

- b) There are three typist in a company, each typist can type an average of 6 letters per hour. If letters arrive for being typed at the rate of 15 letters per hour.
- What fraction of time all the typists are busy?
 - What is the average number of letters waiting to be typed. (8)

Unit - IV

7. a) Write a short note on Markov Process. (8)
- b) Determine the nature of the states of the Markov chain with the following transition Probability matrix. (8)

$$P = \begin{matrix} & \begin{matrix} 0 & 1 & 2 \end{matrix} \\ \begin{matrix} 0 \\ 1 \\ 2 \end{matrix} & \begin{bmatrix} 0 & 1 & 0 \\ \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 1 & 0 \end{bmatrix} \end{matrix}$$

OR

8. a) Two products A & B has equal popularity. If their transition matrix be

$$P = \begin{matrix} & \begin{matrix} A & B \end{matrix} \\ \begin{matrix} A \\ B \end{matrix} & \begin{bmatrix} 0.9 & 0.1 \\ 0.5 & 0.5 \end{bmatrix} \end{matrix}$$

Determine their probabilities in the steady state. (8)

- b) Show that the following Markov chain is ergodic & regular.

$$\begin{matrix} & \begin{matrix} \text{To} \\ A & B & C \end{matrix} \\ \begin{matrix} \text{From} \\ A \\ B \\ C \end{matrix} & \begin{bmatrix} 1/4 & 1/4 & 1/2 \\ 1/4 & 3/4 & 0 \\ 1/2 & 0 & 1/2 \end{bmatrix} \end{matrix} \quad (8)$$