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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E.

Semester: VI

Branch: Computer Science and Engineering

Duration: 3 hrs.

Course Code: 23CS6PCCCT

Max Marks: 100

Course: Cloud Computing

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I			CO	PO	Marks
Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.	1	a)	Define Cloud Computing. Discuss the NIST cloud deployment and service models with a diagram.			<i>CO1</i>	<i>PO1</i>	7
		b)	Compare the benefits and drawbacks of cloud computing with respect to traditional systems.			<i>CO1</i>	<i>PO1</i>	8
		c)	A user want to deploy and run a web application without managing the underlying hardware. Which service model would be most suitable for the above scenario? Justify your answer.			<i>CO2</i>	<i>PO2</i>	5
			OR					
	2	a)	A startup company is planning to launch an online collaboration tool and is considering migrating its infrastructure to the cloud. As a consultant, how would you evaluate whether a cloud provider meets the essential characteristics of cloud computing. Illustrate your answer with practical considerations and examples.			<i>CO1</i>	<i>PO1</i>	6
		b)	Demonstrate how does the cloud reference model represent cloud computing's service models in terms of a hardware/software stack with a diagram. Also, explain with suitable examples of service providers at each level of the stack.			<i>CO2</i>	<i>PO2</i>	8
		c)	Differentiate among three service models in cloud computing with examples. Illustrate how cloud computing has changed the nature of commercial system deployment.			<i>CO1</i>	<i>PO1</i>	6
			UNIT - II					
	3	a)	Justify how does baselines and defining metrics support effective performance monitoring and resource optimization in IT systems.			<i>CO2</i>	<i>PO2</i>	10

	b)	Discuss the need for virtualization and what makes virtualization possible. Demonstrate the different levels in which a hypervisor operates and controls the hardware resource allocation with diagrams.	CO2	PO2	10
		OR			
4	a)	Define VMware vSphere and elaborate on how it contributes to the creation of cloud computing infrastructures through the virtualization of system, storage, and networking hardware.	CO2	PO2	10
	b)	Justify how capacity planning ensures optimal resource allocation for a high-traffic web application during peak usage periods in a cloud environment. Explain the steps involved in capacity planning.	CO2	PO2	10
		UNIT - III			
5	a)	<p>A company is developing a cloud-native analytics platform that must store and process time-series data generated by IoT devices. The system requires fast writes, efficient storage, and the ability to scale with incoming data spikes. Query complexity is low, focusing mainly on time-based filtering. Operational simplicity, horizontal scalability, and high availability are key requirements.</p> <p>a) Based on the scenario above, would you choose Amazon SimpleDB or Amazon RDS? Justify your choice.</p> <p>b) What are the fundamental differences between Amazon SimpleDB and Amazon RDS</p>	CO3	PO3	10
	b)	Describe the key steps involved in creating an account and instance on EC2 through the AWS management console.	CO3	PO3	10
		OR			
6	a)	<p>A user is building a global e-commerce application with customers across multiple continents. Ensuring fast content delivery, reduced latency, and scalability during peak sales events is critical.</p> <p>a) How can AWS CloudFront help in meeting these requirements? Explain its key advantages.</p> <p>b) Compare Amazon S3 and Amazon EBS in terms of their storage model, use cases, and access patterns.</p>	CO3	PO3	10
	b)	Illustrate the simple storage system and block storage service of AWS with example. List the advantages of each. Compare Salesforce.com and Force.com applications in terms of their roles as SaaS and PaaS platforms.	CO3	PO3	10

UNIT - IV						
7	a)	Demonstrate the Cloud Security Alliance Reference Model including defined security boundaries with a diagram. Provide a detailed explanation of the security responsibilities at each layer of the cloud service stack model.	<i>CO2</i>	<i>PO2</i>	10	
		Discuss the purpose of using a layered access model involving a broker and a proxy in cloud storage architecture with a diagram. Does this model help isolate storage from direct client access? Justify your answer.				
OR						
8	a)	When migrating an on-premises enterprise application to the cloud, not all components and functionalities map directly to cloud-native services. Discuss about functionality mapping in the context of cloud migration. Is there any potential risks or challenges that may arise if functionality mapping is not done correctly? Justify your answer.	<i>CO2</i>	<i>PO2</i>	10	
		A global airline's reservation system, hosted on a private cloud, handles around 10,000 bookings per hour but spikes to over 100,000 during peak seasons. This leads to latency and outages. As a cloud architect, design a cloud bursting strategy to manage these traffic surges effectively.				
UNIT - V						
9	a)	Define Kubernetes and need of Kubernetes. Discuss the main components of its architecture with a diagram.	<i>CO2</i>	<i>PO2</i>	10	
		Describe the steps to move from a monolithic system to an event-driven architecture, and how would you handle challenges like data consistency and communication?				
OR						
10	a)	Discuss about the functionalities of various components of Kubernetes.	<i>CO2</i>	<i>PO2</i>	10	
		Justify how does the Kubernetes Autoscaling API help manage application scalability. Explain the roles of key Kubernetes components involved in this process.				
