JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

M.Tech-II Semester (CSE)

COURSE CODE (CREDITS): 18M1WCI116

MAX. MARKS: 35

COURSE NAME: Security Design and Architecture

COURSE INSTRUCTORS: Mr. Saurav Singh

MAX.TIME: 2 Hour

Note: (a) All questions are compulsory.

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

Q.No	Question	CO	Marks
Q1	Explain the State Machine Security Model. How does it ensure system security? Create State transition diagram for User authentication system.	CO9	3+2
Q2	Explain the Zachman Framework for Enterprise Architecture in detail. Discuss all the components of its matrix(including rows and columns), and how it helps in aligning business goals with IT systems.	CO9	7
Q3	Explain the Lattice-Based Access Control Model. Use a diagram to show how users and objects are arranged in a security lattice. Which of the operations are allowed in the given table if we follow the Lattice Based Access Control Model.	CO9	4+4

Operation	Subject A (Secret)	Subject B (Top Secret)
Read File X (Confidential)		
Write File X (Confidential)		
Read File Y (Top Secret)		
Write File Y (Top Secret)		

Q4	Describe the Trusted Computer System Evaluation Criteria (TCSEC). Explain its classification levels and the security features evaluated at each level. How does TCSEC contribute to the development of secure systems?	CO8	5
Q5	Describe TOCTOU (Time-of-Check to Time-of-Use) race conditions. How do such vulnerabilities arise in concurrent systems, and what techniques can mitigate them?	CO7	5
Q6	What are the practical challenges in implementing the CIA triad in large-scale systems? Briefly describe some ideas to overcome those challenges.	CO6	5