

**M. TECH.-I (MECHANICAL CAD/CAM) (CBCS – 2015 COURSE) :
WINTER - 2017**

SUBJECT: MODELING AND SIMULATION

Day: Wednesday
Date: 17/01/2018

W-2017-2789

Time: 11.00 AM TO 02.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if **WHENEVER** necessary.

Q.1 Explain different types of models used for analysis of various types of systems. (10)

OR

Q.1 Write the different phase of a simulation study and discuss in brief. (10)

Q.2 Employ the arithmetic congruential generator, to generate a sequence of 10 random numbers given $r_1 = 987$, $r_2 = 535$ and modulo $m = 1000$. (10)

OR

Q.2 Discuss Monte Carlo simulation with the help of suitable example. (10)

Q.3 Generate three random variates from a normal distribution with mean 20 and standard deviation 5. Take $n = 12$ for each observation. (10)

OR

Q.3 If x is a random variable with the following distribution, $f(x) = xe^{-x}, x \geq 0$, show graphically its probability density function $f(x)$ and the cumulative distribution function $F(x)$. (10)

Q.4 Write a algorithm for simulation of water reservoir system. (10)

OR

Q.4 Write a matlab code for trajectory simulation. (10)

Q.5 The distribution of inter-arrival times in a single server model is. (10)

t: 1 2 3
f(t): 0.25 0.50 0.25

and distribution of service times is

s: 1 2 3
f(s): 0.50 0.25 0.25

Complete the following table using the two-digit random numbers 11, 20, 47, 68, 90, 62 and 35 to generate arrivals and 15, 86, 20, 42, 11, 36 and 48 to generate the corresponding service times.

Arrival No.	Arrival time	Service begin time	Service end time	Waiting time in queue	Server idle time

OR

Q.5 Why simulation of inventory system to be done? Elaborate with some of the factors. (10)

Q.6 Explain calibration and validation of simulation models. (10)

OR

Q.6 Write a short notes on 'SLAM II' and 'SIMAN'. (10)

* * * * *