D **91627** (Pages : 2) Name.......................................

Reg. No..................................

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2015

(CUCSS)

Statistics

STA 3C 11—STOCHASTIC PROCESSES

(2010 Admission onwards)

Time : Three Hours   Maximum : 36 Weightage

Part A

Answer all questions.
Each question carries 1 weightage.

1. Give an example of a stochastic process.

2. Write down the different classes of a stochastic process.

3. What is lack of memory in the disore case ?

4. How can you write the one step transition probabilities ?

5. When will you say that a process is stationary ?

6. What is equilance class ?

7. Define periodicity.

8. How will you find out the higher order transition probabilities ?

9. Can a process remain in a transient class for ever ?

10. Define stationary distribution.

11. What is offspring distribution ?

12. Write down the central limit theorem for renewals.

(12 × 1 = 12 weightage)

Part B

Answer any eight questions.
Each question carries 2 weightage.

13. What is a random walk ?

14. Give an example of a recurrence chain.

15. Show that inter-occurrence time in a Poisson process is exponential.

16. What is a birth-death process ?

17. Describe a queueing model.

Turn over

18. What is Little's formula ?

19. Describe a renewal reward process.

20. What is Malthusian parameter ?

21. What is Brownian motion ?

22. Explain briefly a G/M/1 queue.

23. Describe a continuous time branching process.

24. Comment on inference on Markov chain.

$(8 \times 2 = 16 \text{ weightage})$

Part C

Answer any two questions.
Each question carries 4 weightage.

25. Find the mean and variance of a G.W. branching process.

26. State and prove elementary renewal theorem.

27. Establish a sufficient condition for a Markov chain to be transient.

28. Find the steady-state probability for an M/M/1 queue.

$(2 \times 4 = 8 \text{ weightage})$