Name: Enrolment No:	ⵣUPES UNIVERSITY OF TOMORROW

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Modelling and Simulation   **Semester: IV**
Program: B.Tech. (Hons) CSE-BAO, CCVT, CSF, GG, DevOps, Big data, AI-ML   **Time: 03 hrs.**
Course Code:CSEG2037P   **Max. Marks: 100**

Instructions: Attempt all the questions.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Discuss the application areas of modelling and simulations.	4	CO1
Q 2	Differentiate between deterministic and stochastic systems.	4	CO2
Q 3	Discuss the performance parameters of a Queueing System.	4	CO3
Q 4	In Queuing system, discuss the following term: a) Infinite Population Model b) Finite Population Model	4	CO4
Q 5	Differentiate between validation and verification process.	4	CO1

SECTION B
(4Qx10M= 40 Marks)

Q 6	40% of the assembled ink-jet printers are rejected at the inspection station. Find the probability that the first acceptable ink-jet printer is the third one inspected. Also find the probability that third printer inspected is the second acceptable printer.	10	CO2
Q 7	Generate a sequence of random numbers and identify maximum period for a=13, m=26 & x=1, 3, and 4. Or Generate twenty random numbers using multiplicative congruential method with x=5, a=11, and m=64. Provide your observation for the generated random numbers.	10	CO3
Q 8	Cluster the following eight points (with (x, y) representing locations) into three clusters using k-means algorithm: A1(2, 10), A2(2, 5), A3(8, 4), A4(5, 8), A5(7, 5), A6(6, 4), A7(1, 2), A8(4, 9)	10	CO4
Q 9	Draw and explain the mesh network architecture. Discuss the following for the mesh network: a) Types of Mesh Network.	10	CO2

	b) Advantages and Disadvantages of Mesh Network		
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	Discuss the concept of Actor based simulation with suitable example. Or Discuss the Monte carlo simulation technique with suitable example.	**20**	**CO2, CO3**
Q 11	Discuss the various ways to analyse the simulated results. How the available tools are helpful in analysis of results. Discuss the available tools, which are helpful in result analysis.	**20**	**CO4**