

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-IV Semester (CSE/IT)

COURSE CODE (CREDITS):18B11CI413

MAX. MARKS: 15

COURSE NAME: Modeling and Simulation Techniques

COURSE INSTRUCTOR: Dr. Emjee Puthooran

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculators is allowed

Q.No	Question	CO	Marks
Q1	Differentiate between continuous and discrete simulation methods, giving one example for each.	CO-1	2
Q2	Explain the concepts of system complexity and how it influences the choice of simulation over analytical methods.	CO-1	2
Q3	Define simulation and explain its advantages in studying complex systems. Provide an example of a system where variability plays a key role.	CO-1	3
Q4	What is modeling? Describe its key characteristics and categories, with a focus on conceptual versus mathematical models.	CO-2	3
Q5	(a) In the context of simulation output analysis, a simulation model was run 10 times, yielding the following output values for processing time (in minutes): 12.5, 13.2, 11.8, 12.9, 13.0, 12.1, 12.7, 13.4, 11.9, 12.6. Calculate the sample mean and sample standard deviation. Then, compute a 95% confidence interval for the true mean processing time. (Assume t-critical value for 9 degrees of freedom is approximately 2.262.) (3 Marks) (b) Explain Type I and Type II errors in hypothesis testing for statistical significance. Briefly describe how correlation is used in input data modeling. (2 Marks)	CO-2	5