Markov Chain

Question 1:

Given the Markov chain model:



(a) Complete the missing probabilities in the above chain.

(b) For each state 1-6, identify whether it is recurrent or transient.

(c) If the state is 1 at Monday, what is the probability that it will be state 5 at Thursday the same week?

(d) If the state is 4 today, will the chain be converge to steady state? If so, give the probability. If not, give the reason.

(e) If the state is 1 today, give the probability that state 6 will never arrive in the future? Solutions:

Question 2:

Consider X_1, X_2, \ldots, X_{20} independent random variables, which are uniformly distributed over the interval [0, 1]. Estimate $P(X_1 + \cdots + X_{20} \ge 7)$ using Markov inequality, Chebyshev inequality and CLM respectively.