(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)

1. Temperature of a place is a _____ random variable.
   a. Discrete   b. Continuous   c. Qualitative   d. None of the above

2. The outcome when a coin is tossed is a _____ event.
   a. Impossible   b. Certain   c. Mutually exclusive   d. Probable

3. Correlation coefficient lies between _____ and _____.
   a. -1 & 1   b. 0 & 1   c. 0 & 5   d. -1 & 0

4. Coefficient of variation can be expressed as a _____
   a. Ratio   b. Product   c. Percentage   d. None of the above

5. If r=0 then the two regression lines are _____ to each other.
   a. Parallel   b. Perpendicular   c. Coincide   d. Different

(b) **Fill in the blanks** (5M)

1. The probability of getting the number 5 on the uppermost face
   of the die is _____.(1/5, 1/6, 2/6)

2. The equation y= a + bx represents a _____ relation between variables X &
   Y.(Linear, nonlinear, cannot be defined)

3. In 347 _____ is stem and _____ is leaf.((3,47),(34,7)(347,0))

4. µ4 represents the _____ moment.(4th central, 4th raw, 2nd central)

5. Quartile deviation is a measure of _____.(central tendency,
   skewness, dispersion)

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

1. Write the expression for the median for a grouped frequency distribution.

2. Define coefficient of determination.

3. State an example of nonsense correlation.

4. Write the mathematical definition for probability.

5. Define Attribute.

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

(a) Distinguish between discrete and continuous random variables.

(b) Define variance, standard deviation and coefficient of variation.

(c) Write a short note on Quantiles.

(d) Briefly explain dispersion of data. State any two absolute measures of
    dispersion you have studied

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(e) Draw a histogram for the following data showing sales of a shop

Sales(Rs)	0-10	10-20	20-30	30-40	40-50
# of days	9	18	35	27	11

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

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

(a) Define byx and bxy. State the dependent and the independent variable in each case.

(b) Define the rth raw and central moments for a distribution

(c) State the properties of regression equations

(d) For a data given, mean=50, CV=40% and SKp=-0.4. Find Standard deviation, mode and median.

(e) Obtain the relation between the 3rd and 4th raw & central moment

(f) Distinguish between positive and negative skewness.

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

(a) Write the sample space when a coin is tossed thrice and obtain the probability of getting exactly two heads.

(b) Explain mutually exclusive and exhaustive events with an example.

(c) State the addition and multiplication theorem of probability.

(d) Write a short note on complementary events.

(e) Explain in short the Bayes theorem

(f) The probability that the new rail budget will have an increase in the first class fare is 0.75, increase in the second class fare is 0.60 and increase in both is 0.45. Find the probability that the new rail budget will have an increase in 1) either first class or second class fare, 2) neither first class nor second class fare.

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

(a) Write the expression for combined and weighted Arithmetic mean.

(b) Illustrate the different types of scatter plots.

(c) Write the sample space for a die. What is the probability of getting a number > 3 On the uppermost face?

(d) Define Mode and state its merits.

(e) The following data shows the number of lectures attended and marks obtained by 9 students. Draw a scatter diagram and comment on the relationship between marks obtained and number of lectures attended.

Lect. attended	50	68	46	78	83	60	87	65	75
Marks	61	75	54	80	85	68	90	72	75

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