**University of Calcutta**
**M.Sc. Semester – IV (Mid-Semester) Examination, 2024**
**Paper Code & Name: CSM 401: Elective I (Distributed & Cloud Computing)**
**Full Marks: 30**

Date: 02 .05.2024

Time: 1 Hour

<u>**Please note the following instructions carefully:**</u>
**Promise not to commit any academic dishonesty.**
**Candidates are required to answer in their own words as far as applicable.**
**The figures in the margin indicate full marks.**
**Answer question number 1 and 2 below as mentioned.**

1.  Answer *any FIVE*                                          5 × 2 = 10
    a)  Define cloud computing.
    b)  Briefly explain the main service model of cloud computing.
    c)  What is resource pooling?
    d)  What is multi-cloud?
    e)  What are host and guest machines?
    f)  What is virtualization manager?
    g)  What is hybrid multi cloud?

2.  Answer *any FOUR*                                          5 × 4 = 20
    a.  Differentiate between public, private and commodity cloud.
    b.  Provide an in-depth technical description illustrating the reasons for virtual machines to be slower than physical machines.
    c.  What are aggregation, emulation, isolation characteristics of virtualization?
    d.  Explain the cloud computing service model with proper diagram.
    e.  Explain the type 1 virtualization with suitable diagram.
    f.  Mention and explain the characteristics of virtualization.
    g.  Explain the performance and optimization of cloud service speciality.

# 2024

## COMPUTER SCIENCE

### Paper : CSME-402

### (Distributed and Cloud Computing)

### Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer *question nos.* **1** and **2**, and *any four* from the rest.

1. Answer *any five* questions :  2×5

    (a) Name the characteristics of Amazon S3.

    (b) What are Availability Zones, and why are they important?

    (c) What are access and application virtualization?

    (d) Define vendor lock-in and explain its significance in cloud computing.

    (e) What is meant by multi-tenancy in cloud computing?

    (f) Mention the characteristics of the multi-cloud system.

    (g) What is meant by measured service and on-demand self-service?

2. Answer *any five* questions :  4×5

    (a) Compare and contrast the features of Amazon S3 and Amazon EBS. Discuss the significance of Lifecycle Management in Amazon S3.

    (b) What role does IAM play in AWS security? How does it differ from AMI in AWS?

    (c) What is containerization, and how do containers address the limitations of traditional virtual machines in terms of resource utilization?

    (d) Compare and contrast hosted virtualization with bare metal virtualization.

    (e) Compare and contrast the four primary cloud deployment models : public, private, community, and hybrid clouds.

    (f) How do different service models (IaaS, PaaS, SaaS) cater to varying business needs?

    (g) What is Cloud Ecosystem? Explain some of the service specialities of cloud computing.

**Please Turn Over**

3. (a) Explain the concept of object storage as implemented in Amazon S3.

   (b) How does Cross Region Replication work in Amazon S3?

   (c) What is the pricing model of Amazon S3?                                    4+4+2

4. (a) Why do customers prefer Amazon EC2?

   (b) Explain the step-by-step process to set up EC2 instances in AWS and mention the working principle of EC2 Service in AWS.                                       3+7

5. (a) Compare and contrast containers and hypervisors.

   (b) Explain the role and components of Docker in containerization.

   (c) Describe the concept of Kubernetes and its key components.                 3+4+3

6. (a) Explain the characteristics of virtualization.

   (b) What is Hyper-V? Explain the working principle of the Hyper-V system with a suitable diagram.
                                                                                  3+7

7. (a) Mention different types of virtualization.

   (b) What is CPU virtualization?

   (c) Compare and contrast storage, memory and data virtualization.             2+2+6

8. (a) How is data protection achieved in Amazon S3?

   (b) How is Amazon S3 different from Amazon RDS, EBS and EFS?

   (c) Write short note on DynamoDB.                                             3+3+4

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