



# Faculty of Engineering

## End Semester Examination May 2025

### IT3CO35 Distributed & Cloud Computing

<b>Programme</b>	<b>:</b>	<b>B.Tech.</b>	<b>Branch/Specialisation</b>	<b>:</b>	<b>IT</b>
<b>Duration</b>	<b>:</b>	<b>3 hours</b>	<b>Maximum Marks</b>	<b>:</b>	<b>60</b>

**Note:** All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Section 1 (Answer all question(s))					Marks	CO	BL
<b>Q1.</b>	What is the full form of DCE in distributed computing?				1	1	1
	<input checked="" type="radio"/> Distributed Computing Environment <input type="radio"/> Dynamic Communication Engine	<input type="radio"/> Decentralized Cloud Environment <input type="radio"/> Distributed Control Entity					
<b>Q2.</b>	Which of the following is a deployment model in cloud computing?				1	1	1
	<input type="radio"/> Intrusive deployment <input checked="" type="radio"/> Public cloud	<input type="radio"/> Limited deployment <input type="radio"/> On-premises only					
<b>Q3.</b>	Which of the following is a benefit of virtualization?				1	2	1
	<input type="radio"/> Lower hardware utilization <input checked="" type="radio"/> Enhanced resource management	<input type="radio"/> Higher energy consumption <input type="radio"/> Limited scalability					
<b>Q4.</b>	Which of the following best describes Remote Procedure Call (RPC)?				1	2	1
	<input type="radio"/> A method for executing procedures on a local machine <input type="radio"/> A technique for sharing memory across distributed systems	<input checked="" type="radio"/> A protocol for communication between distributed objects <input type="radio"/> A mechanism for protecting processes in an operating system					
<b>Q5.</b>	Which of the following is a feature of Lamport timestamps?				1	3	1
	<input type="radio"/> They provide physical time synchronization <input type="radio"/> They guarantee mutual exclusion in distributed systems	<input type="radio"/> They ensure global clock consistency <input checked="" type="radio"/> They establish a partial ordering of events					
<b>Q6.</b>	In distributed systems, what is the full form of PaaS?				1	3	1
	<input type="radio"/> Platform as a Server <input checked="" type="radio"/> Platform as a Service	<input type="radio"/> Programming as a Service <input type="radio"/> Program as a Server					
<b>Q7.</b>	What is the role of a naming system in a distributed file system?				1	4	1
	<input type="radio"/> To structure files within directories <input checked="" type="radio"/> To link logical file names to their physical locations	<input type="radio"/> To allocate unique identifiers to files <input type="radio"/> To ensure file data encryption					
<b>Q8.</b>	Which cloud security aspect is responsible for identifying and evaluating security vulnerabilities?				1	4	1
	<input checked="" type="radio"/> Vulnerability assessment <input type="radio"/> Identity management	<input type="radio"/> Security architecture <input type="radio"/> Access control					
<b>Q9.</b>	Which of the following is not classified as a load-distributing algorithm?				1	5	1
	<input type="radio"/> Round-robin <input type="radio"/> Least connections	<input type="radio"/> Random selection <input checked="" type="radio"/> Centralized scheduling					

**Q10.** Which cloud application development platform uses the Xen hypervisor?

1 5 1

- ☐ AWS (Amazon Web Services)
 ☐ Google App Engine  
☒ OpenStack
 ☐ Microsoft Azure

**Section 2 (Answer all question(s))**

Marks CO BL

**Q11.** Describe the concept of edge computing and its significance in contemporary distributed systems.

2 1 2

Rubric	Marks
Describe Edge computing. 1 mark	2
Significance of edge computing 1 mark	

**Q12.** Explain the progression of DCE and its influence on the advancement of distributed computing.

3 1 2

Rubric	Marks
Explain DCE 1.5 mark	3
Impact of DCE 1.5 mark	

**Q13. (a)** Explain the significance of virtualization in cloud computing. How it influences resource management and scalability?

5 1 2

Rubric	Marks
Significance of virtualization 2 mark	5
Its influences on resource management and scalability 3 marks	

(OR)

**(b)** Explain the different cloud computing deployment models, including public, private, hybrid, and community clouds.

Rubric	Marks
Deployment model 1 mark	5
Public model 1 mark	
private model 1 mark	
Hybrid model 1 mark	
Community model 1 mark	

**Section 3 (Answer all question(s))**

Marks CO BL

**Q14.** What is the difference between full virtualization and para-virtualization?

Rubric
--------

**Marks**

full virtualization 1 mark  
para-virtualization 1 mark

**Q15.** List three benefits of virtualization in distributed systems.

3 2 2

Rubric	Marks
First benefit. 1 mark Second benefit: 1 mark Third benefit. 1 mark	3

**Q16. (a)** Define Distributed Shared Memory (DSM) and explain how it enables shared memory access across distributed nodes.

5 2 2

Rubric	Marks
Define DSM 2 marks how DSM enables shared memory access (3 marks)	5

(OR)

**(b)** What is a Remote Procedure Call (RPC)? How does it facilitate communication between processes in distributed systems?

Rubric	Marks
Define RPC. 2 marks How does it facilitate communication with diagrams? 3 marks	5

**Section 4 (Answer all question(s))**

**Marks CO BL**

**Q17.** What is the difference between logical time and physical time?

3 3 2

Rubric	Marks
First Difference: 1 mark Second Difference 1 mark Third Difference 1 mark	3

**Q18. (a)** How does Lamport's Logical Clock algorithm achieve ordering of events in a distributed environment?

7 3 2

Rubric	Marks
About lamport's algorithm 3 marks Event order diagram with time 4 marks	7

(OR)

**(b)** Define Software as a Service (SaaS) and outline its advantages for end-users and businesses.

Rubric	Marks
Define SaaS (3 marks). First Advantage: 1 mark Second Advantage 1 mark Third Advantage: 1 mark Fourth Advantage 1 mark	7

**Section 5 (Answer all question(s))**

**Marks CO BL**

**Q19.** What are the differences between file service architecture and traditional file systems?

4 4 2

Rubric	Marks
First Difference 1 mark Second Difference 1 mark Third Difference 1 mark Fourth Difference 1 mark	4

**Q20. (a)** Define vulnerability assessment and its role in cloud security.

6 4 1

Rubric	Marks
Vulnerability Assessment 3 marks Role in cloud security 3 marks	6

(OR)

**(b)** What is identity management? Why is it crucial for ensuring cloud security?

Rubric	Marks
About identity management 3 marks essential for cloud security 3 marks	6

### Section 6 (Answer any 2 question(s))

Marks CO BL

**Q21.** Describe the characteristics of static and dynamic load distributing algorithms.

5 5 2

Rubric	Marks
characteristics of static load distributing algorithms 2.5 marks characteristics of dynamic load-distributing algorithms. 2.5 marks	5

**Q22.** What are fault-tolerant services? Why are they important in distributed systems?

5 5 2

Rubric	Marks
Define fault-tolerant services. 2.5 marks their importance in distributed systems. 2.5 marks	5

**Q23.** Compare and differentiate Xen Hypervisor, AWS, Google App Engine, and OpenStack as cloud application development platforms.

5 5 3

Rubric	Marks
First Comparison 1 mark Second Comparison 1 mark Third Comparison: 1 mark Fourth Comparison: 1 mark Fifth Comparison: 1 mark	5

\*\*\*\*\*