

Day: Thursday
Date: 02/05/2019

S-2019-0316

Time: 03.00 PM TO 06.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of Logarithmic table and pocket **CALCULATOR** is allowed.

Q.1 A) Choose correct alternative for: (06)

- i) If $A = \begin{vmatrix} 4 & 3 \\ 0 & -4 \end{vmatrix}$ then $A = \dots$
a) 0 b) 12 c) -16 d) 16
- ii) Given $B = \begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$, What is order of matrix B ?
a) 1x2 b) 2x1 c) 1x1 d) 2x2
- iii) What is amount on Rs. 300/- at 10% p.a. simple interest for 2 years?
a) Rs. 400 b) Rs. 300 c) Rs. 360 d) Rs. 400
- iv) The variance of set of 10 observations is 3. If every observation is doubled, the new value of variance will be
a) 3 b) 6 c) 9 d) 12
- v) The two regression lines intersect at
a) (0, 0) b) (\bar{x}, \bar{y}) c) (σ_x, σ_y) d) (1, 1)
- vi) The correlation coefficient between X and Y is 0.63, what is correlation between X and -Y,
a) 0.44 b) 0.63 c) -0.63 d) 1

B) Attempt the following: (06)

- i) Define Row matrix.
- ii) Define period of annuity.
- iii) Is it possible to find $\begin{bmatrix} 2 & 3 \\ 0 & 0 \end{bmatrix} + \begin{bmatrix} 4 & 1 & 2 \\ 1 & 3 & 0 \end{bmatrix}$?
Give reason.
- iv) If $n = 10$, $\sum X = 20$, $\sum X^2 = 8$, find standard deviation of X.
- v) If $\sigma_x = 3$, $\sigma_y = 4$ and $b_{yx} = \frac{3}{5}$, find r.
- vi) State the relation between regression coefficients and correlation coefficient.

Q.2 Attempt **ANY TWO** of the following: (12)

- a) Find correlation coefficient between X and Y for the following data:
 $n = 10$, $\sum X = 650$, $\sum X^2 = 42324$, $\sum Y = 553$, $\sum Y^2 = 30665$, $\sum XY = 35968$
- b) Six competitors in a beauty contest are ranked by 2 judges in the following order

Judge A	6	2	1	3	5	4
Judge B	4	5	3	1	6	2

Compute Spearman's rank correlation coefficient between A and B.

c) A Study of age of husband and wife gives the following results:

	Husband	Wife
Mean	27 yrs	23 yrs
Standard Deviation	3 yrs	2 yrs
Correlation Coefficient	0.93	

Estimate the age of wife if the age of husband is 23 yrs.

Q.3 Attempt ANY THREE of the following: (12)

a) A group of 100 items have mean and S.D. 60 and 6 respectively. Another group of 200 items have mean and S.D. 63 and 4 respectively Find mean and S.D. of combined group.

b) Find variance for the following data:

Class	5-15	15-25	25-35	35-45	45-55
Frequency	5	12	18	6	2

c) What is scatter diagram and how it helps in determining types of correlation?

d) Find range and coefficient of range for the following data:

130 126 124 123 120 113 118

Q.4 Attempt ANY TWO of the following: (12)

a) Given

$$A = \begin{bmatrix} 3 & 4 & -2 \\ 9 & 6 & 4 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \end{bmatrix}$$

Find $2A+3B$ and $4A-3B$

b) What is the EMI of loan of Rs. 2,50,000/- if repaid in 10 years, at the rate of interest 5% p.a. on the outstanding amount at the beginning of each year?

c) A sum of money amount to Rs. 2812.16 in 3 years and to Rs. 3041.50 in 5 years, find the rate of interest and principal.

Q.5 Attempt ANY THREE of the following: (12)

a) Find the value of D

$$D = \begin{vmatrix} 2 & -4 & 3 \\ 2 & 1 & 1 \\ 4 & 2 & 2 \end{vmatrix}$$

b) What sum will amount to Rs. 50,000/- in 5 years at 10% p.a. compound interest?

c) State the order and type of the following matrices.

$$\text{i) } \begin{bmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 3 \end{bmatrix} \quad \text{ii) } \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

d) In how many years will Rs. 25000/- will amount to Rs. 67,500/- at 10% p.a. simple interest?

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