



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.													
----------	--	--	--	--	--	--	--	--	--	--	--	--	--

End - Term Examinations – May / June 2026

Date: 30 -05-2026

Time:01:00pm – 04:00pm

School: SOCSE	Program: B.Tech	
Course Code:CSE2285	Course Name: Cloud computing	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	24	24	24	14	14

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	List the five essential characteristics of cloud computing.	2 Marks	L1	C01
2.	Explain the term resource pooling in cloud environments.	2 Marks	L2	C01
3.	Explain how PaaS reduces application development complexity.	2 Marks	L2	C02
4.	Define Software as a Service (SaaS).	2 Marks	L1	C02
5.	What is fog computing?	2 Marks	L1	C03
6.	Mention any two characteristics of fog computing.	2 Marks	L1	C03
7.	Explain why organizations remain responsible for their data in cloud environments.	2 Marks	L2	C04
8.	Summarize the shared responsibility model in cloud security.	2 Marks	L2	C04
9.	List the three states of data in cloud computing.	2 Marks	L1	C05
10.	Explain the role of encryption in protecting data at rest.	2 Marks	L2	C05

Part B

Answer the Questions.

Total Marks 80M

11.	a.	A regional bank with strict data privacy regulations wants to move its IT infrastructure to the cloud. The bank handles sensitive customer financial data and must comply with data sovereignty laws. Describe the four cloud deployment models — Public, Private, Hybrid, and Community — including their key characteristics, ownership structure, and access control. Describe how each model addresses or fails to address the bank's requirements for data security, regulatory compliance, and operational control.	10Marks	L2	CO1
	b.	Explain the design principles of cloud computing and demonstrate their importance in cloud architecture.	10 Marks	L2	CO1
Or					
12.	a.	Scenario: A global logistics company is migrating from a traditional centralized mainframe system to a cloud-based distributed infrastructure. Stakeholders are concerned about availability, fault tolerance, and disaster recovery. Explain the transition from centralized to distributed computing and the limitations it overcomes. Describe how cloud computing achieves high availability and fault tolerance using redundancy, failover mechanisms, and data replication. Illustrate a disaster recovery approach using cloud services.	10 Marks	L2	CO1
	b.	Explain the architectural principles such as statelessness, horizontal scalability, and resilience in cloud systems.	10 Marks	L2	CO1
Or					
13.	a.	A cybersecurity company manages critical security workloads for multiple enterprise clients on a shared cloud platform. Each client's data must be completely isolated from others. Explain the concept of multitenancy in cloud computing and describe its implementation at the application, database, and infrastructure levels. Illustrate the security challenges present in a multi-tenant cloud environment — including data leakage risks, noisy neighbor effects, and unauthorized access — and describe the technical measures such as namespaces, role-based access control, and encryption that are used to address each challenge.	10 Marks	L3	CO2
	b.	Explain virtualization, its different types and its importance in cloud computing.	10 Marks	L2	CO2
Or					
14.	a.	An e-learning platform currently runs on virtual machines using a Type 1 hypervisor. The development team wants to	10 Marks	L3	CO2

		understand containers before considering a switch to improve deployment speed and scalability. Explain the architecture of Virtual Machines and Containers, highlighting how each handles the operating system, resource allocation, and application isolation. Compare them across the parameters of OS architecture, resource utilization, startup time, isolation strength, security, and typical use cases using a tabular format. Apply this comparison to describe the specific advantages containers would offer for the e-learning platform's course delivery system.			
	b.	Describe IAAS, PAAS, and SAAS cloud service models with suitable examples in detail.	10 Marks	L2	CO2

15.	a.	An industrial manufacturing plant has 200 machines equipped with vibration and temperature sensors. Sensor data is currently uploaded to the cloud for predictive maintenance analysis. The plant operations team reports that by the time failure alerts arrive, the machines have already broken down. Explain the motivation for edge computing in industrial IoT environments. Describe how deploying edge intelligence and AI at the edge would enable real-time predictive maintenance. Compare the response time, bandwidth usage, and reliability of the edge-based approach versus the existing cloud-only approach for this use case.	10 Marks	L3	CO3
	b.	Describe the role of the Data Acquisition Layer and the Edge Layer in edge computing architecture.	10 Marks	L2	CO3

Or

16.	a.	A smart city initiative wants to deploy environmental monitoring sensors across 1,000 locations to measure air quality, noise levels, and temperature in real time. The data must be acted upon locally to trigger alerts (e.g., for pollution spikes) while also being aggregated for long-term city planning. Describe the application scenarios of edge and fog computing relevant to smart city deployments. Explain how fog nodes at district level and edge nodes at sensor level would divide the processing responsibilities. Describe the data flow from sensor to edge to fog to cloud in this smart city monitoring system.	10 Marks	L3	CO3
	b.	Explain the concept of fog computing and discuss its purpose, characteristics, and working mechanism.	10 Marks	L2	CO3

17.	a.	A cloud-hosted SaaS application serving 50,000 users has experienced a series of failed login attempts from multiple geographic locations over 24 hours. The security team suspects	10 Marks	L3	CO4
------------	-----------	---	-----------------	-----------	------------

		a credential stuffing attack and is concerned about account takeover. Demonstrate the nature of credential stuffing as a cloud threat and describe the broader category of identity-based threats and vulnerabilities in cloud environments. Describe the IAM controls — including MFA, anomaly detection, account lockout policies, and privileged access management — that should be applied to detect and mitigate this type of attack.			
	b.	Demonstrate the management, operational, and technological aspects of cloud security.	10 Marks	L3	C05
Or					
18.	a.	A cloud-native company uses a mix of symmetric and asymmetric encryption for protecting data in its applications. The key management team is struggling with key rotation, key storage, and ensuring keys are not exposed in application code. Explain the fundamentals of encryption including symmetric and asymmetric encryption, their use cases, and their differences. Describe the role and functions of a Key Management Service (KMS) — including key generation, rotation, access control, and auditing. Apply this understanding to describe the best practices the company should follow for key storage, rotation schedules, and preventing key exposure in application code.	10 Marks	L3	C04
	b.	Illustrate the importance of IAM in cloud security with suitable examples.	10 Marks	L3	C05