**[Time: Three Hours]**                                           **[Marks:75]**

Please check whether you have got the right question paper.

N.B:
1. All questions are compulsory.
2. Answers to the two sections must be written in same answer book and should be submitted together.
3. Write answers to same questions together.
4. Mixing of sub-questions is not allowed.

## SECTION - I

**Q.1** A) When is simulation an appropriate tool?      **06**

B) Explain discrete random variable with example.      **07**

**OR**

**Q.1** A) What are the various steps in simulation study?      **06**

B) The probability of computer chip failure is 0.05. Everyday a random sample of size 14 is taken. what is the probability of      **07**

     i. At most 3 will fail.

     ii. at least 3 will fail

**Q.2** A) Describe the event scheduling simulation.      **06**

B) 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 bus arrives randomly 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?      **07**

**OR**

A) Explain data collection for input modeling.      **06**

B) A medical examination is given in 3 stages by a physician in each stage is exponentially distributed which mean service time 20 mins. Find the probability that the exam will take 50 mins. Or less. Also determine the expected length of the exam.      **07**

**Q.3** A) What do you understand by model verification and validation?      **06**

B) Consider the sequence of 40 numbers:      **06**

| 0.09 | 0.42 | 0.23 | 0.68 | 0.89 | 0.72 | 0.12 | 0.45 | 0.08 | 0.32 |
|------|------|------|------|------|------|------|------|------|------|
| 0.53 | 0.13 | 0.65 | 0.97 | 0.14 | 0.49 | 0.55 | 0.46 | 0.77 | 0.28 |
| 0.81 | 0.63 | 0.40 | 0.57 | 0.02 | 0.16 | 0.33 | 0.86 | 0.99 | 0.22 |
| 0.76 | 0.48 | 0.61 | 0.39 | 0.43 | 0.78 | 0.20 | 0.35 | 0.17 | 0.93 |

Determine whether there are an excessive number of runs above or below the mean. Use $\alpha$=0.5 and mean =0.495.

**OR**

A) Write short notes on following      **06**

     (a) Inverse transform technique.

     (b) Poisson process properties.

**P.T.O**

B) Consider the following given numbers of data and use chi-square test with $\alpha$=0.05 to test the hypothesis that the no. are uniformly distributed [0, 1].   **06**

| Upper Limit | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
|---|---|---|---|---|---|---|---|---|---|---|
| Oi | 10 | 9 | 5 | 6 | 16 | 13 | 10 | 7 | 10 | 14 |

## SECTION – II

**Q.4** A) Why there is need to distribute centralize object? Explain the advantage of distributed system.   **06**

B) Why COM is better than C++? Justify your answer.   **07**

**OR**

**Q.4** A) Write a short note on (a) DCOM (b) QueryInterface.   **06**

B) Explain Multitier system architecture.   **07**

**Q.5** A) "It is better if we separate interface and COM implementation", explain why?   **06**

B) What is role of IDL? Why it is very important?   **06**

**OR**

**Q.5** A) Explain the term with respect to Apartment-Life Cycle Management.   **06**

B) What is CORBA? What is the use of Stub and Skeleton? Explain.   **06**

**Q.6** A) Explain any five CORBA services.   **06**

B) Write a short note on JNI.   **06**

**OR**

**Q.6** A) What do you mean by Object Web? Explain with example.   **06**

B) Write short note on EJB.   **06**

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