Unique Paper Code   :   32375101

Name of the Paper   :   Statistical Methods (GE-1)

Name of the Course   :   B.Sc. (Hons.) Statistics

Semester   :   I

Duration   :   3 hours

Max Marks   :   75

<u>Instruction for candidates</u>

Attempt any FOUR questions.

All questions carry equal marks.

Show all the intermediate calculations and results.

1. A purchasing agent obtained samples of lamps from two suppliers. He had the samples tested in his laboratory for the length of life with the following results:

Length of life (in hrs.)	Samples from	
	Company A	Company B
500 – 700	12	15
700 – 900	10	3
900 – 1100	16	42
1100 – 1300	25	12
1300 – 1500	8	3
1500 – 1700	15	10

(i) Which company's lamps have greater average life?

(ii) Which company's lamps are more uniform/reliable?

2. Why do we use skewness and kurtosis? For the frequency distribution given below, calculate the coefficient of skewness based on quartiles:

Monthly Sales (Rs. lakh)	No. of Firms
Less than 20	30
Less than 30	225
Less than 40	465
Less than 50	580
Less than 60	634
Less than 70	644
Less than 80	650
Less than 90	665
Less than 100	680

3.   Why are the two lines of regression? Using the principle of least squares fit a curve of the form $Y = a + bX + cX^2$, to the following data.

X	46	45	44	43	42	41	45	44	43	42	41	40	42	41	40
Y	0.3	0.3	0.4	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6

4.   Define raw and central moments. If the first four moments of a distribution about the value 5 are equal to -4, 22, -117, and 560, determine the corresponding moments (i) about the mean, and (ii) about zero.

5. (i) From the heights (X_1), weights (X_2), and ages (X_3) of a group of students the following standard deviations and correlation coefficients were obtained:
   $\sigma_1 = 2.8$ inches, $\sigma_2 = 12$ kg, and $\sigma_3 = 1.5$ years, $r_{12} = 0.75$, $r_{23} = 0.54$, and $r_{31} = 0.43$.
   Calculate (a) multiple correlation coefficients, and (b) partial correlation coefficients.

   (ii) Ten recruits were subjected to a selection test to ascertain their suitability for a certain course of training. At the end of the training, they were given a proficiency test. The marks secured by recruits in the selection test (X) and the proficiency test (Y) are given below:

Serial No.	1	2	3	4	5	6	7	8	9	10
X	10	15	12	17	13	16	24	14	22	20
Y	30	42	45	46	33	34	40	35	39	38

   Calculate rank correlation coefficient.

6.   What is meant by a class frequency of first order, and second-order? What is dichotomy? The male population of a State is 250 lakhs. The number of literate males is 20 lakhs, and the total number of male criminals is 26 thousand. The number of literate male criminals is 2 thousand. Do you find any association between literacy and criminality?