

## \* IMPORTANT ELEMENTARY OPERATION OF A MATRIX $\Rightarrow$

(i) The interchange of any two rows or two columns  $\Rightarrow$   
Symbolically interchange of  $i^{\text{th}}$  and  $j^{\text{th}}$  rows denoted by  $R_i \leftrightarrow R_j$   
and interchange of  $i^{\text{th}}$  and  $j^{\text{th}}$  columns denoted by  $C_i \leftrightarrow C_j$

(ii) The multiplication of the elements of any row or column by a non-zero number  $\Rightarrow$   
Symbolically, multiplication of each element of  $i^{\text{th}}$  row by  $K$  ( $K \neq 0$ ) is denoted by  $R_i \rightarrow KR_i$

The corresponding column operation is denoted by  $C_i \rightarrow KC_i$

(iii) The addition to the elements of any row or column, the corresponding elements of any other row or column multiplied by any non-zero number  $\Rightarrow$

Symbolically, the addition to the elements of  $i^{\text{th}}$  row, the corresponding elements of  $j^{\text{th}}$  row multiplied by  $K$

denoted by  $R_i \rightarrow R_i + KR_j$

The corresponding column operation is denoted by

$C_i \rightarrow C_i + KC_j$

\*\* Overdetermined system  $\Rightarrow$  No. of unknowns  $<$  No. of equations  
\*\* Underdetermined system  $\Rightarrow$  No. of unknowns  $>$  No. of equations