

Time allowed: 3 Hours

Max. Marks: 80

NOTE: Attempt five questions in all, selecting at least two questions from each unit. All questions carry equal marks.

 $x-x-x$

Unit - I

Q:1. a) A computer while calculating the correlation coefficient between two variables Y and X obtained the following results;

$$n = 25; \sum X = 125, \sum X^2 = 650, \sum Y = 100, \sum Y^2 = 460 \text{ and } \sum XY = 508$$

It was, however, later discovered at the time of checking that it had copied down two pairs of observations as (6, 14) and (8, 6), while the correct values were (8, 12) and (6, 8). Obtain the correct value of the correlation coefficient between X and Y. (10)

b) What is coefficient of determination? (6)

Q: 2. Given the following data:

X:	5	3	7	4	8	2	10	6	8	7	9	15
Y:	8	6	8	5	9	6	8	5	11	7	8	15

Obtain the two regression equations and calculate Standard Error of Estimate (SE_{yx}).

Q: 3. Distinguish clearly the difference between any four of the following concepts,

- Mathematical and statistical probability
- Simple and compound events
- Independent and dependent events
- Mutually exclusive and independent events
- Permutation and Combination.

Q: 4. (a) What is random sample? Discuss the various methods of drawing a random sample. (8)

(b) Distinguish between sampling and non-sampling errors. (8)

Q: 5. a) The following mistakes per page were observed in a book;

No. of mistakes per page	0	1	2	3	4
No. of times the mistake occurred	211	90	19	5	0

Fit the Poisson distribution to the given data. (8)

b) Explain any two theorems of probability in detail. (8)

Unit - II

Q: 6.a) Following information is available in respect of two brands of bulbs (Price same):

	Brand A	Brand B
Mean life (Hrs)	1300	1248
S. D (Hrs)	82	93
Sample size	100	100

Which brand should be Preferred at 5 percent level of significance. (10)

b) In a sample of 500 persons from a village in Haryana, 280 are found to be rice eater and rest wheat eaters. Can we assume that both the food articles are equally popular?(6)

Q: 7. What is statistical hypothesis? Discuss in detail the procedure of testing a statistical hypothesis. (16)

Q: 8. A certain stimulus administered to each of

a) 12 patients resulted in the following in crease in blood pressure: 5, 2, 8, -1, 3, 0, -2, 1, 5, 0, 4 and 6 can it be concluded that the stimulus will in general be accompanied by an increase in blood pressure? (For $v = 11, t_{0.01} = 2.21$). (10)

b) Discuss the F-test for testing the equality of two sample variances. (6)

Q: 9. Discuss in detail the role of computers and statistical packages in research analysis. Illustrate by giving the suitable examples.

Q: 10. a) What are non-parametric tests? In what ways are they different from parametric tests? (8)

b) Write notes on:

i) Man-Whitney U – statistics

(ii) Willcoxon- test.