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(5th Semester)

COMMERCE

Paper : BC–503

(Business Mathematics and Computer Applications)

Full Marks : 70   *Pass Marks* : 45%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(*Marks* : 45)

*The figures in the margin indicate full marks
for the questions*

1. *(a)*   *(i)* Evaluate (without expanding) :   4

$$\begin{vmatrix} 12 & 16 & 20 \\ 5 & -6 & 3 \\ 3 & 4 & 5 \end{vmatrix}$$

        (ii) Solve with the help of Cramer's rule :   5

$$x + y + z = 3$$
$$y - z = 0$$
$$x + y = 2$$

Or

(b) The total sales S in thousand of rupees of a firm selling two products x and y is given by the relationship

$$S = a + bx + cy$$

Data for the first three months are given by the following :

Months	Total Sales	x	y
1	12	2	3
2	13	6	2
3	15	5	3

Using determinant method, determine the sales in the next month when it sells 4 units of x and 5 units of y. 9

2. (a) (i) If

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$$

show that

$$(aA + bB)(aA - bB) = (a^2 + b^2)A \qquad 4$$

(ii) Find the inverse of a matrix

$$\begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix} \qquad 5$$

Or

(b) If

$$A = \begin{bmatrix} 1 & 2 & 1 \\ 0 & 1 & -1 \\ 3 & -1 & 1 \end{bmatrix}$$

show that $A^3 - 3A^2 - A + 9I = 0$. 9

3. (a) (i) Evaluate : 4

$$\lim_{x \to 0} \frac{\sqrt{2 + 3x} - \sqrt{2 - 5x}}{4x}$$

(ii) Find the first-order partial derivatives of $x^2 + 6xy + y^2$. 5

Or

(b) Find the maximum and minimum values of the function

$$\frac{2}{3}x^3 + \frac{1}{2}x^2 - 6x + 8 \qquad 9$$

4. (a) Explain various components of computer system with diagram. 9

Or

(b) Discuss various areas of computer application. 9

5. *(a)* Discuss various types of computer networking. 9

<center>*Or*</center>

(b) Define network topologies. Explain various types of network topologies with diagram. 2+7=9

<center>★★★</center>