FCS/SEM I/DS/Regular

Time: 2½ hrs. Marks:75

Note: (1) All questions are compulsory with internal choice.
(2) Figures to the right indicate full marks.
(3) Symbols have their usual meanings.
(4) Graph paper will be provided on request.
(5) Use of scientific calculator fx 82 series and below is only allowed.

Q.1 Answer the following (Any Four). (20)

(a) Find quartile deviation and coefficient of quartile deviation for the following data.

Class	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	6	8	17	21	15	11	2

(b) Calculate D_2 and P_{90} for the following data.

Marks	Below 10	10-20	20-30	30-40	40-50	Above 50
No. of students	8	10	22	25	10	5

(c) It is given that distribution is moderately skewed with median 10 and mean 12. Find the approximate value of mode.

(d) Find the mean for the following data using step deviation method.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	12	16	6	7	9

(e) Draw less than and more than ogive curve for the following data and hence find median.

Class	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	10	8	12	24	6	25	15

(f) State the merits and demerits of mode.

Q.2 Answer the following (Any Four). (20)

(a) Calculate the first four moments of the following distribution about mean and hence find the coefficient of skewness and kurtosis.

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

(b) Explain skewness and kurtosis.

(c) An analysis of marks of two groups are given. Find the standard deviation of group I.

	Group I	Group II
No. of students	100	200
Mean	60	45
S.D	-	4

(d) For a distribution, the mean is 10, variance is 16, $\gamma_1 = 1$ and $\beta_2 = 4$, (where γ_1 and β_2 are Karl Pearson coefficient of correlation and coefficient of kurtosis respectively). Find the first four moments about origin and comment on the nature of the distribution.

(e) Find the standard deviation using change of origin and scale.

Daily wages	30-40	40-50	50-60	60-70	70-80	80-90
No. of workers	7	13	21	15	8	5

(f) Explain Moments.

Q.3 Answer the following (Any Four) (20)

(a) Draw a scatter diagram for the following data and comment on it.

X	15	20	33	25	25	35	36	40	18	22
Y	5	15	23	15	20	28	30	40	10	15

(b) Find the coefficient of correlation for the following data representing price in Rs. X and sales in Rs. Y of a product.

X	84	80	92	85	95	90	83	87
Y	115	104	122	116	125	120	112	120

(c) Find the Spearman's rank correlation for the following data representing export (X) and local sales (Y).

X	12	15	13	20	15	14	19	13	21	18
Y	25	21	15	18	20	17	20	16	20	22

(d) Explain coefficient of determination.

(e) From the following data, obtain multiple correlation $R_{1.2.3}$

X_1	65	72	54	68	55	59	78	58	57	51
X_2	56	58	48	61	50	51	55	48	52	42
X_3	9	11	8	13	10	8	11	10	11	17

(f) From the following data, find regression equation of y on x and hence estimate y when $x = 13$.

X	14	10	15	11	9	12	6
Y	8	6	4	3	7	5	9

Q.4 Answer the following (Any five) **(15)**

(a) Explain logistic regression.

(b) Draw histogram and frequency polygon for the following data given below.

Class	5-10	10-15	15-20	20-25	25-30
Frequency	4	6	3	2	1

(c) Find the mode for the following data.

Income	2000-4000	4000-6000	6000-8000	8000-10000	10000-12000
No. of persons	16	34	60	37	13

(d) Find the standard deviation for the following data

Size of shoe	7	8	9	10	11
No. of person	5	10	20	10	5

(e) Explain scatter diagram.

(f) Using the following summations, find coefficient of correlation.
$n = 15$, $\sum x = 175$, $\sum y = 280$, $\sum x^2 = 2150$, $\sum y^2 = 6225$ and $\sum xy = 3400$

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