B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
III Year VI Semester
Core Major - Paper XVI
STOCHASTIC PROCESSES

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Define stochastic process.
2. Define Markov process.
3. Give an example of strict sense stationary process.
4. What is meant by transition probability matrix?
5. When a state is said to be recurrent.
6. Define second order stationary process.
7. Mention some application of birth and death process.
8. Define Yule Furry process
9. Define a Poisson process.
10. State any two property of negative binomial distribution.
11. Explain a steady state and a transient state.
12. What are a periodic chain?

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Define the process with independent increment.
14. Show that "maximum number' after n tosses of die is a Markov chain.
15. Define an Ergodic chain.
16. State the postulates of Poisson process.
17. State and establish Chapman Kolmogrov's equation.
18. Show that sum of two independent Poisson process is also a passion process.
19. Describe the way how the queuing system are classified according to its characteristics.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Describe the general classification of Stochastic Process with an example.
21. The number of accidents in a city follows a Poisson process with a mean of 2 per day and the number of people involved in the ith accident has the distribution (independent) $p\{X_i = k\} = \frac{1}{2^k}(k \geq 1)$ find the mean and variance of the number of people involved in accidents per week.
22. Show that a Markov chain uniquely determined by its transition probability matrix and initial distribution.
23. Define birth and death process and obtain differential equations of the same.
24. Obtain the steady state solution to single server poisson queue model with infinite capacity.

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