

QP Code : 29926**(3 Hours)****[Total Marks :100**

- N.B.:** (1) Question No.1 is Compulsory.
 (2) Attempt four questions out of remaining.
 (3) Figures to right indicate full marks.

1. a) State when simulation is appropriate. 5
 b) What are the characteristics of queuing system? 5
 c) Define system state, event notice, activity, delay and clock. 10
2. a) Explain Inverse transform technique to generate random variate. 10
 b) What is world view? Discuss different types of world views. 10
3. a) The sequence of numbers {0.12,0.01 ,0.23,0.28,0.89,0.31,0.64,0.28,0.33,0.93} has been generated. Test the random numbers for independence by runs up and down test. Take $\alpha = 0.05$ and critical value $z_{0.025} = 1.96$ 10
 b) Explain Poisson Process along with its properties. 10
4. a) State the properties of random numbers. What are the methods used to generate random numbers? 10
 b) What is Time Series input model .Explain AR(1) and EAR(1) model. 10
5. a) What do you understand by "Goodness of Fit Test"? Write the procedure for the same. 10
 b) Derive steady state parameters for M/G/1 and M/M/1 queue. 10
6. a) A Medical examination is given in three stages by physician. Each stage is exponentially distributed with a mean service time of 20 minutes. Find the probability that exam will take 50 minutes or less. Also determine the expected length of the exam. 10
 b) What is the purpose of model verification? What are the different ways available to verify a model. 10
7. Write short notes on **any Two** of the following. 20
 (a) Acceptance-rejection Technique
 (b) Cobweb Model
 (c) Issues in Manufacturing System and Material handling system