10.a) Define:
i) Transient state ii) recurrent state.

b) Find the equilibrium vector of $\begin{bmatrix} 0.5 & 0.5 \\ 0.2 & 0.8 \end{bmatrix}$ [10]

OR

11. If the transition probability matrix is given by $\begin{bmatrix} 0.1 & 0.4 & 0.5 \\ 0.2 & 0.2 & 0.6 \\ 0.7 & 0.2 & 0.1 \end{bmatrix}$ and $P_0 = [0.4, 0.4, 0.2]$

Find:
a) The distribution after three transitions.
b) Limiting probabilities. [10]

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