QP Code: D 112475	**Total Pages: 2**	**Name:**
		Register No.

FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2024

(CUFYUGP)

BCA1MN101 - Mathematical Foundation for Computer Applications

2024 Admission onwards

Maximum Time :2 Hours	**Maximum Marks :70**

Section A

All Question can be answered. Each Question carries 3 marks (Ceiling : 24 Marks)

1	For $A = \begin{bmatrix} 1 & -1 \\ 3 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 1 & 4 \end{bmatrix}$ find $5A - 2B$.
2	Evaluate A^3 for $A = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$
3	Check whether the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 3 \\ 1 & 2 & 4 \end{bmatrix}$ is singular or not?
4	Find $(i + 3j + k).(4i - j + 2k)$
5	Find $\lim_{x \to 3} \frac{x-3}{x^2-9}$
6	Find the characteristic equation of $A = \begin{bmatrix} -3 & 1 \\ 2 & 0 \end{bmatrix}$
7	Find the derivative of $\frac{x-3}{x-5}$
8	Find $\int_0^2 x^3 - 6x^2 + 6\ dx$
9	Evaluate $\int x\, e^x dx$
10	Find $\int \sqrt{2x+1}\, dx$

Section B

All Question can be answered. Each Question carries 6 marks (Ceiling : 36 Marks)

11	Find the inverse of $A = \begin{bmatrix} 2 & 3 & 6 \\ 3 & -6 & 2 \\ -6 & -2 & 3 \end{bmatrix}$
12	If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ -1 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 2 & -1 \\ 1 & 3 & 4 \\ 0 & -2 & -3 \end{bmatrix}$ find the products AB and BA. Show that $AB \neq BA$.
13	Find the vector perpendicular to the vectors $2i - j + k$ and $3i + 4j - k$
14	Solve using Gauss Jordan Elimination method $x + y + 3z = 0, 3x + 4y + 4z = 0, 7x + 10y + 12z = 0$
15	Differentiate $e^x \log(Sin\, 2x)$
16	Find $\frac{dy}{dx}$ if $y = x^{Sin\, x}$
17	Evaluate $\int_1^3 \frac{dx}{(x+2)(x+3)}$
18	Evaluate $\int \frac{2z}{\sqrt[3]{z^2+1}}\, dz$

Section C	
Answer any ONE .Each Question carries 10 marks (1x10=10 Marks)	
19	Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$
20	Find the derivative of (a) $y = xe^{-x} + e^{x^3}$ (b) $y = \ x\tan(2\sqrt{x}) + 7\log 3x$