

BACHELOR OF COMMERCE (CBCS - 2018 COURSE)
F. Y. B. Com. Sem-II :SUMMER- 2022
SUBJECT : BUSINESS MATHEMATICS & BUSINESS STATISTICS-II

Day : Wednesday
Date : 13-07-2022

S-18141-2022

Time : 11:00 AM-02:00 PM
Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.

Q.1 Attempt **ANY TWO** of the following: **[12]**

- a) Calculate Spearman's rank correlation coefficient between the following marks given by two judges in series of eight one act plays in drama competition.

One act play number	1	2	3	4	5	6	7	8
Marks by Judge A	81	72	60	33	29	11	56	42
Marks by Judge B	75	56	42	15	30	20	60	80

- b) Explain the term covariance and correlation.

- c) Following is the information about the bivariate data:

$$n = 20, \sum x = 80, \sum y = 40, \sum x^2 = 1680, \sum y^2 = 320, \sum xy = 480$$

- i) Obtain the regression line of Y on X.
- ii) Estimate Y for X = 3.

Q.2 Attempt **ANY THREE** of the following: **[12]**

- a) Find correlation coefficient between X and Y given the following data:
 $n = 25, \sum x = 75, \sum y = 100, \sum x^2 = 250, \sum y^2 = 500, \sum xy = 325$.

- b) Find the range and coefficient of range for the following data:
19, 13, 18, 19, 18, 18, 19, 28, 12.

- c) For a bivariate data we have

$$\bar{x} = 33, \bar{y} = 18, b_{yx} = 1.5 \text{ and } b_{xy} = 0.2$$

- Find: i) Correlation coefficient between X and Y.
ii) Estimate X for Y = 20.

- d) Draw the scatter diagram for the following data and interpret the result:

X	40	34	28	30	32	40	45	44	38	31
Y	32	39	26	30	35	34	30	38	34	28

Q.3 Attempt **ANY TWO** of the following: **[12]**

- a) An amount of ₹ 500 becomes 524 in 3 years at a certain rate of simple interest, if the rate of interest increases by 4%, what amount will ₹ 500 becomes in 2 years?

- b) Distinguish between simple interest and compound interest.

- c) Solve the following equations by Cramer's rule:
 $5x + y = -13, 3x - 2y = 0$

P.T.O.

Q.4 Attempt **ANY THREE** of the following: **[12]**

a) If $A = \begin{bmatrix} 5 & 4 \\ -2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 3 \\ 4 & -1 \end{bmatrix}$ then find matrix C such that $3A - 2B + C = I$ where I is identity matrix of order 2.

b) Find x, if $\begin{vmatrix} x-1 & x+1 & 1 \\ 1 & 2 & 1 \\ 1 & 2 & 3 \end{vmatrix} = 0$.

c) What sum will amount to ₹ 1500 in 2 years at 2% p.a. compound interest?

d) Define transpose of a matrix. If $A = \begin{bmatrix} 1 & 4 & 7 \\ 1 & 2 & 5 \\ 3 & -2 & -1 \end{bmatrix}$, find $(A')'$.

Q.5 A) Attempt **ANY TWO** of the following: **[06]**

a) State the merits and demerits of the range.

b) Given $r = 0.6$, $\sigma_x = 1.5$, $\sigma_y = 2$ then find $\text{cov}(X, Y)$ and b_{yx} .

c) Define correlation and state its type.

B) Attempt **ANY TWO** of the following: **[06]**

a) If $A = \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 3 \\ -1 & 5 \end{bmatrix}$, show that $|AB| = |A||B|$.

b) Evaluate : $D = \begin{vmatrix} 6 & 5 & 0 \\ -1 & 2 & 1 \\ 2 & 1 & 1 \end{vmatrix}$.

c) Define : i) Lender and Borrower ii) Interest.

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