

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S7 (R,S) Examination November 2025 (2019 Scheme).

Course Code: CDT401

Course Name: CONCEPTS IN CLOUD COMPUTING

Max. Marks: 100**Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks.

Marks

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|----|--|-----|
| 1 | Compare traditional computing with cloud computing and identify three major limitations of traditional computing that cloud computing addresses. | (3) |
| 2 | State the fundamental differences in user control and management responsibility between IaaS and PaaS. | (3) |
| 3 | Define hypervisor and distinguish between Type 1 and Type 2 hypervisors with examples. | (3) |
| 4 | Explain the concept of Memory Virtualization and its significance in cloud environments. | (3) |
| 5 | List any three <i>Infrastructure-as-a-Service (IaaS)</i> services from major cloud service providers and their use cases. | (3) |
| 6 | Name three key features that distinguish the Eucalyptus cloud platform. | (3) |
| 7 | Briefly describe the architecture of HDFS (Hadoop Distributed File System). | (3) |
| 8 | How does the design of the Google File System (GFS) prioritize high-throughput batch processing over low-latency data access? | (3) |
| 9 | What challenges do SaaS providers face in ensuring customer security through Service Level Agreements (SLAs)? | (3) |
| 10 | Explain concepts of: <ul style="list-style-type: none">• Confidentiality• Integrity• Availability | (3) |

And explain their importance in cloud computing.

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- 11 a) Describe the *Service-Oriented Architecture (SOA)* approach in cloud computing. (7)
Explain how it supports scalability and interoperability.
- b) Compare *public* and *private* cloud deployment models in terms of cost, control, (7)
and customization.

OR

- 12 a) Evaluate four different system models used for distributed and cloud computing (8)
(Cluster, Grid, P2P and Cloud).
- b) A healthcare organization handles sensitive patient data and requires high security (6)
but also needs to leverage public cloud resources for non-sensitive operations.
Recommend an appropriate cloud deployment model and explain how it addresses
their requirements.

Module II

- 13 a) Explain the concepts and significance of Virtualization mechanisms such as Trap- (7)
and-Emulate and Binary Translation in achieving virtualization on non-
virtualizable hardware.
- b) Give an outline of *data centre virtualization* and discuss its low-cost design (7)
philosophy.

OR

- 14 a) Distinguish between Full Virtualization and Para-virtualization based on their (7)
requirement for hardware support, guest OS modification, and overall
performance overhead.
- b) Explain CPU virtualization in detail. Describe the techniques used to virtualize (7)
CPU resources and discuss the challenges involved.

Module III

- 15 a) Write short notes on the following services offered by public cloud providers: (8)

- a) Amazon EC2
 - b) Azure Virtual Machines
 - c) Google Firebase
 - d) AWS Lambda
- b) Explain how *Service-Level Agreements (SLAs)* are negotiated and enforced in the context of a *Market-oriented cloud architecture*. (6)

OR

- 16 a) Your organization is planning to transition to the cloud. The management has shortlisted Google Cloud Platform (GCP) and Microsoft Azure as potential platforms. Prepare a concise comparison of these two providers, evaluating their key features, services offered, and suitable use cases to help management make an informed decision. (7)
- b) An e-commerce company experiences unpredictable traffic patterns with sudden spikes during sales events. Analyze the resource provisioning strategies they should adopt. (7)

Module IV

- 17 a) For a dataset containing product sales, write Pig Latin queries to: (8)
1. Select records with sales above ₹10,000.
 2. Calculate total sales per region.
 3. Combine sales data with product information.
 4. Sort the records by total sales in descending order.
- b) Explain the logical data flow of MapReduce framework with a neat diagram and using a suitable example. (6)

OR

- 18 a) Imagine you are organizing an online coding competition. Discuss the various ways you can utilize cloud resources to conduct the event smoothly and effectively. (7)
- b) Explain the process of writing a file into the *HDFS* focusing on *block placement and replication*. (7)

Module V

- 19 a) Discuss the common security threats and vulnerabilities associated with multi-tenancy in a cloud environment. What measures can a cloud provider take to ensure tenant isolation? (7)
- b) Discuss three major Application Security issues that arise when migrating enterprise applications to the cloud (7)

OR

- 20 a) Describe the risk management strategies in cloud computing. How do organizations identify, assess, and mitigate security risks in cloud environments? (7)
- b) Outline the key phases of a cloud forensics framework, from incident identification to reporting, and explain the unique challenges of the "Evidence Collection" phase in a virtualized environment. (7)
