SOB: COMPUTER
BE (IT), SEM: VIII, CBGS

Dt. 30/5/2016

Computer Simulation & Modeling

QP Code :729100

(3 Hours) **[Total Marks: 80]**

N.B. :
1. Question No. 1 is **compulsory**.
2. Out of remaining 5 questions, attempt any **three** questions.
3. Assume **suitable** data wherever required but **justify** the same.
4. **All** questions carry **equal** marks.
5. Answer to each new question to be started on a fresh page.
6. **Figure** to the **right** in brackets indicate **full** marks.
7. Use of statistical table is allowed.

1. (a) Briefly explain the steps in simulation study. (5)

   (b) Compare random numbers and random variate:- (5)

   (c) Explain data collection and analysis in input modeling :- (5)

   (d) State queue notation, queue discipline and queue behavior:- (5)

2. (a) Discuss various costs that are involved in inventory system. Explain the policy and goal of inventory system:- (10)

   (b) Consider the following sequence of 5 numbers

   0.15, 0.94, 0.05, 0.51, 0.29

   Use the kolmogorov – Smirnov test to determine whether the Hypothesis of uniformity can be rejected. Given α=0.05 and the critical value of D=0.565 (10)

3. (a) What is time-series input model? Explain AR(1) and EAR(1) model:- (10)

   (b) Records pertaining to the monthly number of job-related injuries at an Underground coal mine were being studied by federal agency. The values for the past 100 months were as follows:-

Injuries per month	0	1	2	3	4	5	6
Frequency of occurrence	35	40	13	6	4	1	1

   Apply the chi-square test to these data to test the hypothesis that the underlying distribution is Poisson. Use the level of significance α=0.05 (10)

4. (a) A tool crib has exponential inter-arrival and service times and serves a very large group of mechanics . The mean time between arrivals is 4 minutes. It takes 3 minutes on the average for a tool-crib attendant to service a mechanic. The attendant is paid $10 per hour and the mechanic is paid $15 per hour. Would it be advisable to have a second tool-crib attendant? (10)

(b) What do you understand by model verification and validation? How would you Validate input-output transformation of a model? (10)

5. (a) Give the equation for steady state parameters of M/G/1 queue and derive M/M/1 From M/G/1:- (10)

(b) Explain Inverse-Transform technique:- (10)

6. (a) Explain Manufacturing and Material handling system:- (10)

(b) Explain Reliability System in detail:- (10)

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