

Q 1) (A) Select the appropriate answers (Any Eight) (8)

- 1) The difference between the highest and lowest value in the data is called as \_\_\_\_\_ (Quartile deviation, deviation, Range)
- 2) If variance of a variable is 36 then standard deviation is \_\_\_\_\_ (1, 6, -6)
- 3) The two ogive curves are used to find graphically \_\_\_\_\_ (Mean, mode, median)
- 4) The data collected for the first time is called as \_\_\_\_\_ (Secondary, Binary, Primary)
- 5) Correlation coefficient  $r \geq 0.6$  means \_\_\_\_\_ (Weak correlation, negative correlation, strong correlation)
- 6) With respect to Time series data, the variations due to seasonal changes are called as \_\_\_\_\_ (Secular Trend, Cyclical trend, seasonal variation)
- 7) There are \_\_\_\_\_ regression lines for given bivariate data (One, two, three)
- 8) The value of Index number above 100 indicates \_\_\_\_\_ in the phenomenon (Decrease, Increase, stability)
- 9) The optimistic decision maker will use the principal of \_\_\_\_\_ (Minimax, Maximin, Maximax)
- 10) Probability of getting number 6 on the upper face of a die is \_\_\_\_\_ ( $\frac{1}{4}, \frac{1}{8}, \frac{1}{6}$ )

(B) State whether True Or False (Any 7) (7)

- 1) Arithmetic mean is capable of further algebraic treatment.
- 2) Coefficient of variation is based on mean and standard deviation.
- 3) Quartiles divide the entire data in 2 equal parts.
- 4) If  $b_{xy} = 0.62$  and  $b_{yx} = 1.2$ , then value of correlation coefficient  $r = 0.86$
- 5) The two regression lines intersect in the point  $(\bar{x}, \bar{y})$
- 6) There is only one middlemost observation if no. of observations  $n$  is even.
- (7) Median divides the data in 2 equal parts
- (8) In decision making problem, Maximin criteria considers optimistic approach.
- (9) Possible number of Arrangements of  $n$  different objects is called combination.
- 10) If two variables move in the same direction, the correlation between them is negative.

Q. 2 ) Attempt either A and B both Or P and Q both

(A) Following data gives the number of admissions in the different streams in a college .

Represent the data with the help of suitable diagram and answer the questions below (7)

streams	No. of Boys	No. of Girls
Arts	2500	3500
Commerce	5000	4700
Science	4000	3000

- i) How many total no. of students are admitted in the college?
- ii) Which stream has the highest no. of girls?

2.(B) Calculate Arithmetic mean and mode for the following data (8)

marks	20-40	40-60	60-80	80-100	100-120	120-140	140-160
No. of students	4	10	12	14	7	6	2

(OR)

Units	100-200	200-300	300-400	400-500	500-600	600-700	700-800
No. of Customers	7	15	22	24	20	12	5

2.(Q) Find lower quartile  $Q_1$  and Upper quartile  $Q_3$  for the following data (7)

Height(in cm)	15-20	20-25	25-30	30-35	35-40	40-45
No. of students	7	9	15	11	5	3

Q3. (A) Find Variance and standard deviation for the following data. Also

find Coefficient of variation (8)

Income(in 000 Rs.)	5-7	7-9	9-11	11-13	13-15	15-17
No. of persons	5	8	10	11	7	6

Q3.(B) Find coefficient of correlation between demand and price (7)

Price	8	12	16	14	12	10
Demand	14	22	20	15	22	24

(OR)

Q3. (P) Find Spearman's Rank correlation coefficient for the following data (7)

Marks by Judge I	58	78	40	60	54	48	62	75	55	50
Marks by Judge II	45	70	50	64	68	40	55	66	58	52

3.(Q) Find the regression equation of Y on X and X on Y from the following data

$$\sum x = 46, \quad \sum x^2 = 3086, \quad \sum y = 9, \quad \sum y^2 = 483$$

$$\sum xy = 1095, \quad n = 7$$

Estimate Y when  $x = 20$

Q4. (A) Find 3 yearly moving average for the following time series (7)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export(in lakh tons)	500	520	510	540	550	530	600	620	600	610

Q4.(B) Calculate Laspeyres, Paasche's and Fisher's Index Number from the following data (8)

Commodity	2008		2014	
	Price	Quantity	Price	Quantity
A	14	15	20	20
B	16	10	18	30
C	30	20	45	20
D	15	10	25	15

XY9BCK

Q4.(P) (1) A box contains 4 blue and 6 marbles. 4 marbles are selected randomly from the box. Find the probability that (i) 3 blue marbles and 2 red marbles are selected (4)  
(ii) all red marbles are selected

4.(P) (2) Following are the two regression lines with variables X and Y

$3x + 2y = 110$  and  $4x + 5y = 205$ , Find  $\bar{X}, \bar{Y}$  (4)

4.(Q) Following data gives 4 states of nature E1, E2, E3 and E4 with respective probabilities 0.4, 0.3, 0.1 and 0.2 and 4 course of actions A1, A2, A3 and A4 (7)

States of nature	Course of actions			
	A1	A2	A3	A4
E1	400	450	300	200
E2	300	500	350	200
E3	450	530	360	390
E4	400	300	350	300

Find the best course of action using EMV

Q.(5)(A)

A committee of 5 persons is to be formed from among 3 officers and 4 managers and 5 workers. Find the probability that the committee contains—(i) exactly 3 managers (ii) no officer (iii) all workers (7)

5.(B) Phoenix company is evaluating 4 alternatives for investment. Following pay-off table is available (8)

State of economy	Pay-off (in 0000 Rs.)				
	A1	A2	A3	A4	A5
Fair	75	58	30	48	62
Good	52	40	40	85	70
Better	30	35	25	60	55

Decide the best alternative for investment using the criteria – (i) Maximin (ii) maximax (iii) Laplace (iv) Hurwitz  $\alpha = 0.7$

OR

Q.(5) Write short notes (any three)

(15)

- i) Primary data and secondary data
- ii) Seasonal, Secular and Irregular Variations in Time series.
- iii) Merits and demerits of Mean and Median
- iv) State of Nature, Course of Action, Pay-off in Decision theory.
- v) Measures of correlation.

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