



SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2025-2026

Programme Name & Branch : B.Tech (BBS)
Course Code and Course Name : CBS3005, Cloud, Microservices and Applications
Faculty Name(s) : Dr.P.Balakrishnan, Dr. A.Anny Leema
Class Number(s) : VL2025260502110, VL2025260502112
Date of Examination : 17-03-2026, 09.30 to 11.00 AM
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)
- Course Outcomes
 - 3. Learn how to use Cloud Services and to build applications.
 - 4. Realize security needs for cloud service and Analyze different SLAs
 - 5. Analyze platform-specific security features and management of security controls.

Q. No	Question	M	CO	BL
1.	ShopEZ, a fast-growing e-commerce platform, has recently migrated from a monolithic system to a microservices architecture. The platform consists of several independent services including an Order Service (running on port 8081) and a Payment Service (running on port 8082). During peak sales events (like flash sales), the Payment Service occasionally becomes overloaded and unresponsive, causing the Order Service to hang indefinitely while waiting for a response. This leads to cascading failures across the entire system — affecting thousands of customers trying to place orders simultaneously. Design and implement a suitable java-based solution with following specifications: Create the OrderController.java with a /place-order endpoint that calls the Payment Service at http://localhost:8082/payment	10	3	3
2.	Design and implement a java-based solution for TechMart, an online electronics retailer company with the following specifications: Implement two independent Spring Boot microservices: • Product Service — runs on port 8085, exposes /products to list available products. • Order Service — runs on port 8086, exposes /orders to manage customer orders. Currently, the frontend team must call both services directly using different URLs and ports, which is messy and hard to maintain. The CTO has asked you to introduce an API Gateway as a single entry point that routes: • Requests to /api/products/** → forwarded to the Product Service • Requests to /api/orders/** → forwarded to the Order Service All three components — the API Gateway, the Product Service, and the Order Service — must be containerized using Docker and orchestrated using a docker-compose.yml file so they start together as a system.	10	3	6
3.	MediCare Plus, a healthcare start-up, is migrating its patient management system to AWS. The system stores highly sensitive patient records including medical history, prescriptions, and credit card details for billing. The team has set up an			



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	Amazon EC2 instance running their application, an Amazon RDS database for patient records, and an Amazon S3 bucket for storing scanned documents. A junior developer recently argued that "AWS will handle all security since it's a cloud provider," and has left the EC2 operating system unpatched, S3 bucket access open to everyone, and sensitive data stored without encryption. As a senior developer, you are tasked with correcting these dangerous misconceptions by applying AWS shared responsibility model, two-step encryption process using KMS, and SSE-S3 with proper explanations.	10	4	4
4.	ShopSecure, an e-commerce company, recently launched a new web application on AWS hosted behind an Amazon CloudFront distribution and an Application Load Balancer. Within a week of launch, the security team detected multiple attack attempts including SQL injection queries in login forms, suspicious XSS scripts in product search inputs, and a sudden flood of 50,000 requests per minute from a single IP address suspected to be a DDoS bot. The application has no firewall protection currently, and the team urgently needs to deploy a suitable mechanism to safeguard it. As a security consultant, design and implement a suitable architecture and directions to protect the web application along with cost analysis to implement it to the ShopSecure.	10	4	5
5.	EduCloud, a fast-growing online learning platform serving over 500,000 students across the globe, recently migrated its entire infrastructure to the cloud, hosting its Learning Management System (LMS) on EC2 instances, storing student records and grades in cloud databases, serving course content through web applications, and managing user authentication through cloud-based identity services — however, within weeks of going live, the security team began noticing a series of alarming incidents: a student was repeatedly attempting to log in 50 times per minute suggesting a brute-force attack, an unknown user was making unauthorized API calls to change security group settings at odd hours, a professor suspected grade tampering after noticing unexpected changes in the database, a new software patch applied to the LMS was causing repeated application crashes and abnormal error logs, and during peak exam hours the platform was experiencing severe performance degradation with slow response times and high CPU utilization on servers — all of which went completely undetected because EduCloud had no security monitoring system in place. As the Cloud Security Architect, you are tasked with designing a generic security monitoring architecture for EduCloud that must follow the standard monitoring architecture flow.	10	5	5
