

Task -3 (18 Nov 2024)

1. a) Briefly explain stochastic process and its classification with example.

b) Show that the vector (y,x) is a fixed point of the stochastic matrix

$$\begin{bmatrix} 1-x & x \\ y & 1-y \end{bmatrix}$$

2. a) Define probability vector, regular stochastic matrix, fixed probability vector.

b) Prove that with reference to the two second order stochastic matrices that their product is also a stochastic matrix

3. a) Define Markov Chain, absorbing state, Recurrent state, Transient state

b) Find the fixed probability vector for the regular stochastic matrix

$$\begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ \frac{1}{6} & \frac{1}{2} & \frac{1}{3} \\ 0 & \frac{2}{3} & \frac{1}{3} \end{bmatrix}$$