce 25%, 35%, 40 % of the total output respectively. Of their outputs 5%, 4%, 2% respectively are defective bolts. If a bolt is chosen at random from the combined output, what is the probability, that it is defective? If a bolt chosen at random is found to be defective, what is the probability that it was produced by B? | CO1 | 10 |
| (OR) | | | | |
| 4. |  | For the bivariate probability distribution of (X,Y) given below, find i.ii. iii.  iv. v.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | Y | | | | | | | X | 1 | 2 | 3 | 4 | 5 | 6 | | 0 | 0 | 0 |  |  |  |  | | 1 |  |  |  |  |  |  | | 2 |  |  |  |  | 0 |  | | CO1 | 20 |
| 5. | a. | Fit a Binomial distribution to the following data and find the theoretical frequencies.  x: 0 1 2 3 4 5 6  f: 5 18 28 12 7 6 4 | CO1 | 10 |
|  | b. | A manufacturer knows that 5% of his product is defective. He sells his product in boxes of 100. Using Poisson distribution find the probability that i. there are no defectives ii. exactly 3 defectives iii. at least 2 defectives. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Fit a Poisson distribution to the following data and find theoretical frequencies.  x: 0 1 2 3 4  f: 43 38 22 9 1 | CO1 | 10 |
|  | b. | The weekly wages of 1000 workmen are normally distributed with mean Rs 70 and standard deviation Rs. 5. Estimate the number of workers whose weekly wages will be i. less that Rs.69 ii. more than Rs 72 iii. between Rs.69 and Rs. 72 | CO1 | 10 |
|  |  |  |  |  |
| 7. | a. | In a city, a sample of 1000 people were taken, and out of them, 540 are vegetarian and the rest are non – vegetarians. Can we say that both habit of eating are equally popular? | CO2 | 10 |
|  | b. | A simple sample of heights of 6400 English men has a mean of 170 cm and an SD of 6.4 cm, while a simple sample of heights of 1600 Americans has a mean of 172 cm and an SD of 6.3 cm. Do the data indicate that Americans are, on the average, taller than the English men? | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | A group of 10 rats fed on Diet A and another group of 8 rats fed on 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 1 10 2 8  Find if the variances are significantly different. | CO2 | 10 |
|  | b. | On the basis of information noted below, find out whether the new treatment is comparatively superior to the conventional one.   |  |  |  | | --- | --- | --- | |  | Favorable | Non- Favorable | | Conventional | 40 | 70 | | New | 60 | 30 | | CO2 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | The following data resulted from an experiment to compare three burners A, B and C. A Latin square design was used as the tests were made on 3 engines and were spread over 3 days.  A16 B17 C20  B16 C21 A15  C15 A12 B13  Test the hypothesis that there is no difference between the burners. | CO3 | 20 |

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