



QP CODE: 26801756	 26801756	Reg No	:	
		Name	:	

INTEGRATED M.Sc. DEGREE EXAMINATION, APRIL 2026

Eight Semester

INTEGRATED M.Sc. BASIC SCIENCES-STATISTICS

CORE - IST8CR02 - STOCHASTIC PROCESSES

2020 Admission Onwards

D17ACAFA

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. What is meant by a regular markov chain?
2. What do you meant by mean recurrent time?
3. State Mean ergodic theorem.
4. What is limiting probability in markov chain?
5. Define Yule-Furry process.
6. What is meant a birth-death process?
7. What is kolmogrov forward differential equation?
8. State the renewal theorem.
9. What are the 4 time series models?
10. Define ARMA Process.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Obtain the stationary distribution of the markov chain with Transition probability matrix $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$





12.	Derive the formula for variance function of the branching process.
13.	If state j is transient and i is any other state . Then $\lim_{n \rightarrow \infty} P_{ij}^{(n)} = 0$
14.	State and prove Chapman-Kolmogorov equation for continuous time markov chain.
15.	Derive the waiting time distribution of nth events associated with a poisson process.
16.	Briefly explain renewal process.
17.	What is Correlogram and how to interpret it?
18.	Briefly explain MA(1) process.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19.	Derive the p.g.f for total progeny of a branching process.
20.	Explain Poisson process.
21.	Explain how the poisson process viewed as a renewal process?
22.	Explain Box-Jenkins model.

(2×5=10 weightage)

