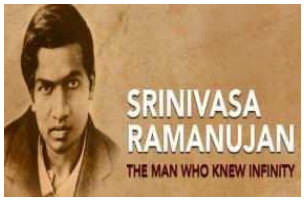
	SRM Institute of Science and Technology Kattankulathur	
	DEPARTMENT OF MATHEMATICS	
	18MAB101T Calculus and Linear Algebra	
	UNIT –I Matrices	

Sl.No.	**Tutorial Sheet -1**	**Answers**
	Part – A	
1	**If A=** $\begin{pmatrix} 3 & 5 & 3 \\ 0 & 4 & 6 \\ 0 & 0 & 1 \end{pmatrix}$ **, find the eigenvalues of (i) A (ii) A^{-1} (iii) adj A (iv) A^3**	**(i) 3,4,1 (ii) 1/3, ¼, 1 (iii) 12, 4, 3 (iv) 27, 64, 1**
2	**Two of the eigenvalues of A=** $\begin{pmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{pmatrix}$ **are 1 and 2. Find the eigenvalues of A^2.**	**1, 4, 9**
3	**Find the sum and product of the eigenvalues of the matrix A=** $\begin{pmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{pmatrix}$	**-1, 45**
4	**Find the eigenvalues and eigenvectors of the matrix A=** $\begin{pmatrix} 4 & 1 \\ 3 & 2 \end{pmatrix}$	**1, 5** $\begin{pmatrix} 1 \\ -3 \end{pmatrix}, \begin{pmatrix} 1 \\ 1 \end{pmatrix}$
5	**Find the characteristic equation of A=** $\begin{pmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{pmatrix}$	**$\lambda^3-11\lambda^2+36\lambda-36=0$**
	Part – B	
6	**Find the eigenvalues and eigenvectors of** $\begin{pmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{pmatrix}$	**2, 3, 5** $\begin{pmatrix} -1 \\ 1 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 3 \\ 2 \\ 1 \end{pmatrix}$
7	**Find the eigenvalues and eigenvectors of** $\begin{pmatrix} 2 & 1 & 1 \\ 2 & 3 & 2 \\ 3 & 3 & 4 \end{pmatrix}$	**1, 1, 7** $\begin{pmatrix} 0 \\ 1 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$
8	**Find the eigenvalues and eigenvectors of** $\begin{pmatrix} 6 & -6 & 5 \\ 14 & -13 & 10 \\ 7 & -6 & 4 \end{pmatrix}$	**-1, -1, -1** $\begin{pmatrix} 0 \\ 5 \\ 6 \end{pmatrix}, \begin{pmatrix} 5 \\ 0 \\ -7 \end{pmatrix}, \begin{pmatrix} 6 \\ 7 \\ 0 \end{pmatrix}$

9	**Find the eigenvalues and eigenvectors of** $\begin{pmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{pmatrix}$	**0, 3, 15** $\begin{pmatrix} 1 \\ 2 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 1 \\ -2 \end{pmatrix}, \begin{pmatrix} 2 \\ -2 \\ 1 \end{pmatrix}$
10	**Find the eigenvalues and eigenvectors of** $\begin{pmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{pmatrix}$	**8, 2, 2** $\begin{pmatrix} 2 \\ -1 \\ 1 \end{pmatrix}, \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$