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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2024- 2025)

Subject: Cloud Computing

Time: 3 Hours

Max. Marks: 100

General Instructions:*IMP: Verify that you have received the question paper with the correct course, code, branch etc.**1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.**2. Maximum marks for each question are indicated on right -hand side of each question.**3. Illustrate your answers with neat sketches wherever necessary.**4. Assume suitable data if necessary.**5. Preferably, write the answers in sequential order.**6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.***SECTION-A**

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1. Attempt all parts:-

1-a. Cloud computing's cost-effectiveness is primarily attributed to: (CO1, K1)

1

- (a) The high upfront costs
- (b) On-demand resource provisioning
- (c) Fixed pricing models
- (d) Limited scalability options

1-b. Multi-tenancy refers to: (CO1, K1)

1

- (a) The cloud's ability to host only one user at a time
- (b) Multiple users sharing the same resources and infrastructure
- (c) Dedicated servers for each user in the cloud
- (d) Limited access to cloud services by multiple users

1-c. CPU virtualization allows_____.(CO2, K2)

1

- (a) Multiple CPUs to be seen as a single CPU
- (b) Multiple virtual CPUs to run on a single physical CPU
- (c) CPUs to emulate RAM
- (d) CPUs to operate without a virtual machine

1-d. The main function of I/O device virtualization is to: (CO2, K2)

1

- (a) Emulate hardware components
- (b) Enhance CPU performance
- (c) Improve memory allocation

- (d) Optimize network speed
- 1-e. In SOA, Service contract is a _____. (CO3, K2) 1
- (a) A legally binding document
 - (b) An agreement between service providers and users
 - (c) An architectural pattern
 - (d) A technical interface description
- 1-f. In a hybrid cloud, _____ determines which data and applications are stored in each cloud type. (CO3, K2) 1
- (a) Random allocation
 - (b) Security policy and compliance needs
 - (c) Availability of resources
 - (d) Geographical location
- 1-g. AWS EFS is a type of _____. (CO4, K1) 1
- (a) Object Storage
 - (b) Block Storage
 - (c) File Storage
 - (d) NoSQL Database
- 1-h. _____ is used for relational databases and is managed by AWS. (CO4, K1) 1
- (a) Amazon S3
 - (b) Amazon RDS
 - (c) Amazon EBS
 - (d) Amazon DynamoDB
- 1-i. A common challenge in cloud computing related to data privacy. (CO5, K2) 1
- (a) Data backup
 - (b) Data transfer speed
 - (c) Data security and compliance
 - (d) Data redundancy
- 1-j. Multi-factor Authentication (MFA) commonly involves: (CO5, K2) 1
- (a) Using a single factor for user authentication
 - (b) Verifying identity with multiple credentials
 - (c) Applying role-based permissions
 - (d) Allowing access without any verification
2. Attempt all parts:-
- 2.a. Identify the relationship between grid computing and cloud computing. (CO1, K2) 2
- 2.b. Explain network virtualization and its advantages in modern networking setups. (CO2, K2) 2
- 2.c. Enlist the core components of the NIST Cloud Computing Reference Architecture. (CO3, K1) 2

- 2.d. Explain the purpose of Subnets within a VPC. (CO4, K2) 2
- 2.e. Define a DDoS attack and its impact on cloud services. (CO5, K2) 2

SECTION-B

30

3. Answer any five of the following:-

- 3-a. Identify the way multi-tenancy optimizes resource utilization in the cloud. (CO1, K2) 6
- 3-b. Discuss the challenges associated with forecasting costs in cloud computing. (CO1, K2) 6
- 3-c. Analyze the way "dynamic resource allocation" enhances the efficiency of virtualized environments. (CO2, K4) 6
- 3-d. Explain the concept of a virtual machine and differentiate it from a physical machine. (CO2, K4) 6
- 3.e. Describe the fundamental concept of the publish-subscribe model in detail. (CO3, K2) 6
- 3.f. Examine the way, RDS handles backup and restore operations for databases. (CO4, K4) 6
- 3.g. Analyze the way integration of AI and Machine Learning techniques contribute to preventing, detecting and responding to cloud-based security issues. (CO5, K4) 6

SECTION-C

50

4. Answer any one of the following:-

- 4-a. Discuss the role of key players (such as Amazon, Google, and Microsoft) in shaping the evolution of cloud computing. (CO1, K2) 10
- 4-b. Explain the fundamental differences between parallel and distributed computing. (CO1, K2) 10

5. Answer any one of the following:-

- 5-a. Discuss the role of APIs in virtualization management and orchestration. (CO2, K2) 10
- 5-b. Enlist and discuss 5 popular virtualization tools available in the market and their specific use cases. (CO2, K2) 10

6. Answer any one of the following:-

- 6-a. Explain the fundamental principles of web services and analyze its role in enhancing interoperability. (CO3, K4) 10
- 6-b. Explore the roles and functions of Cloud Consumer, Cloud Provider, Cloud Auditor, and Cloud Carrier within the cloud ecosystem. Relate their contribution to service delivery, governance, and security. (CO3, K4) 10

7. Answer any one of the following:-

- 7-a. Compare the benefits and limitations of using RDS and DynamoDB for managing databases in a cloud infrastructure, especially in terms of scalability and ease of maintenance. (CO4, K4) 10

- 7-b. Detail the essential components of a Virtual Private Cloud (VPC) and subnets within the cloud network infrastructure. Contrast their roles in resource isolation and traffic routing. (CO4, K4) 10
8. Answer any one of the following:-
- 8-a. Explain the relationship between authentication, authorization, and access control in ensuring a cohesive and secure user experience in the cloud. Also discuss the way these elements collectively contribute to a strong security posture. (CO5, K2) 10
- 8-b. Considering the diversity of user roles and access requirements, discuss the challenges in implementing and managing robust role-based access controls in a cloud infrastructure. (CO5, K2) 10

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