

JAYPEE UNIVERSITY OF INFORMATRION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION DECEMBER -2018

B.TECH. IIIRD SEMESTER (BI/BT/BTDD)

COURSE CODE: 10B11MA311

MAX. MARKS: 35

COURSE NAME: PROBABILITY AND STATISTICS

COURSE CREDITS: 04

MAX. TIME: 2.0 Hrs

NOTE: All questions are compulsory. Carrying of **mobile phone** during examinations will be treated as case of unfair means. Use of scientific calculator is allowed. Marks are indicated in square brackets against each question.

Q.1 Calculate Karl Pearson's coefficient of Skewness from the data given below:

| | | | | | |
|-----------------------------|---------|---------|---------|---------|---------|
| Income (Rs.): | 400-500 | 500-600 | 600-700 | 700-800 | 800-900 |
| Number of Employees: | 8 | 16 | 20 | 17 | 3 |

[CO-I] [4]

Q.2 (A) If $P(A) = \frac{6}{11}$, $P(B) = \frac{5}{11}$ and $P(A \cup B) = \frac{7}{11}$, then determine: (i) $P(A|B)$ and $P(B|A)$.

(B) If the sum of the mean and variance of a binomial distribution of 5 trails is 4.8, then find the probability mass function.

[CO-II] [1.5+1.5=3]

Q.3 (A) The following is the distribution of the hourly number of trucks arriving at a company's warehouse:

| | | | | | | | | | |
|------------------------------------|----|-----|-----|-----|----|----|---|---|----|
| Trucks arriving (per hour): | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Frequency: | 52 | 151 | 130 | 102 | 45 | 12 | 5 | 8 | 20 |

Fit a Poisson distribution and test for goodness of fit at the 5% level of significance.

[Given, $\chi^2_{0.05(8)} = 15.507$]

(B) Memory capacity of 9 students was tasted before and after a course of meditation for a month. State whether the course was effective or not at the 5% level of significance from the data below:

| | | | | | | | | | |
|----------------|----|----|---|---|---|----|----|----|---|
| Before: | 10 | 15 | 9 | 3 | 7 | 12 | 16 | 17 | 4 |
| After: | 12 | 17 | 8 | 5 | 6 | 11 | 18 | 20 | 3 |

[Given, $t_{0.05(8)} = 2.31$]

(C) The average marks in Statistics of a sample of 100 students were 51 with standard deviation of 6 marks. Could this have been a random sample from a population with average marks 50?

[CO-III] [5+4+3=12]

[P. T. O.]

- Q.4** Obtain the regression lines of Y on X and X on Y from the following table and estimate:
 (i) The blood pressure when age is 45 years,
 (ii) The age when blood pressure is 120.

| | | | | | | |
|----------------------------|-----|-----|-----|-----|-----|-----|
| Age (in years) (X): | 56 | 42 | 72 | 36 | 63 | 47 |
| Blood Pressure (Y): | 147 | 125 | 160 | 118 | 149 | 128 |

[CO-IV] [4]

- Q.5 (A)** The yield of four varieties of rice in 3 blocks are given below:

| Varieties | Blocks | | |
|-----------|--------|----|-----|
| | I | II | III |
| <i>A</i> | 10 | 9 | 8 |
| <i>B</i> | 7 | 7 | 6 |
| <i>C</i> | 8 | 5 | 4 |
| <i>D</i> | 5 | 4 | 4 |

Perform an analysis of variance on this data and discuss whether there is any significant difference between varieties.

[Given, $F_{0.05(3,6)} = 4.76$]

- (B)** Three treatments A , B and C are composed in a completely randomized design (CRD) with four replication of each. The layout and the yield in quintals per acre are given in the following table:

| | | | |
|-------|-------|-------|-------|
| A (8) | B (7) | A (4) | C (2) |
| B (5) | C (5) | C (4) | B (5) |
| A (6) | C (4) | B (3) | A (7) |

Analyze the data and give your comments.

[Given, $F_{0.05(2,9)} = 4.26$]

[CO-V] [6+6=12]
