



- Note: (i) All Questions are compulsory with internal choice.  
 (ii) Simple Calculator is allowed.  
 (iii) Graph papers will be provided on request.

**Q.1**

[A] Fill in the blanks. (Any 8 out of 10)

[8]

- i. Statistics majorly can be used in.....  
(Text data, Numerical data, Image data)
- ii. Average monthly electrical bill is.....  
(Text data, Numerical data, Image data)
- iii. Number of defective items in a sample of 20 items from a large shipment is.....  
(discrete data, continuous data, text data)
- iv. One of the limitations of primary data.  
(not accurate, obsolete, expensive)
- v. The advantage of primary data.  
(Accuracy, Ease of collection, Cost)
- vi. Less than cumulative curve can be used to calculate.....  
(A. mean, median, mode)
- vii. Cumulative Frequency Curve is also called.....  
(Frequency Curve, Histogram, Ogive)
- viii. The data 1, 100, 5, 2, 8, 3 and 7 represent the number of days it took 7 individuals to quit smoking after completing a course designed for this purpose. .... is sample median.  
(5,100,18)
- ix. The data 1, 100, 5, 2, 8, 3 and 7 represent the number of days it took 7 individuals to quit smoking after completing a course designed for this purpose. .... is sample mean.  
(5,100,18)
- x. Karl Pearson's correlation coefficient is denoted by the alphabet  
(r, R, K)

[B] State True or False. (Any 7 out of 10)

[7]

- i. If  $\sum |x - \text{mean}| = 180$  &  $n = 45$  then mean deviation is 4.
- ii. The correlation between weight and height of adult female in India is positive.
- iii. The Karl Pearson's correlation is calculated from rank.
- iv. If the value of correlation coefficient is 0.85 then we say correlation is strong positive.
- v. If increase in X leads to increase in Y then regression coefficient is negative.
- vi. If one of the regression coefficient positive then other regression coefficient is negative.
- vii. If the both regression coefficients are positive then correlation coefficient between the variable is negative.
- viii. If we want to estimate the value of y when the value of x is given we use regression of y on x.
- ix. A set of all possible outcomes of an experiment or action is called as sample space.
- x. The expected value of the random variable is also known as mean of the variable.

**Q.2** Solve the following: (ANY-ONE)

[15]

[A]

- i. The following are the sizes of the last 8 dresses sold at a women's boutique. What is the sample Mean, Median and mode?

8      10      6      4      10      12      14      10

- ii. During 3 hours at Heathrow airport 55 aircraft arrived late. The number of minutes they were is shown in the frequency table below.

Minutes Late	No. of aircrafts
0-10	27
10-20	10
20-30	7
30-40	5
40-50	4
50-60	2

Calculate the quartile deviation.

OR

[B]

- i. The "Computer Today" reported on home technology and its usage by person aged 12 and older. The following data are the hours of personal computer usage during one week for a sample of 50 persons. Plot cumulative frequency curve and calculate the median from it.

Class interval (computer usage in hours)	Frequency
0-3	5
3-6	28
6-9	8
9-12	6
12-15	3

- i. In a study of job satisfaction, a series of test was administered to 50 subjects. The following data was obtained; higher score represent greater satisfactions. Calculate the Mean Deviation and its coefficient.

Class Interval (Satisfaction score)	Frequency
40 - 49	5
50 - 59	5
60 - 69	10
70 - 79	15
80 - 89	11
90 - 99	4

Q:3 Solve the following: (ANYONE)

[15]

[A]

- i. The following data is the association between the IQ of each adolescent in a sample with the number of hours they listen to rock music per month. Determine the strength of the correlation between IQ and rock music using Spearman's rank correlation. Comment on the results.

<b>IQ</b>	99	120	98	102	123	105	85	110	117	90
<b>Hours</b>	2	0	25	45	14	20	15	19	22	4

- ii. The marketing manager of a large supermarket chain would like to use shelf space to predict the sales for pet food. A random sample of 12 equal sized stores is selected, with the following results.

Store	1	2	3	4	5	6	7	8	9	10	11	12
Shelf Space (X) (feet)	5	5	5	10	10	10	15	15	15	20	20	20
Weekly sales (Y)(\$)	160	220	140	190	240	260	230	270	280	260	290	310

Calculate the regression equation by the least square method and use it to estimate weekly sales of store with shelf space of 25 feet's.

OR

[B]

- i. Given the two regression lines  $5X + 6Y = 160$  and  $X + 2Y = 40$ , find the arithmetic mean of  $X$  and  $Y$
- ii. A department of transportation's study on driving speed and mileage for midsize automobile resulted in the following data.

Driving speed :	30	50	40	55	30	25	60	25	50	55
Mileage :	28	25	25	23	30	32	21	35	26	25

State the dependent (Y) variable and the independent (X) variable. Compute and interpret the correlation coefficient within the context of this problem.

Q:4 Solve the following: (ANY-ONE)

[15]

[A]

- i. A bag has 20 coins numbered from 1 to 20. A coin is drawn at random and its number is noted. What is the probability that the coin drawn
- has an even number on it
  - has a number that is divisible by 3
  - has a number that is divisible by 3 or 5?
- ii. From the past experience it is known that A can solve 3 examples out of given 5 and B can solve 5 examples out of given 7. An example is given to both of them to solve independently. Find the probability that
- the example remain unsolved
  - the example is solved
  - only one of them solved the example.

OR

[B]

- i. A survey of 50 students at XYZ College about the number of extracurricular activities resulted in the data shown.
- |                       |   |    |    |   |   |   |
|-----------------------|---|----|----|---|---|---|
| Number of activities: | 0 | 1  | 2  | 3 | 4 | 5 |
| Frequency :           | 8 | 20 | 12 | 6 | 3 | 1 |
- Find the probabilities that a student selected at random participates (a) in at least 1 activity (b) in 3 or more activities (c) in exactly 2 activities.
- ii. In a game of throwing a far dice, Mr. ABC wins Rs60\ - if a 6 is thrown. He gains Rs30\ - if the dice shows 2 or 4 and loses Rs30\ - if odd numbers occurs on the uppermost face of the dice. Find the expected gain of Mr. ABC.

Q:5 Solve the following: (ANY-ONE)

[15]

[A]

- i. The "Computer Today" reported on home technology and its usage by person aged 12 and older. The following data are the hours of personal computer usage during one week for a sample of 50 persons. Calculate the mode.

Class interval (computer usage in hours)	Frequency
0-3	5
3-6	28
6-9	8
9-12	6
12-15	3

- ii. The growing use of personal computers is suggested to be one reasons people can operate at-home business. Following is a sample of age data for individuals working at home.

22 58 24 50 29 52 57 31 30 41  
44 40 46 29 31 37 32 44 49 29

Compute the quartile deviation and coefficient of quartile deviation.

OR

[B] Write short notes. (ANY THREE)

- Average and its important in data analysis.
- Skewness and types of skewness.
- Types of correlation
- Difference between correlation and regression
- Properties of regression.