

$$(i) x[n] = \left(\frac{-1}{5}\right)^n u[n] + 5 \left(\frac{1}{2}\right)^n u[-n-1]$$

$$(ii) x[n] = 2^n u[-n-1]$$

[10]

$$(iii) x[n] = (n+1)u[n]$$

Q. 7 a) Using suitable method obtain state transition matrix for the system matrix.

$$\begin{bmatrix} 3/4 & 0 \\ -1/2 & 1/2 \end{bmatrix}$$

[10]

b) Determine state variable model of

$$y[n] = -2y[n-1] + 3y[n-2] + 0.5y[n-3] + 2x[n]$$

[10]