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

Day : Friday

Time : 02:00 PM-05:00 PM

Date : 16-12-2022

**W-18141-2022**

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 the coefficient of correlation between X and Y for the following data:

| X | 4 | 6 | 8 | 10 | 7 |
|---|---|---|---|----|---|
| Y | 2 | 4 | 6 | 8 | 10 |

b) Compute the coefficient of variation for the following data:

| Class | 0 – 20 | 20 – 40 | 40 – 60 | 60 – 80 | 80 – 100 |
|-------|--------|---------|---------|---------|----------|
| f | 06 | 12 | 25 | 12 | 05 |

c) State the properties of regression coefficients.

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

a) Eight entries in music contest were rated by two judges X and Y as follows:

| Ranks by X | 5 | 6 | 8 | 4 | 7 | 2 | 1 | 3 |
|------------|---|---|---|---|---|---|---|---|
| Ranks by Y | 6 | 5 | 7 | 3 | 8 | 2 | 4 | 1 |

Compute the rank correlation coefficient between X and Y.

b) Find the range and coefficient of range for the following data:
$10, 05, 56, 60, 06, 108, 10, 04, 25, 21.$

c) The regression equations are given by
$4x - 5y - 32 = 0$ and $20x - 9y - 107 = 0$
Find : **i)** Means of X and Y.
**ii)** Correlation coefficient between X and Y.

d) Following table gives aptitude score (X) and creativity (Y):

| X | 63 | 61 | 62 | 52 | 69 | 72 | 55 | 67 | 80 | 73 |
|---|----|----|----|----|----|----|----|----|----|----|
| Y | 69 | 65 | 67 | 60 | 72 | 86 | 62 | 75 | 82 | 83 |

Draw the scatter diagram and comment on the type of correlation between X and Y.

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

a) The population of a town is 55,000 and increases every year by 2% of the population at the beginning of that year. Find the population after 10 years.

b) An amount of ₹ 750 becomes ₹ 830 in 4 years at a certain rate of simple interest, if the rate of interest increases by 2%, what amount will ₹ 750 becomes in 2 years?

c) Solve the following equations by Cramer's rule:
$-2x + 3y = -3,$ $3x - 4y = 5$

**P.T.O.**

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

**a)**   If $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 0 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & -5 & 1 \\ -3 & 2 & -1 \end{bmatrix}$ then find A + 3B,  2A – 5B.

**b)**   Find the inverse of matrix $A = \begin{bmatrix} 4 & -7 \\ 5 & -9 \end{bmatrix}$ by adjoint method.

**c)**   Find $x$, if $\begin{vmatrix} x & 5 & 5 \\ 5 & 5 & x \\ 3 & 5 & 5 \end{vmatrix} = 0$.

**d)**   Find in what time a sum of money will double itself at 9% p.a. compound interest.

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

**a)**   If correlation coefficient between X and Y is -0.875, find that between

   **i)** X and –Y          **ii)** 2X and 3Y          **iii)** $\dfrac{X-10}{5}$ and $\dfrac{10-Y}{5}$

**b)**   State the merits of the standard deviation.

**c)**   Define regression coefficients.

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

**a)**   Distinguish between simple interest and compound interest.

**b)**   Define with example: **i)** Column matrix     **ii)** Diagonal matrix.

**c)**   Evaluate : $D = \begin{vmatrix} 0 & 2 & -1 \\ 4 & 5 & 3 \\ -2 & 1 & 0 \end{vmatrix}$

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