

2016

(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) If x, y, z are different and if

$$\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0$$

prove that $xyz = -1$.

6

(ii) Find the value of K , if

$$\begin{vmatrix} 4K & 8 \\ 6 & K \end{vmatrix} = \begin{vmatrix} 2 & 4 \\ 5 & 4 \end{vmatrix} \quad 3$$

Or

(b) (i) Find the area of the triangle with vertices at the points $(2, 0)$, $(5, 0)$ and $(3, 4)$ by using determinant. 5

(ii) Find the product by using multiplication of determinant

$$\begin{vmatrix} 2 & 1 & 3 \\ 1 & 3 & 4 \\ 3 & 2 & 1 \end{vmatrix} \text{ and } \begin{vmatrix} 3 & 4 & 7 \\ 2 & 1 & 3 \\ -5 & -1 & 2 \end{vmatrix} \quad 4$$

2. (a) (i) If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$
show that $(aI + bC)^3 = a^3I + 3a^2bC$. 5

(ii) Let $f(x) = x^2 - 5x - 14I$. Show that $f(A) = 0$, if

$$A = \begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix}$$

where I is the unit matrix of order 2 and 0 is the zero matrix of order 2. 4

Or

- (b) (i) Divide ₹ 3,000 in two parts such that the total annual interest at 5% on the 1st part and 4% on the 2nd part amounts to ₹ 145 by using matrix multiplication. 5

- (ii) Solve the following by using matrix method : 4

$$2x + 3y = 9$$

$$3x + 5y = 12$$

3. (a) (i) Verify Euler's theorem for

$$U = x^3 - x^2y + 2xy^2 - y^3$$
 6

- (ii) Find $\frac{dy}{dx}$ of $y = \log(3x + 1)$. 3

Or

- (b) The total cost $C(x)$ of a firm is given by

$$C(x) = 0.005x^3 - 0.2x^2 - 30x + 2000$$

where x is the output.

Determine the following : 3+3+3=9

- (i) The average cost
 (ii) The marginal average cost
 (iii) The marginal cost

4. (a) Discuss the various components of a computer system. 9

Or

- (b) Write the features and advantages of UNIX. 4+5=9

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

Or

- (b) Write short notes on the following : 4½+4½=9

(i) Internet

(ii) E-commerce

2016

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

.....

(b) A square matrix A is called an involutory if

.....

(c) The concept of limit is the base of

.....

(d) The unit of a computing system which performs all mathematical and logical operations is the

.....

(e) is a folder in which deleted files are stored.

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

$$1 \times 5 = 5$$

(a) Determinant has got no numerical value.

(T / F)

(b) Matrix multiplication is not distributive with respect to addition of matrices.

(T / F)

- (c) The derivative of a constant function is 1.
(T / F)
- (d) BYTE stands for binary digit and can be either 0 or 1.
(T / F)
- (e) Intranet is an international network of networks.
(T / F)

3. Tick (✓) the correct answer in the brackets provided :
1×5=5

- (a) Matrix addition is
- (i) only commutative ()
 - (ii) only associative ()
 - (iii) both commutative and associative ()
 - (iv) not commutative and associative ()
- (b) The method of finding the derivative of a function applying the definition of derivative is named as the
- (i) delta method ()
 - (ii) chain rule ()
 - (iii) logarithmic differentiation ()
 - (iv) None of the above ()

(c) A square matrix A is called singular, if

(i) $|A| = 0$ ()

(ii) $|A| \neq 0$ ()

(iii) $A^2 = 0$ ()

(iv) $A^2 = A$ ()

(d) Control unit is the part of

(i) CPU ()

(ii) input ()

(iii) output ()

(iv) ALU ()

(e) 'Hex' number system has a radix of

(i) 2 ()

(ii) 8 ()

(iii) 10 ()

(iv) 16 ()

(5)

SECTION—II

(Marks : 10)

4. Write short notes on/Answer the following : $2 \times 5 = 10$

(a) Distinguish between determinants and matrices.

(b) Euler's theorem

(c) If $f(x) = b \left(\frac{x-a}{b-a} \right) + a \left(\frac{x-b}{a-b} \right)$, prove that
 $f(a+b) = a+b$.

(d) Importance of E-com

(e) I-P-O cycle
