

# Faculty of Engineering

## End Semester Examination May 2025

### IT3CO35 Distributed & Cloud Computing

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

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

<b>Section 1 (Answer all question(s))</b>				<b>Marks CO BL</b>
<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"/> Decentralized Cloud Environment		
<input type="radio"/> Dynamic Communication Engine		<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 type="radio"/> Limited deployment		
<input checked="" type="radio"/> Public cloud		<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 type="radio"/> Higher energy consumption		
<input checked="" type="radio"/> Enhanced resource management		<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 checked="" type="radio"/> A protocol for communication between distributed objects		
<input type="radio"/> A technique for sharing memory across distributed systems		<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 ensure global clock consistency		
<input type="radio"/> They guarantee mutual exclusion in distributed systems		<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 type="radio"/> Programming as a Service		
<input checked="" type="radio"/> Platform 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 type="radio"/> To allocate unique identifiers to files		
<input checked="" type="radio"/> To link logical file names to their physical locations		<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"/> Security architecture		
<input type="radio"/> Identity management		<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"/> Random selection		
<input type="radio"/> Least connections		<input checked="" type="radio"/> Centralized scheduling		

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

1 5 1

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

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

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

Marks CO BL  
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

<b>Rubric</b>	<b>Marks</b>
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

<b>Rubric</b>	<b>Marks</b>
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?

<b>Rubric</b>	<b>Marks</b>
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

<b>Rubric</b>	<b>Marks</b>
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

<b>Rubric</b>	<b>Marks</b>
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.

<b>Rubric</b>	<b>Marks</b>
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

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