

SET- 1

BA/B.Sc Statistics, Semester 1

COURSE No. USTTC-101(CBCS)

Title: Descriptive Statistics and Probability

Time: 3 Hours

Max Marks: 80

**Section A**

(3×5=15)

Attempt all questions

Q1 Define regression coefficient and also show that coefficient of correlation is the geometric mean of two regression coefficient.

Q2 For any two events A and B, prove that

(a)  $P(\bar{A} \cap B) = P(B) - P(A \cap B)$

(b)  $P(A \cap \bar{B}) = P(A) - P(A \cap B)$

Q3 Define histogram, frequency polygon and frequency curve with diagram.

Q4 Calculate the Spearman's correlation coefficient of the data in the table:

$X = 8, 7, 3, 2, 4$  and  $Y = 5, 8, 3, 1, 4$

Q5 Explain moments (Raw and Central moments).

**SECTION B**

(7×5=35)

Attempt all questions

Q1 Explain correlation Ratio and their properties.

Q2 Explain Partial correlation, distinguish between multiple and partial correlation.

Q3 Discuss Arithmetic mean with its properties.

Q4 (a) Define variance and standard deviation with merits and demerits.

(b) Find the mean and variance of first n natural numbers.

Q5 State and Prove Bays theorem.

**SECTION C**

(15×2=30)

Attempt any two questions

Q1 Define statistics and discuss its importance and scope in different fields.

Q2 Describe different measures of dispersion.

Q3 (a) Explain principle of least square.

(b) Fit a straight line curve by using the principle of least square

$X = 1, 2, 3, 4, 5$  and  $Y = 2.1, 3.3, 4.0, 4.5, 6.3$

Q4 (a) Define regression coefficient and its properties.

(b) Also find the regression line from the following data

$X = 57, 58, 59, 59, 60, 61, 62, 64$

$Y = 67, 68, 65, 68, 72, 72, 69, 71$

Q5 (a) Discuss in brief the concept of probability.

(b) A problem in Statistics is given to the three students A, B, C, whose chances of solving it are  $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$  respectively. What is the probability that the problem will be solved if all of them try independently?