

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-VI Semester (CSE/IT)

COURSE CODE (CREDITS): 19B1WCI635 (02)

MAX. MARKS: 25

COURSE NAME: Architecting Distributed Cloud Applications

COURSE INSTRUCTORS: Dr. Nishant*, Dr. Arvind

MAX. TIME: 1 Hour 30 Min

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	a) Define service endpoints. Explain how service endpoint scalability impacts performance in distributed cloud applications. b) Differentiate between forward proxy and reverse proxy with suitable diagrams.	2	[3+2]
Q2	a) What is a reverse proxy load balancer? Describe how it improves availability in cloud environments. b) Assume you have 3 backend services behind a reverse proxy. Each has 95% availability. Calculate the probability that at least one service is available at any time. (Show steps clearly)	2	[2+3]
Q3	a) Why Services Must Be Idempotent? How to Implement Idempotency in Services? b) Explain what service APIs are and how they are used in distributed cloud applications.	2	[3+2]
Q4	a) Discuss with a suitable example, the concept of fault tolerant message processing in distributed cloud environment. b) A cloud-based messaging system processes 5,000 messages with an average delay of 120ms per message. If there are 10 parallel VMs, calculate the approximate total processing time.	3	[3+2]
Q5	Consider the Following scenario: Suppose you are designing a cloud-based ride-hailing service . a) Explain how you would use messaging queues between microservices like driver location, ride assignment, and payment processing to ensure fault tolerance. b) What potential challenges could arise with message duplication and out-of-order delivery? How would you mitigate them?	3	[3+2]