

Roll No.

CS-703

B. E. (Seventh Semester) EXAMINATION, June, 2009

(Computer Science & Engg. Branch)

SIMULATION AND MODELLING

(CS-703)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Draw the flowchart to describe the complete process of simulation.
(b) Describe in brief four guiding principles used in simulation modelling.
2. (a) Describe the mixed congruence algorithm for uniform random number generation.
(b) Discuss the inverse transformation method for generating non-uniform continuous random number using the function :

$$f(x) = \frac{1}{x + A} , 0 \leq x \leq 1$$
$$= 0 , \text{ elsewhere}$$

3. (a) Give the two situations where rejection method is feasible and why ?

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- (b) Name three principal entities, attributes and activities to be considered to simulate the operation of a telephone exchange.
4. (a) A bus arrives every 20 minutes at a specified stop beginning at 6:40 a.m. and continuing until 8:40 a.m. a certain passenger does not know the schedule, but arrives randomly (uniformly distributed) between 7:00 a.m. and 7:30 a.m. every morning. What is the probability that the passenger waits more than 5 minutes for a bus ?
- (b) Describe the characteristics of queuing system.
5. Derive Poisson formula for queuing system M/M/1 model.
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6. (a) Develop a model and write a program in dynamo/stella for inventory control.
- (b) Develop casual loop diagram and flow diagram for disk scheduling problem.
7. (a) Explain the steps required in validation a SD model.
- (b) What are the factors involved for design and validate simulation experiment ?
8. Write short notes on any *three* of the following :
- (a) Chi-square test
- (b) SIMSCRIPT
- (c) Types of Models
- (d) Use of queuing theory in computer network
- (e) Bayes theorem in probability
- (f) Coherence in causal loop