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



**End SemesterExamination –Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **17MA2008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PROBABILITY AND STATISTICS** | **Max. Marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | The other name of cumulative frequency curve is  a) Histogram b) Pie diagram c) frequency polygon d) Ogive | CO2 | 1 |
| b. | The value in a series occurs most frequently is called  a) Mean b) Median c) Mode d) Range | CO1 | 1 |
| c. | Find Median for 60, 60, 100, 110, 55, 75, 40, 80, 90, 110. | CO1 | 2 |
| d. | Find Mode for the following data   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Weekly wages (Rs) | 100 | 200 | 400 | 500 | 600 | | No. of weeks | 5 | 8 | 21 | 12 | 6 | | CO3 | 2 |
| e. | i) The weights in grams of 50 apples picked out at random from a consignment are as follows:  106, 107, 76, 82, 109, 107, 115, 93, 187, 95, 123, 125, 111, 92, 86, 70, 126, 68, 130, 129, 139, 119,115, 128, 100, 186, 84, 99, 113, 204, 99, 113, 204, 111, 141, 136, 123, 90, 115, 98, 110, 78, 90, 107, 81, 131, 75, 84, 104, 110   * Form the grouped frequency table by dividing the range into intervals of equal width, each corresponding to 20 grams. Also draw Histogram and frequency polygon. | CO2 | 8 |
| ii) Calculate arithmetic Mean:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Marks | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | | No. of students | 42 | 38 | 120 | 84 | 48 | 36 | | CO1 | 6 |
| **(OR)** | | | | |
| 2. | a. | The SD of 2,2,2,2,2,2,2 and 2 is  a) 0 b) 1 c) 2 d) none | CO1 | 1 |
| b. | Second quartile is nothing but  a) Mode b) Mean c) Median d) range | CO1 | 1 |
| c. | Distinguish correlation coefficient from regression coefficient. | CO6 | 2 |
| d. | Find third quartile for 52, 55, 48, 44, 41, 60, 54, 72, 77, 63, 64. | CO1 | 2 |
| e. | Find mean, standard deviation and coefficient of variation for the following data   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | 2 | 5 | 8 | 11 | 14 | 17 | 20 | 23 | 26 | | f | 10 | 17 | 25 | 41 | 60 | 45 | 32 | 19 | 1 | | CO3 | 14 |
|  |  |  |  |  |
| 3. | a. | When bxy =-0.2 and byx=-0.8, r = \_\_\_\_  a) 0.16 b) 0.4 c) – 0.4 d) none | CO6 | 1 |
| b. | If you flipped 2 coins, what is the probability that both will land on tails?  a) 2/4 b) ¾ c) ¼ d) 0/4 | CO4 | 1 |
| c. | Probability values lies between \_\_\_\_\_\_\_\_ and \_\_\_\_\_ | CO1 | 2 |
| d. | A box contains 2000 components of which 15% are defective. A second box contains 5000 components of which 25% are defective. Two other boxes contain 1000 components each with 10% defective components. A box is chosen at random and an item selected as found to be defective. Find the probability that this has come from the first box. | CO4 | 10 |
| e. | If A and B are two events such that P(A ∪ B) = , P(A ∩ B) =  and P() = , find P(B) and P(A | B). | CO3 | 6 |
| **(OR)** | | | | |
| 4. |  | The following marks have been obtained by a class of students in Statistics:  Compute the coefficient of correlation.  Find also the equations of lines of regression.  Calculate Paper II mark when Paper I mark is 50   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Paper I | 45 | 55 | 56 | 58 | 60 | 65 | 68 | 70 | 75 | 80 | 85 | | Paper II | 56 | 50 | 48 | 60 | 62 | 64 | 65 | 70 | 74 | 82 | 90 | | CO6 | 20 |
|  |  |  |  |  |
| 5. |  | The joint probability mass function of (X,Y) is given by P(x, y) = k (2x + 3y) ; x = 0, 1, 2, y = 1, 2, 3.  Find the marginal distribution of X and Y.  Find P(X ≤ 1) and P( Y ≤ 2) | CO3 | 20 |
| **(OR)** | | | | |
| 6. | a. | Find the probability that in tossing a fair coin 5 times, there will appear (i) 3 heads (ii) 3 tails and 2 heads (iii) atleast 1 head (iv) not more than 1 tail. | CO4 | 10 |
| b. | The marks obtained by a large group of students in a final examination in statistics have a mean 58 and a standard deviation of 8.5. Assuming that these marks are approximately normally distributed, what percentage of the students can be expected to have obtained marks from 60 to 69, both inclusive? | CO4 | 10 |
|  |  |  |  |  |
| 7. | a. | Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women infavour of the proposal, are same against that they are not, at 5% level. | CO5 | 10 |
| b. | In certain experiment to compare two types of foods A and B, the following results of increase in weights were observed:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Food A | 49 | 53 | 51 | 52 | 47 | 50 | 52 | 53 | | Food B | 52 | 55 | 52 | 53 | 50 | 54 | 54 | 53 |   Assuming that the two samples are independent, can we conclude that food B is better than food A? | CO5 | 10 |
| **(OR)** | | | | |
| 8. | a. | A company keeps records of accidents. During a recent safety review, a random sample of 60 accidents was selected and classifieds by the day of the week on which they occurred. Test whether there is any evidence that accidents are more likely on some days than others.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Days | Mon | Tue | Wed | Thur | Fri | | No. of accidents | 8 | 12 | 9 | 14 | 17 | | CO5 | 10 |
| b. | 1000 students at college level were graded accordingly to their I.Q. and their economic conditions. What conclusion can you draw from the following data?   |  |  |  | | --- | --- | --- | | Economic Conditions | I.Q. Level | | | High | Low | | Rich | 460 | 140 | | Poor | 240 | 160 | | CO5 | 10 |
|  | | **Compulsory**: |  |  |
| 9. |  | A car rental agency, which use 4 different brands of tyres in the process of deciding the brand of tyre to purchase a standard equipment for its feet, fluids that each of 4 tyres of each brand last the following number of kilometers. (in thousands). **Analyze the data using one-way ANOVA.**   |  |  |  |  | | --- | --- | --- | --- | | Tyre Brands | | | | | A | B | C | D | | 36 | 46 | 35 | 45 | | 37 | 39 | 42 | 36 | | 42 | 35 | 37 | 39 | | 38 | 37 | 43 | 35 | | CO5 | 20 |