Question 1

i> Stochastic process is a collection of random variable 'Xt' for each time t in a time set J [t ∈ J]
It is a time dependant phenomenon

ii> This is because after sometime the distribution may stabilize which is called long term stationarity distribution chain.

iii>

Question 2

probability of ~~being dry~~ rain = p.
probability of ~~getting wet~~ no rain = (1-p)

$1 + \cancel{p^2} - 2p + p - \cancel{p^2}$

$$\begin{array}{c|c} & \begin{matrix} \quad 1 \quad & \quad 2 \quad & \quad 3 \quad & \quad 4 \quad \end{matrix} \\ \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \end{matrix} & \begin{bmatrix} (1-p)(1-p) & (1-p)(p) & 0 & 0 \\ p(1-p) & (1-p(1-p) & (1-p)(p) & 0 \\ 0 & (p)(1-p) & (1-p(1-p) & (1-p)(p) \\ 0 & 0 & p(1-p) & (1-p)(1-p) \end{bmatrix} \end{array}$$

$\cancel{1-p^2+p-p^2}$

$(1-p)(1-p) + p(1-p) + 0 + 0 = 1$

$1 + \cancel{p^2} - 2p + p - \cancel{p^2} = 1$

$-p = 0$

$p = 0$

Q3) Counting process

General random walk	discrete SS	discrete TD
Poisson process	discrete SS	discrete TD
Markov chain	discrete SS	discrete TD
Markov Jump	discrete SS	continuous TD

a)
b) Markov Chain.
c) Poisson process.
d) Markov jump.

Q4> i> ~~This~~ ~~This~~ Because player in tier B can move to tier D in one time step This is not a Markov property

C - performance decreased from A as compared to 2017 and 2016

D - performance decreased from B as compared to 2017 and 2016.

Q5> i> Since present data is not independent of past data, Markov property does not hold.

ii> Since it is dependand on past values.

iii>

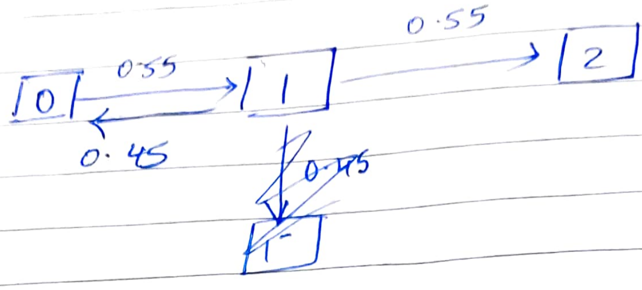
$$\begin{array}{c|cc} & 0 & 1 \\ \hline 0 & pe^{-\lambda(y_1 \cdots y_n)} & 1-pe^{-\lambda(y_1 \cdots y_n)} \\ 1 & & \end{array}$$

iv> Not time homogenous.
Irreducible.

Q6> b>

Q7)

Q8)



	0	1	2
0	0	0.·	
1			
2			

89)