2021

(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) :

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

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

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

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

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

(ii) Find the inverse of a matrix

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

Or

(b) If

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

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

3. *(a)* *(i)* Evaluate :

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

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

Or

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

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

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

Or

(b) Discuss various areas of computer application.

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

Or

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

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2021

(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) Matrices are now-a-days applied in all disciplines.

(T / F)

(b) The concept of limit is the base of calculus.

(T / F)

(c) Binary number system uses 10 as base.

(T / F)

(d) The derivative of a constraint function is zero.

(T / F)

(e) The fifth generation of computers is working on the concept of Artificial Intelligence.

(T / F)

2. Choose the correct answer and place its code in the brackets provided : 1×10=10

(a) The value of $\begin{vmatrix} 2 & 4 \\ 5 & 6 \end{vmatrix}$ is

(i) 8

(ii) –8

(iii) –2

(iv) 2 [ ]

(b) A square matrix in said to be singular, if $|A|$ is equal to

(i) zero

(ii) 1

(iii) -1

(iv) None of the above [ ]

(c) The co-factor of a_{12} in $\begin{vmatrix} 2 & 5 \\ 6 & 7 \end{vmatrix}$ is

(i) $+6$

(ii) -6

(iii) $+7$

(iv) -7 [ ]

(d) The derivative of x^n is

(i) x^{n-1}

(ii) nx^{n-1}

(iii) $\frac{1}{x^n}$

(iv) zero [ ]

(e) A BYTE is a group of

(i) 4 bits

(ii) 6 bits

(iii) 8 bits

(iv) 10 bits [ ]

(f) A personal computer is categorized in

(i) mini computer

(ii) microcomputer

(iii) mainframe computer

(iv) supercomputer [ ]

(g) Which of the following is machine-independent program?

(i) High Level Language

(ii) Low Level Language

(iii) Assembly Language

(iv) Machine Language [ ]

(h) Which of the following types of computer is the fastest?

(i) Mini computer

(ii) Microcomputer

(iii) Mainframe computer

(iv) Supercomputer [ ]

(i) The translator program used in assembly language is called

(i) compiler

(ii) interpreter

(iii) assembler

(iv) translator [ ]

(j) OS stands for

(i) Open Software

(ii) Optical Sensor

(iii) Operating System

(iv) Ordered Software [ ]

SECTION—II

(*Marks* : 10)

3. Answer/Write on the following (any *five*) .

(a) Distinguish between LAN and WAN.

(b) Shortcomings of online shopping

(c) Evaluate the limit of

$$\lim_{x \to 3} \frac{x^2 - 2x - 3}{x - 3}$$

(d) State any two properties of determinants.

(e) Identity matrix

(f) Operating system

(g) Euler's theorem

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