JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

B.Tech-V Semester (IT)

COURSE CODE (CREDITS): 18B11CI512(3)          MAX. MARKS: 35

COURSE NAME: INFORMATION SYSTEMS

COURSE INSTRUCTORS:  DR. RUCHI VERMA          MAX. TIME: 2 Hours

*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 | Design a hybrid information architecture that combines:<br>i. multi-tier components<br>ii. microservices for payments<br>iii. SOAP-based external financial services<br>iv. REST APIs for sellers<br>v. LBS for mobile users | CO1 | 5 |
| Q2 | A multinational bank currently uses a two-tier architecture for its internal loan approval system and plans to shift to a three-tier micro services based architecture accessible to employees via web and mobile.<br>Explain with justification, how this transition will affect scalability, business rule isolation, data latency and security exposure across network boundaries. | CO2 | 5 |
| Q3 | Design an algorithmic workflow for a dynamic price-surge engine for a cab delivery system using demand forecasting, TPS load, real time cancellations and user acceptance probability | CO4 | 5 |
| Q4 | Compare Two-Phase Commit and Saga Pattern in distributed e - commerce checkout flows. For each approach, give:<br>i. one major advantage<br>ii. one critical limitation<br>iii. one realistic business use case | CO2 | 5 |
| Q5 | An attacker uses phishing to install a trojan keylogger, steals login credentials, and then performs an SQL injection attack on a company's online payroll portal.<br>Construct a layered defense mechanism that would have prevented all stages of the attack, mapping each control to the exact phase of the kill-chain. | CO3 | 5 |
| Q6 | Design a secure cross-border mobile shopping platform that uses<br>i. LBS for regional discounts | CO2 | 5 |

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| | ii. SOAP Web Services for payments<br>iii. API-based seller on boarding<br>iv. Real-time TPS for inventory updates<br><br>(a) Identify which parts of the system require 1-tier, 2-tier, and 3-tier architectures and why<br>(b) Explain how transaction context propagates across the SOAP services<br>(c) Include a cyber-security threat model with specific control mechanisms | | | |
| Q7 | Write the full code of a Stateless Session Bean that returns a list of strings representing today's tasks for a user.<br><ul><li>Remote Interface</li><li>Bean Implementation</li><li>A sample client lookup code snippet</li></ul> | CO4 | 5 | |