(2½ Hours) **[Total Marks: 75]**

N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All(Each of 5Marks) **(15M)**

(a) Multiple Choice Questions **(5M)**

(a) i. Absolute zero is defined in……
a. Nominal scale b. Ordinal scale c. Interval scale d. Ratio scale

ii. Median can be determined using …….
a. Histogram. b. Frequency polygon. c. Ogives. d. None of the above.

iii. First raw moment is equal to …….
a. 0 b. mean c. variance d. skewness

iv. Coefficient of variation is ---------- measure of dispersion.
a. Absolute b. Relative c. Both a) and b) d. None of the above

v. Probability always lies between ……
a. -1 to 1 b. 0 to 1 c. -∞ to ∞ d. 0 to ∞

(b) Fill in the blanks

i. Mid value of the class interval is called as ……. (Class length, Class mark, Class limit).

ii. Most frequently occurring value in the data set is called as..... (mean, median, mode).

iii. Second ordered central moment is …… (mean, variance, kurtosis).

iv. If the data is given in terms of ranks then .....correlation coefficient is used to determine relationship between two variables. (Spearman's, Karl Pearson's).

v. If a coin is tossed then the probability of head and tail is ……
(0.5, 0.25, 1.00)

(C) Short Answers in 1-2 sentences **(5M)**

i. Define percentile.
ii. Define coefficient of determination
iii. What is perfect correlation?
iv. Define probability
v. Define kurtosis.

Q. 2 Attempt the following (Any THREE) **(15M)**

(a) Describe different measurement scales.

(b) Distinguish using suitable example
i. Continuous and discrete frequency.
ii. Exclusive and Inclusive class interval.

(c) Draw a histogram for the following data showing marks obtained in the subject of statistics.

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	2	21	37	22	8

(d) Write five requisites of good measures of tenc ency.

(e) Define Arithmetic mean. Write any two merits and demerits for the same.

(f) Obtain coefficient of variation for the follc ing data
X: 3,5,7,9,12,6,3,8,6,9,5,12,11,8,10,8,7

Q. 3 Attempt the following (Any THREE) (15M)

(a) Define first four raw moments Also state the relationship between raw and central moments.

(b) Write a short note on Skewness and Kurto: is.

(c) With usual notation μ_1=1, μ_2= 3, μ_3= 0 and μ_4= 27 then Compute β_1 and β_2.

(d) What is scatter diagram? Draw scatter diagram for Perfect positive and Perfect negative relationships.

(e) Explain the concept of correlation and regression. Also discuss the situation to use spearman's correlation, Karl Pearson's correlation and regression analysis with one example.

(f) Obtain regression lines of the type Y on X and X on Y for the data given below:

X	12	14	15	12	19
Y	4	7	5	8	10

Q. 4 Attempt the following (Any THREE) (15)

(a) Explain the following using Venn Diagram
i. Union of two events. ii. Intersection of two events.

(b) A six faced dice is tossed. Write a sample space and find the probability of
i. even number ii. Prime number

(c) State the addition and multiplication theorem of probability

(d) Define random experiment, event, certain event, mutually exclusive events, sample space.

(e) Write a short note on conditional probability.

(f) Five Boys and three girls have to stand in a row for photograph. If they stand at random, find the probability that
i. Girls at the two extreme positions.
ii. All girls together.

Q. 5 Attempt the following (Any THREE) **(15)**

(a) Explain the procedure of plotting frequency polygon with one example.

(b) Define variance and write at least two merits and two demerits of it.

(c) Obtain Spearman's Rank correlation for the following data:

Rank by Judge 1	1	2	4	6	8	5	9	10	3	7
Rank by Judge 2	5	1	3	4	2	6	8	10	7	9

(d) Write a short note on Bayes' theorem.

(e) Write a short note on Stem and Leaf.

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