

Nirma University

Institute of Technology

Semester End Examination (IR), May - 2023
B. Tech. in Computer Science and Engineering, Semester-VI
2CSDE67 Cloud Computing

Roll /
Exam
No.

Supervisor's
initial with date

Time: 3 Hours

Max. Marks: 100

- Instructions:
1. Attempt all questions.
 2. Figures to the right indicate full marks.
 3. Use a section-wise separate answer book.
 4. Draw neat sketches wherever necessary.

SECTION - I

Q-1 Answer the following. [18]

- (A) What are the benefits and challenges associated with virtualizing CPUs, memory, and I/O devices in Cloud computing environments, and how can these challenges be mitigated? (6)
CO2 BL3
- (B) What is the concept of Cloud bursting architecture, and how does it enable organizations to seamlessly scale their workload beyond the capacity of their private Cloud to a public Cloud, ensuring business continuity and cost optimization? (6)
CO1 BL2
- (C) How does para virtualization achieve better performance compared to full virtualization? In what scenarios or use cases is full virtualization more suitable, and when is paravirtualization preferred? (6)
CO2 BL3

Q-2 Answer the following. [18]

- (A) How do Cloud usages cost metrics, such as pay-per-use, data transfer fees, and storage costs, influence the financial considerations and decision-making process for organizations utilizing Cloud services? Also, provide an example for each metric mentioned here. (6)
CO4 BL3

- (B) CO3 BL2 How does the High Availability (HA) feature of VI managers minimize application downtime and prevent business disruption? What additional fault tolerance measures are implemented for mission-critical applications in VI managers? (6)

OR

- (B) CO3 BL2 How can organizations leverage specialized Cloud mechanisms, such as disaster recovery systems and data encryption to enhance their Cloud infrastructure's security, performance, and compliance with industry regulations? (6)

- (C) CO1 BL2 How do service quality metrics and SLAs contribute to the evaluation and selection of Cloud service providers, and how can organizations assess and compare the service quality commitments of different providers? Also, mention how the under-provisioning and over-provisioning are associated with the metrics and SLAs. (6)

OR

- (C) CO1 BL2 Provide examples of scenarios (with proper labeled diagram) where a failover system successfully switched over to a redundant or standby IT resource instance, ensuring uninterrupted availability. (6)

Q-3 Do as directed [14]

- (A) CO3 BL3 In what situations would a QoS-aware admission control mechanism be implemented? How does it determine which requests to admit or reject based on the anticipated system resource consumption? Also, provide examples of scenarios where certain types of requests or sessions would be rejected or admitted based on the admission control mechanisms in place. (7)

- (B) CO1 BL2 How does the adoption of IaaS, PaaS, and SaaS models influence the Cloud provider's ability to deliver reliable and high-performance services, and how does it impact the Cloud consumer's ability to meet their business objectives and deliver a seamless user experience? (7)

SECTION - II

- Q-4 Answer the following. [18]**
- (A) CO3 BL3 Mention the architecture of the Cloud Security Defense Strategies and also write the associated security, privacy, and copyright protection measures needed at various Cloud service levels. (10)
- (B) CO3 BL5 What measures are in place to mitigate insider threats in the context of Cloud security? Also, provide any four examples of security protocols or practices that your organization implements to tackle these major Cloud security threats. (8)
- Q-5 Answer the following. [18]**
- (A) CO4 BL5 What are the potential consequences of not having a failover system in place for mission-critical programs? How does the use of failover systems impact the overall performance and user experience of the applications or services relying on them? (6)
- (B) CO1 BL5 How does the SLA management system utilize the data collected by the SLA monitor to effectively manage and enforce SLAs? (6)
- OR**
- (B) CO1 BL5 What challenges arise from the lack of standard methods for storing user data and applications in current Cloud computing infrastructures? How does the absence of standardization in Cloud computing platforms affect the interoperability and portability of user data? (6)
- (C) CO3 BL6 What challenges are associated with capacity management and demand prediction in Cloud infrastructures? (6)
- OR**
- (C) CO3 BL6 What are the three steps involved in the risk control stage of risk management? Also, explain each step in detail and their significance in managing risks. (6)

Q-6 Do as directed**[14]**(A)
CO1 BL3

(7)

How do admission control algorithms determine which requests should be admitted into the application server during heavy load situations?

Also, For the given Table I, Write at least two Cloud Mechanisms for the provided Cloud Characteristics in Column 1.

Table I

Cloud Characteristics	Cloud Mechanisms
On-demand usages	Write Cloud Mechanism "1" for on-demand access.
	Write Cloud Mechanism "2" for on-demand access.
Measured Services	Write Cloud Mechanism "1" for Measured Services.
	Write Cloud Mechanism "2" for Measured Services.
Resiliency	Write Cloud Mechanism "1" for Resiliency.
	Write Cloud Mechanism "2" for Resiliency.
Elasticity	Write Cloud Mechanism "1" for Elasticity.
	Write Cloud Mechanism "2" for Elasticity.

(B)
CO2 BL4

(7)

How does a resource management system contribute to the efficient allocation and utilization of resources in a Cloud environment, and what are the key features and benefits it provides to both Cloud providers and consumers?
