BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – MCA-2020/MCA-2022/MCA-2023
Course Name – Cloud Computing
Course Code - MCA304B
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) What is the primary purpose of the Cloud Cube Model?

a) To categorize cloud networks based on their deployment models
b) To define the NIST reference model for cloud computing
c) To identify the boundaries of cloud services between providers and consumers
d) To categorize cloud networks based on their physical location, ownership, security boundary, and sourcing

(ii) What is the correct purpose of workload distribution architecture in cloud computing?

a) To reduce the number of IT resources
b) To increase over-utilization of resources
c) To horizontally scale IT resources
d) To centralize IT resources

(iii) What is the message format of SOAP ?

a) JavaScript
b) JSON
c) Extensible Markup Language (XML)
d) HTML

(iv) Identify the correct AWS service that allows administrators to automatically adjust the number of EC2 instances based on demand.

a) AWS IAM (Identity and Access Management)
b) AWS CloudWatch
c) AWS Auto Scaling
d) AWS Trusted Advisor

(v) Indicate the main difference between Service Orchestration and Service Choreography in Service-Oriented Architecture (SOA).

a) Orchestration involves a centralized coordination function, while choreography is a cooperative affair with no central coordination.
b) Orchestration uses middleware like ESB, while choreography relies on communication protocols like REST.
c) Orchestration is used in monolithic cloud applications, while choreography is essential for diverse cloud services.
d) Orchestration is used for client construction, while choreography is used for component construction.

(vi) Why did Elastic Load Balancing benefit applications host on multiple EC2 instances?

a) It enhances application security.
b) It simplifies resource provisioning.
c) It distributes incoming traffic for improved availability and fault tolerance.
d) It manages IAM roles.

(vii) Choose the correct language specification that is often used to model SLAs.

a) WSLA
b) ASLA
c) CSLA
d) DLSA

(viii) Identify the GCP service that is ideal for running fast SQL queries on large datasets and is suitable for business intelligence and data analytics.

a) BigQuery
b) Cloud Firestore
c) Cloud Pub/Sub
d) Cloud Datastore

(ix) Select the AWS service that simplifies Extract, Transform, Load (ETL) processes for data preparation and analytics.

a) AWS Glue
b) Amazon DynamoDB
c) AWS Lake Formation
d) Amazon S3

(x) Identify what the automated scaling listener does in cloud bursting when the on-premises service load exceeds a threshold value.

a) Redirects traffic towards the replicated implementation in the external cloud.
b) Halts the system to prevent overload.
c) Triggers the resource replication process.
d) Releases the external cloud service.

(xi) Mention a key advantage of distributed databases.

a) Efficient storage of files across multiple servers
b) Transparent file access regardless of location
c) Scalability, fault tolerance, and high availability
d) Collaboration for scientific tasks

(xii) Examine the protocol commonly used for streamed media scenarios due to its lower emphasis on fidelity.

a) Transmission Control Protocol (TCP)
b) User Datagram Protocol (UDP)
c) Hypertext Transfer Protocol (HTTP)
d) Simple Mail Transfer Protocol (SMTP)

(xiii) What do you mean by the Sourcing dimension in Cloud Cube Model?

a) The geographical location of data centers
b) Whether the service is provided by the customer or a service provider
c) The technology used for cloud deployment
d) The degree of integration with other cloud services

(xiv) Select the technology that allows multiple application instances to be managed dynamically in cloud environments.

a) Load balancing
b) Virtualization
c) System imaging
d) Hypervisors

(xv) Choose the role of a load balancer in a cloud environment.

a) To provide high-speed Internet connections
b) To direct service requests to available resources
c) To encrypt data during transmission
d) To create virtual hardware systems

Group-B

(Short Answer Type Questions) 3 x 5=15

2. What are the different types of load balancing techniques in cloud environments, and how they contribute to high availability? (3)
3. Describe RPC mechanism in distributed computing. (3)
4. Differentiate GFS and HDFS storage models that handle large data sets in cloud environments. (3)
5. Differentiate the vulnerabilities at various layers of cloud security (network, host, application). How these vulnerabilities are interrelated? (3)

6. Evaluate the trade-offs between using Infrastructure as a Service (IaaS) versus Platform as a Service (PaaS) for deploying enterprise applications. (3)

OR

Assess the limitations of Elastic Computing in comparison with traditional static resource allocation methods. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Develop the mechanism of dynamic horizontal scaling with appropriate diagram. (5)
8. Explain the mechanism of cloud bursting with diagram. (5)
9. Analyze the differences between IaaS, PaaS, and SaaS in terms of control and flexibility for organizations. (5)
10. Discuss how elastic computing helps organizations to manage varying workloads, and what challenges might arise while implementing elastic computing solutions? (5)
11. Discuss the key benefits and limitations of administering cloud services using a Remote Administration System. (5)
12. Evaluate the importance of storage virtualization in cloud infrastructure. What are its strengths and challenges? (5)

OR

Evaluate how Software-Defined Networking (SDN) complements network virtualization in cloud environments. What improvements does it bring? (5)

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