

2023

(5th Semester)

COMMERCE

Paper No. : 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) Solve the following system by linear equations : 9

$$x - 3y + z = -1$$

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

$$6x - 7y + 8z = 7$$

Or

- (b) (i) Find the value of the following determinant by Sarrus method : 5

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

- (ii) State the four properties of determinants. 4

2. (a) 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

Or

(b) Find the inverse of

$$A = \begin{bmatrix} 2 & 3 & -5 \\ 4 & 1 & 7 \\ 6 & 2 & 0 \end{bmatrix}$$

3. (a) (i) Evaluate $\lim_{x \rightarrow \infty} \frac{x - 5x^2 - 10x^3}{3 - x - 4x^2}$. 4

(ii) A steel plant produces x tons of steel per week at a total cost of ₹ $\left(\frac{1}{3}x^3 - 5x^2 + 99x + 35\right)$. Find the output at which marginal cost attains its minimum. 5

Or

(b) Find the maximum and minimum values of $y = 2x^3 - 3x^2 + x - 20$. 9

4. (a) State and discuss the various areas where the computer applications are used. 9

Or

- (b) Discuss the various types of protocols used in Internet.

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

Or

- (b) Write notes on the following : 5+4=9

- (i) Importance of e-commerce
- (ii) Drawbacks of an Internet

★ ★ ★

2023

(5th Semester)

COMMERCE

Paper No. : BC-503

(Business Mathematics and Computer Applications)

(PART : A—OBJECTIVE)

(Marks : 25.)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

1. Indicate whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark : 1×5=5

(a) If two rows or two columns of a determinant are identical, the value of determinant is unity.

(T / F)

(b) A square matrix A is called an orthogonal matrix if $A^2 = A$.

(T / F)

(c) The derivative of a constant function is zero.

2023

(T / F)

(5th Semester)

(d) The unit of a computing system which performs all numerical and logical operations is called control unit.

(T / F)

Business Mathematics and Computer Applications

(e) CPU is considered as the heart of the computer system.

(Marks : 25)

(T / F)

The figures in the margin indicate full marks for the questions

2. Choose the correct answer and place its code in the brackets provided : (Marks : 15) 1x10=10

(a) A square matrix A is called a singular matrix if

(i) $|A| = 0$

(ii) $A^2 = A$

(iii) $A^2 = I$

(iv) $|A| = I$

[]

(b) The cofactor of a_{32} of

$$\begin{vmatrix} 2 & 4 & 6 \\ 3 & 0 & -1 \\ 4 & -4 & 2 \end{vmatrix}$$

is

(i) -4

(ii) -20

(iii) 20

(iv) 24

(c) Matrix addition is

(i) only commutative

(ii) only associative

(iii) both commutative and associative

(iv) neither commutative nor associative

(d) The derivative of x^{-2} with respect to x is

(i) $-2x^{-1}$

(ii) $-2x^{-2}$

(iii) $-2x^{-3}$

(iv) $2x$

(e) If A is an invertible square matrix, then

(i) $(\text{adj } A)' = \text{adj } A'$

(ii) $(\text{adj } A)^{-1} = \text{adj } A^{-1}$

(iii) $AA^{-1} = A^{-1}A = I$

(iv) All of the above

(5)

(f) A system of linear equations $AX = B$ is consistent and has a unique solution if

(i) $|A| \neq 0$

(ii) $|A| = 0$ and $(\text{adj } A)B \neq 0$

(iii) $|A| = 0$ and $(\text{adj } A)B = 0$

(iv) $(\text{adj } A)B = 0$

(g) The binary equivalent of the decimal number 13 is

(i) 1101

(ii) 1011

(iii) 1110

(iv) 111

(h) A byte is a group of

- (i) 4 bits
- (ii) 6 bits
- (iii) 8 bits
- (iv) 2 bits

(i) Hexadecimal number system uses the base of

- (i) 2
- (ii) 8
- (iii) 10
- (iv) 16

(j) The machine-independent program is

- (i) high-level language
- (ii) low-level language
- (iii) assembly language
- (iv) machine language

(7)

SECTION—II

(Marks : 10)

2×5=10

3. Answer/Write on any *five* of the following :

(a) Distinguish between matrix and determinant.

(b) Operating System (OS)

(Marks : 10)

3. Answer/Write on any five of the following : 3x5=15

(a) Distinguish between matrix and determinant.

Ans : (a)

Ans : (a)

(b) Hierarchical structure of operating system.

Ans : (b)

Ans : (b)

Ans : (b)

Ans : (b)

(c) The machine-independent processor is

(i) High-level language

(ii) Low-level language

(iii) Assembly language

(iv) Machine language

(c) Bus topology

(a) Compiler

(d) Compiler System (OS)

(c) Bus topology

(e) Identity matrix

[Faint, illegible text]

(12)

(f) Evaluate $\lim_{x \rightarrow 5} \frac{\sqrt{x} - \sqrt{5}}{x - 5}$.

Identify matrix (9)

(g) E-commerce
