Unit I

2. Discuss the components of a queueing system and their roles. **15**

3. Explain the concept of Markov chains and their application in analyzing queueing systems.. **15**

Unit II

4. Derive the steady state and time-dependent solutions of the M/M/1 queueing system. **15**

5. Explain Little's formula and its significance in queueing theory. **15**

Unit III

6. Discuss the M/M/1 queueing system with phase-type service and its measures of effectiveness. **15**

7. Explain the Erlang service model M/Ek/1 and its application in queueing theory. **15**

Unit IV

8. Discuss the departure point steady state system size probabilities for the M/G/1 queueing system. **15**

9. Explain the Pollaczek-Khintchine formula and its relevance to queueing theory. **15**

Roll No. ..... **Total Pages : 02**

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THEORY OF QUEUES

ST-403&ST-404

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory.

Compulsory Question

1. (a) Define a queueing system.

(b) Explain the concept of a Poisson process and its relevance to queueing theory.

(c) What does the notation M/M/1 signify in queueing theory ?

(d) Describe the busy period in a queueing system.

(e) How does a multiple channel queueing system with constant service time (M/D/C) operate ?

(f) What are the arrival point steady state system size probabilities for a GI/M/1 queueing system ?

(g) What is the machine interference model in queueing theory ? **2+2+2+2+3+2+2**