**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **3BC3006** | Roll No. | Total Printed Pages: 2 |
| **3BC3006** |  |
| BCA III (DS)- Semester (Back) End Semester Examination, November 2022 | |
| **BCD03101: Statistics & Probability** | | | |

# Time: **3** Hours. Total Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **--------------------------Nil--------------------** **2. ------------------Nil-----------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | A problem of statistics is given to three students A, B and c whose chances of solving it are 1/2, 1/3, 1/4 respectively. What is the probability that the problem will be solved, if they all try jointly? | **(6)** | **Evaluating** |
|  |  |  |  |  |
|  | **(b)** | What is the expected value of the number of points that will be obtained in a single throw with an ordinary die? | **(3)** | **Evaluating** |
|  |  |  |  |  |
|  | **(c)** | A letter is known to have come either from TATANAGAR or from CALCUTTA. On the envelope just two consecutive letters TA are visible. What is the probability that the letter came from CALCUTTA? | **(3)** | **Evaluating** |
|  |  | **OR** |  |  |
| **Q.2** | **(a)** | Write statement and prove that the multiplicative law of probability for two dependent events. | **(6)** | **Evaluating** |
|  |  |  |  |  |
|  | **(b)** | 5 boxes are numbered like 3, 5,7,8,9. A box is selected at random its number is recorded and then it is replaced. Find the expected value of the number that will occur. | **(6)** | **Evaluating** |
|  |  | **UNIT-II (CO2)** |  |  |
| **Q.3** |  | The scores of two batsman A and B in ten innings during a certain season are:  A: 32 28 47 63 71 39 10 60 96 14  B: 19 31 48 53 67 90 10 62 40 80  Find (using coefficient of variation) which of the two batsmen, A or B, is more consistent in scoring. | **(12)** | **Evaluating** |
|  |  | **OR** |  |  |
| **Q.4** | **(a)** | Calculate quartile deviation and the coefficient of quartile deviation from the following data:  Wages in Rupees per day <35 35-37 38-40 41-43 over 43  Number of wage earners 14 62 99 18 7 | **(6)** | **Evaluating** |
|  |  |  |  |  |
|  | **(b)** | Find the mean deviation from the median and from the mean of the following distribution:  X: 4 6 8 10 12 14 16  Y: 2 4 5 3 2 1 4 | **(6)** | **Evaluating** |
|  |  | **UNIT-III (CO3)** |  |  |
| **Q.5** | **(a)** | Two types of drugs were used on 5 and 7 patients for reducing their weight.  Drug A was imported and drug B indigenous, the decrease in the weight after using the drugs for six months was as follows:  Drug A : 10 12 13 11 14  Drug B : 8 9 12 14 15 10 9  Is there a significant difference in the efficiency of the two drugs? If not, which drug should you buy? (For v=10, t (0.05) =2.223) | **(6)** | **Evaluating** |
|  |  |  |  |  |
|  | **(b)** | In a sample of 1,000 people in Maharashtra, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in this State at 1% level of significance? (z=2.58) | **(6)** | **Evaluating** |
|  |  | **OR** |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Q.6** | **(a)** | Construct a 95 % confidence interval an experiment that found the sample mean temperature for a certain city in August was 101.82, with a population standard deviation of 1.2. There were 6 samples in this experiment .Find the value of confidence interval. | **(6)** | **Evaluating** |
|  |  |  |  |  |
|  | **(b)** | In a sample of 8 observations, the sum of squared deviations of items from the mean was 84.4. In another sample of 10 observations, the value was found to be 102.6. Test whether the difference is significant at 5% level.  You are given that at 5% level, critical value of F for v1 =7 and v2 =9 degrees of freedom is 3.29 and for v1 =8 and v2 = 10 degrees of freedom, its value is 3.07 | **(6)** | **Evaluating** |
|  |  | **UNIT-IV (CO4)** |  |  |
| **Q.7** | **(a)** | Set up an analysis of variance table for the following two way design results: F(2,6)=5.14, F(3,6)=4.76  Varieties of fertilizers varieties of seeds  A B C  W 6 5 5  X 7 5 4  Y 3 3 3  Z 8 7 4 | **(6)** | **Evaluating** |
|  | **(b)** | Three different traffic routes are tested for mean driving time. The entries in the table are the driving times in minutes on the three different routes. The one-way ANOVA results are shown in table.  Route 1 Route 2 Route 3  30 27 16  32 29 41  27 28 22  35 36 31  State SSbetween, SSwithin, and the F statistic. | **(6)** | **Evaluating** |
|  |  | **OR** |  |  |
| **Q.8** |  | In a school, 21 students of class 8th are randomly divided in three equal groups for comparative study of their span of immediate memory in three different motivational conditions. Condition A of zero motivation, Condition B of low motivation and Condition C of high motivation. The results obtained from all three conditions are given below;  Condition A: 6 5 7 9 6 5 4  Condition B: 7 8 8 7 9 11 6  Condition C: 11 10 12 9 12 13 10  Find:  (i) Is there significance difference between condition A and B.  (II) Is there significance difference between condition B and C.  (III)Is there significance difference between condition A and C.  Test the hypothesis at .05% and .01% significance level?  [at 5% level 1.75 ,1.75 , 1.84] [at 1% level 2.40,2.5,2.5] | **(12)** | **Evaluating** |
|  |  | **UNITV (CO5)** |  |  |
| **Q.9** | **(a)** | Ten competitors in a beauty contest are ranked by three judges in three following order:  Ist judge: 1 6 5 10 3 2 4 9 7 8  Ilnd judge: 3 5 8 4 7 10 2 1 6 9  Illrd judge: 6 4 9 8 1 2 3 10 5 7  Use the rank correlation coefficient to determine which pair of judged has the nearest approach to common tastes in beauty. | **(6)** | **Evaluating** |
|  | **(b)** | r and PE have values 0.9 and 0.04 for two series. Find n. | **(6)** | **Evaluating** |
|  |  | OR |  |  |
| **Q.10** | **(a)** | In a partially destroyed laboratory of an analysis of correlation data, the following results only are legible: variance of x =9.  Regression equation 8x-10y+66=0; 40x-18y=214.  Find   1. The mean values of x and y. 2. The variance of y.   The coefficient of correlation between x and y. | **(6)** | **Evaluating** |
|  | **(b)** | Two random variables have the regression equations:  3X+2Y-26=0  6X+Y-31=0  Find the mean values and the coefficient of correlation between X and Y. If the variable of X=25, find the standard deviation of Y from the data given above. | **(6)** | **Evaluating** |