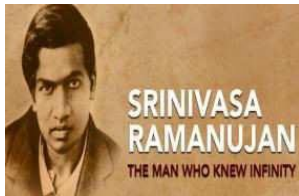
	SRM Institute of Science and Technology Kattankulathur		
	DEPARTMENT OF MATHEMATICS		
	18MAB101T Calculus and Linear Algebra		
	UNIT –I Matrices		
Sl.No.	Tutorial Sheet -2	Answers	
Part – A			
1	Verify Cayley Hamilton theorem and find A^4 when $A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$.	$A^4 = \begin{bmatrix} 25 & 0 \\ 0 & 25 \end{bmatrix}$	
2	Two eigen values of the matrix $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ are equal to 1 each. Find the eigen values of A^{-1}	$A = 1, 1, 5$ $A^{-1} = 1, 1, 1/5$	
3	The matrix A is $\begin{bmatrix} -1 & 0 & 0 \\ 2 & -3 & 0 \\ 1 & 4 & 2 \end{bmatrix}$. Find the eigen values of A^2	$A = -1, 3, 2$ $A^2 = 1, 9, 4$	
4	Verify Cayley Hamilton theorem and find A^{-1} when $A = \begin{bmatrix} 3 & 1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$.	$A^{-1} = 1/20 \begin{bmatrix} 7 & -2 & -3 \\ 1 & 4 & 1 \\ -2 & 2 & 8 \end{bmatrix}$	
5	Verify Cayley Hamilton theorem and find A^{-1} when $A = \begin{bmatrix} 1 & -1 & 1 \\ 0 & 1 & 0 \\ 2 & 0 & 3 \end{bmatrix}$	$A^{-1} = \begin{bmatrix} 3 & 3 & -1 \\ 0 & 1 & 0 \\ -2 & -2 & 1 \end{bmatrix}$	
6	Obtain the matrix $A^6 - 25A^2 + 122A$ where $A = \begin{bmatrix} 0 & 0 & 2 \\ 2 & 1 & 0 \\ -1 & -1 & 3 \end{bmatrix}$.	Ans $\begin{bmatrix} -34 & 0 & -20 \\ -20 & -54 & 0 \\ 10 & 10 & -74 \end{bmatrix}$	
7	If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, Prove that $A^3 - 3A^2 - 9A - 5I = 0$. Hence find A^4 and A^{-1} .	$A^4 = \begin{bmatrix} 209 & 208 & 208 \\ 208 & 209 & 208 \\ 208 & 208 & 209 \end{bmatrix}$	
8	Diagonalise the matrix $A = \begin{bmatrix} 2 & 1 & -1 \\ 1 & 1 & -2 \\ -1 & -2 & 1 \end{bmatrix}$ when	$A^{-1} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 4 \end{bmatrix}$	