2019

(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)* *(i)* Find the value of determinant by Sarrus method

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

(ii) Prove that

$$\begin{vmatrix} b+c & c+a & a+b \\ q+r & r+p & p+q \\ y+z & z+x & x+y \end{vmatrix} = 2 \begin{vmatrix} a & b & c \\ p & q & r \\ x & y & z \end{vmatrix}$$ 6

Or

(b) *(i)* Find the value of x if the area of a triangle is 6 sq. units and vertices are $(x, 0)$, $(5, 0)$ and $(0, 4)$ using determinant. 4

(ii) Solve the following system of linear equations : 5

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

2. *(a)* *(i)* Find the sum and product of the following two matrices A and B : 2+3=5

$$A = \begin{bmatrix} 4 & -1 & 2 \\ 6 & 4 & 8 \\ -5 & 0 & 9 \end{bmatrix} \text{ and } B = \begin{bmatrix} 3 & 7 & 9 \\ -6 & 0 & 5 \\ 2 & 4 & 9 \end{bmatrix}$$

(ii) If $A = \begin{bmatrix} 5 & 7 \\ 6 & 3 \end{bmatrix}$, prove that 4

$$A(\text{adj}A) = (\text{adj}A)A = |A|I_2$$

Or

(b) *(i)* If $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$, find a matrix B such that $AB = I$. 4

(ii) Examine the consistency of the system of equations $x + y + z = 6$, $x + 2y + 3z = 14$ and $x + 4y + 7z = 30$. 5

3. *(a)* *(i)* Evaluate the limit of

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

3

(ii) Differentiate with respect to x for the following : 3+3=6

$$y = \frac{7x^5}{\log x} \text{ and } y = x^x$$

Or

(b) *(i)* A radio manufacturer produces x sets per week at a total cost of ₹ $(x^2 + 78x + 2{,}500)$. He is a monopolist and demand function for his product is $x = \frac{600 - P}{8}$, where the price is ₹ P per set. Show that the maximum net revenue (i.e., profit) is obtained when 29 sets are produced per week. 6

(ii) Calculate the first-order partial derivatives of $U = 2x^4 + 5xy + 3y^4$. 3

4. *(a)* Discuss the components of computer system with block diagram. 9

Or

(b) State and discuss the various areas where the computer applications are used.

5. *(a)* Discuss the following : 9

(i) Features of E-commerce

(ii) Client/Server interactions

Or

(b) Discuss the various types of computer networking.

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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) Matrix has got no numerical value.

(T / F)

(b) Inverse of a matrix, if it exists, is unique.

(T / F)

(c) The derivate of a constant function is unity.

(T / F)

(d) Intranet is basically described as 'mini Internet'.

(T / F)

(e) A byte can be either 0 or 1.

(T / F)

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

(a) A computer which is linked to a computer network is referred to as

(i) host computer

(ii) channel

(iii) workstation

(iv) protocol [ ]

(b) Hexadecimal number system is used with base

(i) 2

(ii) 8

(iii) 10

(iv) 16 [ ]

(c) The process of finding the derivative of a function is known as

(i) chain rule

(ii) Euler's theorem

(iii) delta method

(iv) differentiation [ ]

(d) The binary equivalent of 13 is

(i) 1011

(ii) 1100

(iii) 1010

(iv) 1101 [ ]

(e) The statement '$x \to a$' means

(i) $x = a$

(ii) $x \neq a$

(iii) $x > a$

(iv) $x < a$ [ ]

(f) The value of the determinant $\begin{vmatrix} 25 & 4 \\ -9 & 1 \end{vmatrix}$ is

(i) 11

(ii) 61

(iii) -11

(iv) 31 [ ]

(g) Transpose of a rectangular matrix is a

(i) rectangular matrix

(ii) diagonal matrix

(iii) square matrix

(iv) scalar matrix [ ]

(h) log10 is equal to

(i) –1

(ii) 0

(iii) 1

(iv) 2 [ ]

(i) In what respect human beings are superior to computers?

(i) Diligence

(ii) Slavery

(iii) Intelligence

(iv) Reliability [ ]

(j) To join the Internet, the computer has to be connected to

(i) Internet architecture board

(ii) Internet service provider

(iii) Internet society

(iv) None of the above [ ]

SECTION—II

(*Marks* : 10)

3. Answer/Write on the following : 2×5=10

(a) Find the value of x, if

$$\begin{vmatrix} 2 & 4 \\ 5 & 6 \end{vmatrix} = \begin{vmatrix} 9x & 5 \\ 5x & 6 \end{vmatrix}$$

(b) Show that $A^2 - 2A$, if $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$.

(c) If

$$f(x, y) = \frac{x^3 y^3}{x + y}$$

find the homogeneous.

(d) Binary number system

(e) Star topology

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20L—1500