**MIDSEM TEST**

Missing Values

|  |  |  |  |
| --- | --- | --- | --- |
| X | A | B | C |
| 5.1 | 6 | 1.8 | 2.2 |

Question 1

1. The inter-event time follows a Poisson Distribution

Question 2

1. For the chain to be an absorbing Markov process, every state must be able to reach a state that is absorbing. So both have to be 1 since we could start at either state 1 or state 2, and since both states are absorbing the chain will be considered an absorbing Markov process. Another option would be to direct to only one state, i.e. a->b only or b-> a only. So (a = 0, b = 1) or (a = 1, b = 0) respectively.
2. For a continuous-time Markov chain to be an absorbing Markov process the generator matrix, , the rows should equal to 0 and However the
3. Given enough cycles, the distribution matrix for the Markov chain will eventually become a stationary distribution

Question 3

1. P =   
   [0, 0.5, 0.5,  
   0.5, 0, 0.5,  
   0.5, 0.5, 0]
2. Pr(period = 2) = 1/4  
   a -> b -> a  
   a -> c -> a  
   b -> a -> b  
   b -> c -> b  
   c -> a -> c  
   c -> b -> c
3. D = [  
   0.5  
   0.5  
   0.5]  
   Final distribution = D\*P = [0.5, 0.5, 0.5]  
   The final distribution does not change regardless of where the starting state is, since every final position is equally likely.

Question 4

Missing Values

|  |  |  |
| --- | --- | --- |
| 0.076404 | 0.195743 | 0.371898 |
| X | Y | Z |

\_tq\_x = (1 -\_tp\_x) =

Mu\_x = Bc^x

Equations:

Mu\_60 = Bc^60 =

Mu\_65 = Bc^65 =

Mu\_70 = Bc^70 =

Question 5