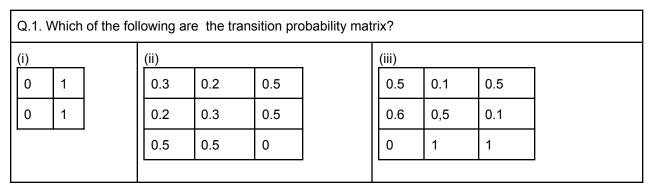
Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science and Commerce(Autonomous)

Programme: MSc. (Statistics) Part-1 Semester-2

Practical based on Stochastic Process Markov Chain -2



Q.2. Consider markov chain with state space {0,1,2} and its t.p.m is given below			•	Draw transition probability diagram and answer the following
0.5	0	0.5		(i) Is chain reducible? (ii) find transient and recurrent states.
0	1	0		
0.5	0	0.5		
<u>, </u>	•	•	•	

- 1	Q.3. Consider a markov chain with state space {0,1,2,3} and t.p.m is given below					(i) Is the chain irreducible? (ii) Are all states transient? (iii) are all states recurrent?
	0.5	0.5	0	0		
	0.5	0.5	0	0		
	0	0	0	1		
	0	0	1	0		

Q.4. Consider a M.C. with state space {0,1,2,3,4} and t.p.m. given below

1	0	0	0	0
0.25	0.75	0	0	0
0	0.5	0.5	0	0
0.25	0.25	0	0.25	0.25
0	0	0	0.5	0.5

Classify all the states as recurrent or transient. Is this M.C. irreducible?

Q.5.Consider the following T.P.M

0.5	0.5	0	0	0
0	0.5	0.5	0	0
0.5	0	0.5	0	0
0	0	0	1	0
0.2	0.2	0.2	0.2	0.2

Classify all the states. Is this M.C reducible?

Q.6. Consider M.C. given below

0.5	0.5	
0.25	0.75	

0.5 0.5 0.25 0.75 Find $P(X_3 = 1/X_0 = 0)$ and $P(X_4 = 1/X_0 = 1)$.

Q.7. Consider following markov chain with t.p.m.given below

1	2	3	4
0	1/2	1/2	0
1/3	0	0	2/3
1	0	0	0
0	0	0	1

Show the state transition diagram for above Markov Chain and Classify the states into

- (i) Communicating Classes
- (ii) Reducible or irreducible states
- (iii) absorbing state and closed states

Also find the mean recurrent time for recurrent states

Q.8. Consider following markov chain with t.p.m.given below

0	1	2	3
1/8	1/4	1/8	1/2
3/4	0	0	1/4
0	3/4	0	1/4
1/8	0	7/8	0

Find Stationary distribution of M.C.

Q.9. Consider a Markov chain with tpm given

0	1 2	
0.5	0	0.5
0	1	0
0.5	0	0.5

Check periodicity of Chain. Also find stationary distribution of the MC.