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Printed Page:-4 **Subject Code:- BCSBS0512**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech
SEM: V - THEORY EXAMINATION (2025 - 2026)
Subject: Cloud, Microservices & Application

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

20

1. Attempt all parts:-

1-a. In a hybrid cloud, which component is primarily responsible for workload orchestration between private and public clouds? (CO1,K1) 1

(a) Load balancer
(b) Cloud broker
(c) Hypervisor
(d) API gateway

1-b. Applications and services that run on a distributed network using virtualized resources is known as : (CO1,K2) 1

(a) Parallel computing
(b) Soft computing
(c) Distributed computing
(d) Cloud computing

1-c. _____ Spring annotation is used to create RESTful web services using Spring MVC.(CO2,K1) 1

(a) @RestController
(b) @Controller
(c) @Component
(d) @Rest

1-d. Microservices architecture adapts which of the following concepts? (CO2,K1) 1

(a) Web Services/HTTP
(b) OOPs
(c) SOA

(d) All of the above

1-e. Mention some of the useful plugins in Jenkin_____. (CO3,K2) 1

(a) Copy artifact
(b) HTML publisher
(c) All of the above
(d) None of the above

1-f. _____ of the following is not a part of Develops life cycle .(CO3,K1) 1

(a) Code
(b) Plan
(c) Build
(d) Operating

1-g. Once the container has stopped, which of the following command you will use to remove a container? (CO4,K2) 1

(a) Docker remove
(b) Docker Destroy
(c) Docker rm
(d) Docker Delete

1-h. Kube-apiserver on kubernetes master is designed to scale.(CO4,K2) 1

(a) Vertically
(b) Horizontally
(c) Both (A) and (B)
(d) None of the above

1-i. Cloud security deals mainly with safeguarding data, applications, and infrastructure in virtual environments.(CO5,K1) 1

(a) Data confidentiality
(b) Network traffic
(c) Application design
(d) Hardware devices

1-j. A firewall in cloud acts as a barrier controlling network traffic.(CO5,K2) 1

(a) Routing engine
(b) Traffic filter
(c) Scheduler
(d) Gateway switch

2. Attempt all parts:-

2.a. Explain the pay-as-you-go pricing model in cloud computing. (CO1,K1) 2

2.b. Discuss the advantages of using APIs in software development.(CO2,K1) 2

2.c. State the importance of version control in DevOps.(CO3,K2) 2

2.d. List the main components of Kubernetes architecture. (CO4, K2) 2

2.e. Define cloud workload protection in virtualized environments.(CO5,K4) 2

SECTION-B 30

3. Attempt all parts:-

3.a. Answer any one of the following:-

3.a.(i)	Compare AWS, Microsoft Azure, and Google Cloud Platform (GCP) in terms of key services, pricing models, and typical use cases. (CO1, K2)	6
3.a.(ii)	Explain the concept of cloud-native applications and discuss the key advantages of using cloud-native architecture for modern software development. (CO1, K2)	6

3.b. Answer any one of the following:-

3.b.(i)	Discuss the importance of API documentation in the development and integration process. How does well-documented API enhance collaboration between development teams?(CO2,K4)	6
3.b.(ii)	Illustrate the challenges that may arise in maintaining data consistency across microservices with independent databases.(CO2,K4)	6

3.c. Answer any one of the following:-

3.c.(i)	Describe the role of Nagios in IT infrastructure monitoring and explain how it helps detect and respond to system or network issues. (CO3, K2)	6
3.c.(ii)	Explain the working of Git and describe a basic Git workflow, including cloning, branching, committing, pushing, and merging changes. Illustrate with a simple diagram.(CO3,K2)	6

3.d. Answer any one of the following:-

3.d.(i)	Examine the Docker container lifecycle and explain how different stages impact application state and data persistence.(CO4,K4)	6
3.d.(ii)	Compare Kubernetes and Docker Swarm as container orchestration tools in terms of architecture, scalability, fault tolerance.(CO4,K4)	6

3.e. Answer any one of the following:-

3.e.(i)	Explain the main components of a cloud security architecture and how they help protect data confidentiality and integrity. (CO5, K2)	6
3.e.(ii)	Evaluate the use of AI for predictive cloud security monitoring, including its benefits and potential challenges.(CO5,K5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain how Cloud Workload Protection Platforms (CWPP) help secure applications and data across hybrid and multi-cloud environments. Discuss their key features and benefits.(CO1,K4)	10
4-b.	Discuss the impact of choosing a particular cloud service model on application performance, security, and deployment speed. Illustrate with real-world examples.(CO1,K4)	10

5. Answer any one of the following:-

5-a.	Explain the key principles of microservices architecture and describe how it differs from monolithic architecture. Include examples of advantages and challenges. (CO2, K2)	10
5-b.	Explain the role of HTTP methods (GET, POST, PUT, DELETE) in API communication. Provide real-world scenarios where each method is appropriately used.(CO2,K2)	10

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6. Answer any one of the following:-

6-a.	Evaluate how Jenkins can be architected and optimized to support large-scale, distributed continuous integration and continuous delivery (CI/CD) pipelines, ensuring scalability, fault tolerance, and security across hybrid or multi-cloud environments.(CO3,K5)	10
6-b.	Describe the role of a Kubernetes Pod. How does it relate to containers, and how does it contribute to the organization of applications within a cluster?(CO3,K2)	10

7. Answer any one of the following:-

7-a.	Analyze the role of Kubernetes Services and Ingress in managing network communication between Pods and external clients. (CO4, K4)	10
7-b.	Explain the detailed procedure and best practices for performing maintenance activities on a Kubernetes node.(CO4,K4)	10

8. Answer any one of the following:-

8-a.	Explain the evolution of cloud security architecture and its impact on protecting modern enterprise infrastructures. Include key models and best practices. (CO5, K5)	10
8-b.	Explain the difference between DoS and DDoS attacks. Discuss their impact on network and application availability and mention common mitigation techniques.(CO5,K4)	10