

2017

(5th Semester)

COMMERCE

Paper No. : BC-503

**(Business Mathematics and
Computer Application)**

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) Solve the following system of equations by Cramer's rule : 5

$$x + y + z = 3$$

$$2x + 3y + 4z = 9$$

$$x + 2y - 4z = -1$$

(2)

(ii) Prove that

$$\begin{vmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{vmatrix} = (5x+4)(4-x)^2 \quad 4$$

Or

(b) (i) Find the adjoint determinant of the following determinant and show that $\text{adjoint } \Delta = \Delta^2$: 2+4

$$\Delta = \begin{vmatrix} 3 & 2 & 1 \\ 2 & 1 & 2 \\ 2 & 2 & 2 \end{vmatrix}$$

(ii) If $P(x-y)$ is any point on the line joining the points $A(a, 0)$ and $B(0, b)$, show that

$$\frac{x}{a} + \frac{y}{b} = 1$$

by using determinant. 3

2. (a) (i) Let

$$A = \begin{bmatrix} 5 & 3 \\ 12 & 7 \end{bmatrix}$$

Verify that $A^2 - 12A - I_2 = 0$. Also obtain A^{-1} . 6

(3)

(ii) If

$$A = \begin{bmatrix} 2 & 3 \\ 5 & 6 \\ 7 & 2 \end{bmatrix}$$

and

$$B = \begin{bmatrix} 3 & 1 \\ 5 & 2 \\ 9 & 3 \end{bmatrix}$$

then find a matrix y such that
 $2A - 2y = 4B$.

3

Or

- (b) (i) A bookseller has in stock 10 dozen English books, 12 dozen Business Mathematics books and 15 dozen Book-keeping books. Suppose the selling prices are ₹ 50, ₹ 150 and ₹ 250 per English, Business Mathematics and Book-keeping book respectively. Find the total amount that the bookseller will get by selling all his stocks by using matrix multiplication.

5

(ii) If

$$A = \begin{bmatrix} 2 & 4 \\ 6 & 7 \end{bmatrix}$$

then prove that $(A^{-1})^{-1} = A$.

4

(4)

3. (a) (i) Distinguish between determinants and matrices. 4

(ii) Evaluate the following : 5

$$\begin{vmatrix} 4 & 6 & 10 \\ 3 & 7 & -3 \\ 4 & 2 & 5 \end{vmatrix}$$

Or

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

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

(ii) Solve the following using determinants : 3

$$2x - 2y = 3$$

$$x + 4y = -4$$

4. (a) Discuss various kinds of computer language. 9

Or

(b) Discuss various protocols used in an internet. 9

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

Or

(b) Explain various generations of computer. 9
