



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGE Act, 1956)

REG.NO.:

SCHOOL OF COMPUTER SCIENCE ENGINEERING & INFORMATION SYSTEMS

CONTINUOUS ASSESSMENT TEST - II

FALL SEMESTER 2025-2026

SLOT: A2 + TA2

Programme Name & Branch : B. Tech & IT
Course Code and Course Name : BCSE355L Cloud Architecture Design
Faculty Name(s) : Dr. Jagadeesan S, Dr Jaganathan J & Dr.G. Mohanraj
Class Number(s) : VL2025260105137, 133,136
Date of Examination : 05/10/2025 & FN
Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s): Answer All Questions

- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- CO2-Apply security and compliance measures effectively in AWS architectures using encryption, access controls, and monitoring.
- CO3- Optimize cost and performance by selecting appropriate AWS services and utilizing cost-effective resource management strategies.
- CO4-Configure and manage advanced AWS networking features; storage solutions, database technologies, and compute resources.

Q. No	Question	M	CO	BL
1.	A healthcare technology company is developing a real-time patient monitoring system for hospitals that continuously collects biometric data such as heart rate, oxygen levels, and blood pressure from thousands of wearable devices. This data must be ingested, stored, and analyzed instantly to detect anomalies and trigger timely alerts for medical staff. The current relational database struggles to meet the high-volume, high-velocity, and low-latency requirements, especially during peak hours. Considering this scenario, design a suitable Amazon database service model for storing and querying patient vitals, and justify your choice of database service by explaining how it meets the system's performance, scalability, and low-latency needs.	10	4	3
2.	Nirmaan is a tech-driven B2B e-commerce platform that supplies building materials such as sanitaryware, tiles, and electricals to retailers across India. The company aims to streamline procurement and logistics while offering competitive pricing and fast delivery. As Nirmaan scales its operations, it faces challenges in managing its growing database workload, ensuring high availability, and maintaining data security. As a cloud architect, you're tasked with designing a relational database layer that meets the following operational goals for Nirmaan. For each goal, identify the specific capabilities of a managed database service that would fulfill the requirement, and explain how they contribute to scalability, availability, and security.	10	4	4



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3.	Considering you are the cloud engineer for a fintech company operating a real-time trading platform on AWS, the platform uses a microservices architecture deployed on Amazon EC2 instances, handling high-frequency trade execution, market data processing, and providing real-time analytics to traders. Recently, the platform has faced security and reliability challenges. Certain microservices have occasionally been exposed to unauthorized access, and data inconsistencies have been observed between services, compromising the integrity of trades and analytics. Implement AWS monitoring and security services to track system health, detect anomalies or unauthorized access, and trigger automated alerts to address issues before they impact traders or regulatory compliance.	10	2	3
4.	A university research lab has recently migrated its data analysis and simulation workloads to AWS to support multiple research teams. Initially, they relied on the AWS Free Tier and promotional credits, but after four months, the finance office notices unexpected charges on the monthly AWS bill. The lab director wants better visibility into cloud usage, tighter cost control, and optimization of resources across various research projects. As the cloud architect, you're tasked with designing a solution using AWS Billing and Account Management, AWS Budgets, AWS Cost Management tools, and AWS Trusted Advisor to prevent overspending, enforce budget alerts, track free tier usage, and provide cost-optimization recommendations.	10	3	4
5.	A global online learning platform hosts interactive courses and live virtual classrooms on AWS, serving thousands of students and instructors worldwide. The platform stores student records, payment details, and course content in Amazon RDS, and all web traffic is routed through an Application Load Balancer (ALB). To comply with international data privacy regulations, the company must ensure that all sensitive information is encrypted both at rest and in transit. It must also protect the application from web-based threats such as SQL injection, cross-site scripting (XSS), and DDoS attacks, while continuously monitoring security events and generating real-time alerts for suspicious activities. Considering this scenario Design a secure cloud architecture that encrypts sensitive data both at rest and in transit using a centralized, auditable key management system, while simultaneously safeguarding the application against injection attacks, cross-site scripting, bot abuse, and volumetric traffic spikes.	10	2	3