(T) Roll No. .....

PAPER ID—11298

B. Tech. EXAMINATION, 2025

(Fifth Semester)

Open Elective Course—I

CLOUD COMPUTING

Time : 3 *Hours* *Maximum Marks* : 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) State any *two* essential characteristics of cloud computing.

   (b) Explain any *two* cloud vulnerabilities.

   (c) Why is concurrency important in distributed systems ? Explain with example.

   (d) Define a parallel system. How is it different from a distributed system ?

   (e) What do you mean by responsibility sharing between the user and cloud service provider ? State one responsibility of each side.

   (f) What is meant by a public cloud ? Give one example.

   (g) Differentiate between SaaS and PaaS. Two points. **7×2=14**

Unit I

2. (a) Discuss in detail cloud computing delivery models and services. Explain, how cloud computing provides scalability and elasticity to users and organizations ? 7

   (b) Explain cloud vulnerabilities in detail. Discuss any *four* security threats that affect cloud computing and briefly suggest mitigation strategies for each. 7

3. (a) Explain in detail the key components of cloud computing model and their working using suitable flow diagram. 7

(b) "Cloud computing has important ethical, legal and social implications." Discuss. 7

Unit II

4. (a) Define a distributed system. Explain its key characteristics, advantages and challenges. Give examples of distributed systems used in real-world applications. 7

(b) Explain the concept of atomic actions with examples. How does atomicity helps in maintaining system consistency and correctness in a distributed system ? 7

5. (a) Describe Lamport's logical clock algorithm. How it assigns timestamps to events and ensures partial ordering of events in distributed systems ? 7

(b) How Petri Nets are used to model concurrency in distributed systems ? How they help detect deadlocks, conflicts, or synchronization problems ? 7

Unit III

6. (a) Explain cloud virtualization and its significance. Discuss the types of virtualization, their characteristics, advantages and disadvantages. 7

(b) Describe, how cloud platforms manage different resources. Explain common techniques used for efficient resource utilization, scalability and performance. 7

7. (a) Describe the architecture of Microsoft Azure and its online services. Explain how it provides virtualized cloud resources to users. 7

(b) How layering in cloud infrastructure facilitates interoperability between different cloud services ? Discuss, how each layer contributes to service abstraction and flexibility ? 7

Unit IV

8. (a) What is service abstraction in cloud platforms ? Explain its advantages with suitable examples. 7

(b) Explain the SPI model (Software, Platform, Infrastructure) in detail. Discuss the roles of each layer. 7

9. Describe the following :

(a) Open Cloud Services 7

(b) Traditional System *vs*. Cloud System Model 7

❖❖❖❖❖❖❖