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(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

$$x + y + z = 3$$

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

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

(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 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

(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

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

2017

(5th Semester)

COMMERCE

Paper No. : BC-503

(Business Mathematics and Computer Application)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

1. Fill in the blanks : 1×5=5

(a) The number of rows and columns of a determinant should always be

.....

(b) In a matrix, if $AB = BA$, it is known as

.....

(c) The method of obtaining the derivative of a composite function is known as

.....

(d) computer uses binary codes 0 and 1 to represent the information.

(e) is India's telecom gateway to the world.

2. Indicate whether the following statements are True (T) or False (F) by putting a Tick (✓) mark :

1×5=5

(a) Sarrus method is used for all types of order.

(T / F)

(b) .The diagonal of a skew-symmetric matrix is zero.

(T / F)

- (c) The method of finding the derivative of a function applying the definition of derivative is also known as delta method.

(T / F)

- (d) ALU stands for Arithmetic and Logic Unit.

(T / F)

- (e) Train topology is one of the most commonly used topologies in multinational organizations.

(T / F)

3. Tick (✓) the correct answer in the brackets provided :

1×5=5

- (a) Determinant is a method which is used by

(i) business organizations ()

(ii) economists ()

(iii) Both (i) and (ii) ()

(iv) None of the above ()

- (b) A matrix is orthogonal, if

(i) $A'A = I$ ()

(ii) $A^2 = A$ ()

(iii) $A'A = A$ ()

(iv) $A = 0$ ()

(c) E-service can be defined as

(i) $E\text{-service} = E\text{-commerce} + E\text{-business}$ ()

(ii) $E\text{-service} = E\text{-commerce} - E\text{-business}$ ()

(iii) $E\text{-service} = E\text{-commerce} \times E\text{-business}$ ()

(iv) $E\text{-service} + E\text{-commerce} = E\text{-business}$ ()

(d) A tree topology combines the characteristics of

(i) bus and star ()

(ii) bus and hybrid ()

(iii) ring and bus ()

(iv) ring and star ()

(e) When a variable is changed by differentiation keeping other variables constant, it is known as

(i) partial derivative ()

(ii) chain rule ()

(iii) Euler's theorem ()

(iv) division method ()

SECTION—II

(Marks : 10)

4. Answer the following questions : 2×5=10

(a) Write any two properties of determinant.

(b) Construct an $m \times n$ matrix.

- (c) Calculate the average revenue function at $q = 5$, for the total revenue function, $R = 15 + 10q + q^2$.

(d) Explain any two harmful effects of a computer.

(e) What do you mean by a binary number system?
