

QP Code:D132578		Total Pages: 2		Name:	
				Register No.	
FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025					
(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	Define symmetric and skew symmetric matrix using examples.				
2	For $A = \begin{bmatrix} 1 & -1 \\ 3 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 1 & 4 \end{bmatrix}$ find $3A - 2B$.				
3	Define augmented matrix				
4	Let $u = -i - 2j + k$ and $v = 4i + 7j$. Find $3u - 2v$				
5	Find the characteristic equation of $A = \begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$				
6	Find $\lim_{x \rightarrow 3} \frac{x-3}{x^2-9}$				
7	Find the derivative of $(x-1)(x-5)$				
8	Evaluate $\int x e^x dx$				
9	Find $\int \frac{2x}{1+x^2} dx$				
10	Find $\int_{-2}^2 x^4 - 4x^2 + 6 dx$				
Section B					
All Question can be answered. Each Question carries 6 marks (Ceiling : 36 Marks)					
11	If $A = \begin{bmatrix} 1 & 3 & 0 \\ -1 & 2 & 1 \\ 0 & -2 & -3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 & 4 \\ 1 & 2 & 3 \\ -1 & 1 & 2 \end{bmatrix}$ compute AB and BA . Check whether $AB = BA$ or not.				
12	Find the inverse of $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$				
13	Solve using Gauss Jordan Elimination method $x + y + z = 3, x + 2y + 3z = 4, x + 4y + 9z = 6$				
14	Find a vector perpendicular to the plane $P(1, -1, 0), Q(2, 1, -1)$ and $R(-1, 1, 2)$				
15	Find $\frac{dy}{dx}$ if $y = x^4 + x \sin x + e^x$				
16	Find the derivative of e^x using first principle.				
17	Find $\int x\sqrt{2x+1} dx$				
18	Evaluate $\int_{-1}^1 3x^2\sqrt{x^3+1} dx$				

Section C	
Answer any ONE .Each Question carries 10 marks (1x10=10 Marks)	
19	Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$
20	Find the derivative (a) $y = (x \sin x)^3$ (b) $y = e^x \log (2 + x^3)$