[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 249 **G** **Your Roll No.....**

Unique Paper Code : 290562

Name of the Paper : Basic Mathematical Statistics

Name of the Course : **B.A. (Prog.) Application Course**

Semester : V

Duration : 2 Hours Maximum Marks : 55

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. **1** is Compulsory.
3. Attempt any **four** questions from Question No. **2 to 7,** selecting at least **one** question from each of the **Section I, II** and **III.**
4. Give full explanation for each question.
5. Marks are indicated against each question.
6. Use of Simple Calculator is allowed.

1. Short answers with proper justification are expected in all the **five** parts of this question. Each part is of **3** marks. (3×5=15)

   (i) What do you understand by an 'ogive' ? How do you construct it ?

   (ii) Consider the following distribution

	Distribution A	Distribution B
Mean	100	90
Median	90	80
S.D.	10	10

   Do both the distributions have same degree of skewness ? Justify your answer.

P.T.O.

(iii) Let the two samples of human males yield the following results

	Sample 1	Sample 2
Age	25 years	11 years
Mean Weight	36.28	65.77
S.D.	4.53	36.28

Determine which is more consistent: the weight of the 25 years old or weight of 11 years old.

(iv) A box contains 500 bolts of which 40 are defective. Find the probability that a bolt chosen at random from the box is not defective.

(v) If $4y - 5x = 15$ is the regression line of y on x and the coefficient of correlation between x and y is 0.75, what is the value of the regression coefficient of x on y ?

SECTION I

2. Find Karl Pearson's coefficient of skewness : (10)

Wages more than (in Rs.):	5	15	25	35	45	55	65
Number of earners	100	80	75	60	55	20	0

3. A fund manager is considering investment in the equity shares of one of two companies. The criterion for selecting the company for investment is the consistency of return on network. The following data have been collected.

Financial Year	Return on Network (%)	
	Industry X	Industry Y
A	19	20
B	20	24
C	16	16
D	13	15
E	12	10

You are required to identify the company in which the fund manager should invest. (10)

SECTION II

4. An urban sociologist interested in neighborliness collected data for a sample of 10 adults on (X) how many years they have lived in their neighborhood and (Y) how many of their neighbors they regard as friends. Compute a Pearson's correlation coefficient for these data and determine whether the correlation is significant. (10)

X	1	5	6	1	8	2	5	9	4	2
Y	1	4	2	3	5	1	2	6	7	0

5. The following table gives age (X) in years of cars and annual maintenance cost (Y) (in hundred rupees).

X	1	3	5	7	9
Y	15	18	21	23	22

Estimate the maintenance cost for a 4-year old car after finding the appropriate regression equation. (10)

SECTION III

6. A company has two plants to manufacture scooters. Plant I manufactures 80 percent of the scooters and Plant II manufactures 20 percent. At plant I, 85 out of 100 scooters are rated standard quality. At plant II, 65 out of 100 scooters are rated standard quality. What is the probability that scooter came from plant II if it is known that the scooter is of standard quality. (10)

P.T.O.

7. The probability that machine A will be performing a usual function in 5 years' time is ¼ and the probability that machine B will still be operating usefully at the end of same period is 1/3. Find the probability that in five years' time :

   (a) both machines will be performing a usual function

   (b) only machine B will be operating,

   (c) at least one of the machines will be operating. (10)