

Q.1) Solve the following (1 mark each)

1) Find the rank of  $\begin{bmatrix} 2 & 3 & 1 & 4 \\ 1 & 2 & 2 & 3 \\ 0 & -1 & -3 & -2 \end{bmatrix}$

2) Find the rank of  $\begin{bmatrix} 1 & 3 & 8 & 6 \\ 2 & 6 & -1 & 4 \\ 3 & 9 & 7 & 10 \end{bmatrix}$

3) Find normal form of  $\begin{bmatrix} 3 & 1 & 2 & 1 \\ 2 & 0 & 3 & 2 \\ 1 & 2 & 3 & 4 \\ 3 & 1 & 4 & 1 \\ 2 & 4 & 6 & 8 \end{bmatrix}$

Q.2) Fill in the blanks

1) If the matrix A have at least one minor of order 3 is non-zero & every minor of order 4 zero then rank of A is.....

2) By performing elementary operations if any non-zero matrix A of order  $4 \times 4$  is reduced to the normal form  $\begin{bmatrix} I_4 & 0 \\ 0 & 0 \end{bmatrix}$  then rank of A is .....

3) Normal form of  $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$  is.....

4) When a system of equations have infinitely many solutions.....