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SEAT No. :

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[5952]-204

First Year B.Com.

124 - A : BUSINESS MATHEMATICS & STATISTICS - II

(2019 CBCS Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All the questions are compulsory.
- 2) Use of simple calculator is allowed.
- 3) Figures to the right indicate full marks.

Q1) A) Fill in the blanks (any 5):

[5]

- a) For two matrices to be added, the matrices must be of _____.
(same size, different size, identical type)
- b) The rank of $n \times n$ matrix is _____ if all its elements are 5.
(Five, Two, One)
- c) Use of graphical method of LPP is to solve _____.
(Final Solution, Linear Equations, Initial Solution)
- d) Coefficient of correlation will be always _____.
(Between - 1 and 1, more than 0, more than 1)
- e) Regression is measure of average relationship between _____ variable.
(two or more, one or zero, one)
- f) _____ is known as the 'ideal formula' for constructing index numbers.
(Fisher's Index, Paasche's Index, Laspeyre's Index)

P.T.O.

- B) State the following statement are 'True' or 'False': (any 5): [5]
- The consumer Price Index can be used to correct the effect of inflation in comparing incomes from year to year.
 - In a simple linear regression model, a negative slope term always indicates negative correlation.
 - Determinant and Matrix are of the same meaning.
 - The inverse of a matrix will exist only if determinant is zero.
 - Index numbers helps in comparison of changes in price.
 - Regression is the technique of prediction on the basis of correlation.

Q2) Solve any three from the following: [15]

- Let $A = \begin{bmatrix} 2 & 4 \\ 5 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 6 & 8 \end{bmatrix}$ Find $A + B$ and $A - B$.
- A dealer deals in two items radios and TV. He has 5,00,000/- to invest and stores 60 pieces. One TV cost is 25,000/- and one radio cost is 5,000/-. If one radio gives a profit of 500/- and one TV gives profit of 2,500/-. Formulate the situation as a LPP to maximize the profit.
- Compute Paasche's and Laspeyre's Price index number for the following data:

Commodity	Price		Quantity	
	2014	2020	2014	2020
P	15	22	60	35
Q	17	28	56	44
R	12	22	8	14
S	18	8	19	32
T	22	14	11	29

- Explain the types of Matrix.
- What are the types of correlation?

Q3) Solve any three from the following:

[15]

- a) Solve the following Determinant.

$$D = \begin{vmatrix} 2 & 3 & 5 \\ 3 & 2 & 3 \\ 4 & 1 & 6 \end{vmatrix}$$

- b) Solve graphically given LPP

Minimize $Z = 50x + 70y$

Subject to $2x + y \geq 8$

$$x + 2y \geq 10$$

$$x \geq 0, y \geq 0$$

- c) Compute the Fisher's ideal price index number for 2021 on the basis of 2014 with the following information.

Commodity	Price		Quantity	
	2014	2021	2014	2021
A	5	10	4	12
B	8	6	7	7
C	6	4	5	3

- d) State the advantages of index number.
e) What are the advantages of regression analysis?

Q4) Solve any three from the following:

[15]

- a) Solve the following set of equations by using matrix inverse method:

$$2x + 3y = 5$$

$$11x - 5y = 6$$

- b) Draw the graph of linear equation.

$$5x + 3y = 15 \text{ and } 2x + 5y = 10$$

- c) The marks obtained by 9 students in two subjects Marathi and Hindi are given below. Compute the Rank Correlation Coefficient of Spearman.

Marks in Marathi	35	23	47	17	10	43	9	6	28
Marks in Hindi	30	33	45	23	8	49	12	4	31

- d) Explain the concept of LPP.
 e) What is Index Number? State the types of Index Number.

- Q5) a) Calculate the coefficient of correlation for the following data: [10]

Price	50	55	48	54	60	56	58	59
Supply	90	110	75	100	120	110	115	120

- b) If $A = \begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 5 \\ 3 & 4 \end{bmatrix}$ Find AB and BA. [5]

OR

- b) Following are the data related to marks obtained by 100 students of a class in two subjects - Economics and Co-operation. Find out probable marks in Economics of a student who secured 70 marks in Co-operation. [5]

Item	Economics	Co-operation
Mean	55	80
Standard Deviation	9	12
Correlation Coefficient	0.8	

