

**IM.Sc. AIML Sem.-8 Examination****CC-412****Cloud Computing****April-2025****Time : 2-30 Hours]****[Max. Marks : 70**

**Instructions:** All questions are compulsory. Use of non-programmable scientific calculator is allowed.

- Q.1**
- (a) Describe the architecture and working of a Distributed File System and its role in cloud computing. (07)
  - (b) Discuss the differences and similarities between Edge Computing and Fog Computing with real-world examples. (07)

**OR**

- (a) Explain the process and significance of data offloading in cloud and edge computing environments. (07)
- (b) How do Cloud-Based DevOps Tools facilitate CI/CD pipelines, and what are their benefits in software development? (07)

- Q.2**
- (a) How does the MapReduce framework work in handling large-scale data processing on cloud platforms? Provide an example. (07)
  - (b) Describe the implementation of Security Groups and Network Access Control Lists (NACLs) in cloud environments and their differences. (07)

**OR**

- (a) Explain how NoSQL databases are optimized for parallel query execution and their role in handling big data in the cloud. (07)
- (b) Discuss the major security challenges in cloud computing, including data loss, service hijacking, and shared technology issues. (07)

- Q.3**
- (a) How does Auto Scaling and Load Balancing improve the efficiency and scalability of cloud applications? Provide examples. (07)
  - (b) Discuss the steps involved in designing a Virtual Private Cloud (VPC) and its importance in cloud infrastructure. (07)

**OR**

- (a) Describe the role and functionality of a Cloud API Gateway in integrating cloud services. (07)
- (b) Compare and contrast the Min-Min, Max-Min, and MET scheduling algorithms with respect to task scheduling in the cloud. (07)

- Q.4**
- (a) Compare and contrast hypervisors and Docker containers in terms of architecture, performance, and resource utilization. (07)
  - (b) Describe the concept of virtualization and explain its role in enabling cloud computing. (07)

**OR**

- (a) Discuss the deployment models (Public, Private, Hybrid, Community) of cloud computing and their use cases. (07)

- (b) What are the major challenges of cloud computing? How can these challenges be mitigated? (07)

**Q.5** Attempt any **SEVEN** out of **TWELVE**: (14)

- (1) What is IaaS?
- (2) Briefly explain the need for Dockers and Containers in modern application development.
- (3) What is the importance of VM clustering, and how does it impact system availability?
- (4) What is an IP address?
- (5) List the advantages of using serverless computing over traditional cloud computing models.
- (6) What is the difference between time-shared and space-shared resource provisioning in cloud environments?
- (7) What is a Security Group in cloud computing?
- (8) What does a Network Access Control List (NACL) do in a VPC?
- (9) Name one example of a NoSQL database.
- (10) Name two ongoing research areas in edge and fog computing.
- (11) What are the advantages of data partitioning in distributed databases?
- (12) Define public cloud.

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