

Section 1

Ans-3

(i) Scaling :-

$$S = \begin{bmatrix} S_x & 0 & 0 \\ 0 & S_y & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} A' \\ B' \\ C' \\ D' \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 3 & 0 \\ 2 & 0 & 2 & 2 \end{bmatrix}$$

$$S_x = 2$$

$$S_y = 3.$$

(ii) Rotate $+5^\circ$ anticlockwise

$$\theta = 45^\circ$$

$$\begin{bmatrix} A' \\ B' \\ C' \\ D' \end{bmatrix} = \begin{bmatrix} \cos \theta & \sin \theta & 0 \\ -\sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

(iii) Translate $T_x = 3$ $T_y = 5$

$$[x' \ y' \ 1] = [x \ y \ 1] = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ T_x & T_y & 1 \end{bmatrix}.$$