650 Homework Assignment 2

1. Consider Markov Chain with transition matrix below:

$$P = \begin{bmatrix} 0 & .6 & 0 & .4 & 0 \\ .5 & 0 & .5 & 0 & 0 \\ .2 & .2 & .2 & .2 & .2 \\ 0 & 0 & 0 & .3 & .7 \\ 0 & 0 & 0 & .3 & .7 \end{bmatrix}$$

(a) Is this MC irreducible? How many class does this MC have?

(b) Is there any transient states? If so, which one(s)? Explain why that state(s) is transient.

(c) If this MC was run for long time, what are the proportions of times in each state?

(d) What is the average time from state i to state i? (i=1,2,3,4,5)

(e) Obtain average time from state i to state 4. (i=1,2,3,5)