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APPLIED MATHEMATICS-1(BAS-101)
(MATRICES)
TUTORIAL SHEET -1

Q.1 Determine the rank of the matrix $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$

Q2.Reduce the matrix in into its normal form and hence find its rank

$$\begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & -1 \end{bmatrix}$$

Q3.For $A = \begin{bmatrix} 2 & 1 & -3 & -6 \\ 3 & -3 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$

Find non singular matrices P and Q such that PAQ is in the normal form.

Q.4 Use Gauss-Jordan method to find the inverse of the matrix

$$\begin{bmatrix} 8 & 4 & 3 \\ 2 & 1 & 1 \\ 1 & 2 & 1 \end{bmatrix}$$

Q.5 Reduce the matrix to its row echelon form and find its rank

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 5 \\ 1 & 5 & 5 & 7 \\ 8 & 1 & 14 & 17 \end{bmatrix}$$

Q.6 If A and B are Hermitian, show that $AB - BA$ is a skew-Hermitian.

Q.7 Express the matrix $A = \begin{bmatrix} 3 & 1 & -2 \\ 2 & 1 & 7 \\ -4 & 5 & 3 \end{bmatrix}$ as sum of two matrices,one symmetric and one Skew- symmetric.

Q.8 Using Gauss-Jordan method,find the inverse of the matrix $\begin{bmatrix} -1 & 1 & 2 \\ 3 & -1 & 1 \\ -1 & 3 & 4 \end{bmatrix}$