

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

B.Tech-VI Semester (CSE/IT)

COURSE CODE (CREDITS):19B1WCI635 (2)

MAX. MARKS: 35

COURSE NAME: Architecting Distributed Cloud Applications

COURSE INSTRUCTORS: Dr. Nishant*, Dr. Arvind.

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	a) A microservice-based application is being upgraded using rolling updates. List the steps involved and analyze the impact of a partial failure during the upgrade process. b) Why are rolling updates preferred in high-availability systems?	4	5+2
Q2	A storage service handles three data types: - Hot data: 1 TB - Warm data: 3 TB - Cold data: 6 TB If storage costs are as follows: Hot: \$0.02/GB, Warm: \$0.01/GB, Cold: \$0.004/GB Calculate the total monthly storage cost. Recommend a strategy to optimize costs without compromising availability.	4	5
Q3	a) A leader election mechanism using leases has the following parameters: - Lease duration: 10 seconds - Heartbeat interval: 3 seconds If the leader node crashes after 7 seconds, estimate the time delay before a new leader is elected. Discuss how this impacts the availability of the system. b) Explain with an example how disaster recovery mechanisms can minimize data loss in object storage.	4	4+2
Q4	a) Describe how point-in-time recovery works in cloud-managed database services like Amazon RDS or Azure SQL. b) During a Rolling Update, a company updates 5% of their 100 instances at a time. Each batch update takes 15 minutes. How long will it take to complete the entire rolling update?	4	3+3
Q5	Define the following: i. Rolling updates ii. Graceful shutdown of a service	4	5

	iii. Service configuration iv. Data temperature v. Object storage		
Q6	<p>a) A microservice application is deployed using a rolling update strategy. During an update, 2 out of 5 instances crash.</p> <ol style="list-style-type: none"> 1. Analyze the system behavior. 2. Suggest two ways to ensure safer deployments. <p>b) A company is planning to deploy a Blue-Green deployment strategy for their application updates. They have two environments: Blue (current production) and Green (staging). If the deployment to the Green environment takes 30 minutes and the switch from Blue to Green takes 10 minutes, how much total downtime will the users experience during the deployment?</p>	4	3+3