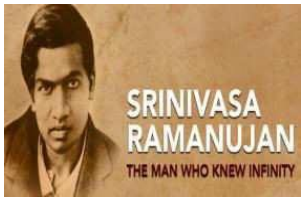
	SRM Institute of Science and Technology Kattankulathur	
	DEPARTMENT OF MATHEMATICS	
	18MAB101T Calculus and Linear Algebra	
	UNIT –I Matrices	

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	$A^{-1} = \begin{bmatrix}1 & 0 & 0\\ 0 & -1 & 0\\ 0 & 0 & 4\end{bmatrix}$