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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024- 2025)

Subject: Foundation of 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 is a _____ system and it is necessarily unidirectional in nature.(CO1,K1) 1

(a) stateless

(b) stateful

(c) reliable

(d) all of the mentioned

1-b. 'Pay as you go' is best suited when: (CO1,K1) 1

(a) Over provisioning is available.

(b) Under provisioning is available

(c) Both A and B

(d) D. Over provisioning and Under provisioning both are not available

1-c. Select one of the following network resources that can be load balanced. (CO2,K1) 1

(a) Connections through intelligent switches

(b) DNS

(c) Storage resources

(d) All of the mentioned

1-d. Bare metal is.....hypervisor. (CO2,K1) 1

(a) Type 1

- (b) Type 2
 - (c) Type 3
 - (d) All of the mentioned
- 1-e. _____ is the feature of cloud computing that allows the service to change in size or volume in order to meet a user's needs. (CO3,K1) 1
- (a) Scalability
 - (b) Virtualization
 - (c) Security
 - (d) Cost-savings
- 1-f. The componentized nature of SaaS solutions enables many solutions to support a feature called _____.(CO3,K1) 1
- (a) workspace
 - (b) workloads
 - (c) mashups
 - (d) all of the mentioned
- 1-g. Select one of the following which define inter-cloud resource management.(CO4,K2) 1
- (a) Managing resources within a single cloud
 - (b) Coordinating resources across multiple cloud environments
 - (c) Allocating hardware resources in private clouds
 - (d) Managing on-premises data centers
- 1-h. To find the best security-as-a-service offering for your organization: (CO4,K2) 1
- (a) Ask the vendor what they recommend
 - (b) Assess your requirements, do a risk assessment and a cost/benefit analysis of the options
 - (c) Find the cheapest monthly option and use whatever is offered with that service
 - (d) Ask your peers and do exactly what they're doing
- 1-i. is the primary goal of OpenStack. (CO5,K1) 1
- (a) Closed-source development
 - (b) Building proprietary cloud solutions
 - (c) Creating open-source cloud infrastructure
 - (d) Restricting interoperability
- 1-j. Select one of the following that is a notable feature of the programming environment for Google App Engine.(CO5,K2) 1
- (a) Limited scalability options
 - (b) Built-in scalability
 - (c) Manual scaling
 - (d) Static scaling

2. Attempt all parts:-

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|------|------------------------------------------------------------------------------|---|
| 2.a. | Define cloud computing with suitable example. (CO1,K1) | 2 |
| 2.b. | List two advantages of SOA. (CO2,K1) | 2 |
| 2.c. | List the five roles defined by NIST in cloud computing. (CO3,K1) | 2 |
| 2.d. | Mention two challenges in managing resources across multiple clouds.(CO4.K1) | 2 |
| 2.e. | Discuss federation in the cloud. (CO5,K2) | 2 |

SECTION-B

30

3. Answer any five of the following:-

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 3-a. | Recognize the 5 advantages and 5 disadvantages of cloud computing for businesses with suitable real-time examples. (CO1,K2) | 6 |
| 3-b. | Discuss the key characteristics of cloud computing, including resource pooling, broad network access, and measured service. (CO1,K2) | 6 |
| 3-c. | Describe the lifecycle of a service in SOA and discuss the role of a service registry with suitable examples. (CO2,K2) | 6 |
| 3-d. | Express virtualization with suitable example and explain its key benefits and limitations in modern IT environments.(CO2,K2) | 6 |
| 3.e. | Distinguish the features of cloud storage that make it suitable for enterprise data backup and disaster recovery. (CO3,K4) | 6 |
| 3.f. | Analyze the role of Identity and Access Management in cloud computing. Discuss role-based access control (RBAC) and mention two benefits of implementing IAM in cloud systems. (CO4,K4) | 6 |
| 3.g. | Distinguish and discuss how Google App Engine's auto-scaling feature benefits developers in handling unpredictable workloads.(CO5,K4) | 6 |

SECTION-C

50

4. Answer any one of the following:-

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|------|----------------------------------------------------------------------------------------------------------------------------------------------|----|
| 4-a. | Explain the evolution of cloud computing and also describe the underlying principles of parallel and distributed computing. (CO1,K2) | 10 |
| 4-b. | Discuss how AWS EC2 instance families (General Purpose, Compute Optimized, Memory Optimized, etc.) meet different application needs.(CO1,K2) | 10 |

5. Answer any one of the following:-

- | | | |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 5-a. | Describe the architecture of virtualization systems with suitable examples, focusing on the role of hypervisors and management tools. (CO2,K2) | 10 |
| 5-b. | Compare and contrast RESTful and SOAP-based web services in terms of design, protocol, performance, and security. Discuss which one you would recommend for modern applications with a suitable reason.(CO2,K5) | 10 |

6. Answer any one of the following:-

- | | | |
|------|--------------------------------------------------------------------------------------------------------------------------------------|----|
| 6-a. | Compare public, private, and hybrid clouds in detail, focusing on their architecture, security, scalability, and use cases. (CO3,K5) | 10 |
| 6-b. | Compare Amazon S3, RDS, and EBS in terms of architecture, functionality, and | 10 |

use cases. Provide detailed examples of when to use each. (CO3,K5)

7. Answer any one of the following:-

- 7-a. Analyze the role of interoperability and standardization in inter-cloud systems. Discuss their benefits and challenges. (CO4,K4) 10
- 7-b. Recognize security governance in the context of cloud computing and its key components. (CO4,K2) 10

8. Answer any one of the following:-

- 8-a. Analyze how the shared responsibility model influences the implementation of cloud security. (CO5,K4) 10
- 8-b. Express the challenges in achieving seamless identity management and access control in federated cloud environments. (CO5,K2) 10

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