24U117S (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - UG)

CC19U BCA1 C01 - MATHEMATICAL FOUNDATION OF COMPUTER APPLICATION

(Mathematics - Complementary Course)

(2019 to 2023 Admissions - Supplementary/Improvement)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. Find $5A$, if $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$
2. Define Diagonal Matrix
3. Prove that $A - A^T$ is Skew Symmetric
4. Write $-5x + 7y = 2; 2x - 3y = -1$ in matrix form
5. Using Cramer's Rule, solve:
   $2x - y = 3$
   $x + 3y = -2$
6. Find the value of $\begin{vmatrix} 1 & 0 & 0 \\ 2 & 3 & 0 \\ 1 & 2 & 3 \end{vmatrix}$
7. Give the expression for A^{-1}
8. Find $|\bar{a}|$,if $\bar{a} = -5\bar{i} - 4\bar{j} + \bar{k}$
9. Evaluate $\lim_{t \to 6} 8(t-5)(t-7)$
10. Find $\frac{dy}{dx}$, if $y = x + \frac{1}{x}$
11. Evaluate $\int_a^b x^3 dx$
12. Evaluate $\int_0^1 x dx$

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** questions. Each question carries 5 marks.

13. Using Gauss-Jordan Elimination method,solve
    $x + y + z = 4$
    $2x + 5y - 2z = 3$

14. Check the dependency of $v_1 = [1 \quad 9 \quad 9 \quad 8]$, $v_2 = [2 \quad 0 \quad 0 \quad 3]$ and $[2 \quad 0 \quad 0 \quad 8]$

15. Find the eigen values of the matrix

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

16. Find $\frac{dy}{dx}$ by using first principle,if $y = x^3 - x$

17. Find $\frac{dy}{dx}$,if $y = \frac{x^2 - 1}{x^2 + x - 2}$

18. Evaluate $\int (x^{3/2} + 2e^x - \frac{1}{x})dx$

19. Evaluate $\int \frac{dx}{(x-1)(x-3)}$

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

20. (a) Find the rank of the matrix $A = \begin{pmatrix} 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \\ 2 & 1 & 3 & 1 \end{pmatrix}$

(b) Find the rank of the matrix $A = \begin{pmatrix} 1 & 2 & -3 \\ 2 & 5 & -4 \end{pmatrix}$

21. (a) Find $\frac{dy}{dx}$, if $y = cos(sinx)$

(b) Find $\frac{dy}{dx}$, if $y = sec(tan(\sqrt{x}))$

(1 × 10 = 10 Marks)

****