GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (Second Semester) Regular Examinations, July – 2025

24MCSPE12002 - Distributed Systems

(CSE)

Time: 3 hrs Maximum: 60 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	What are the issues in distributed system?	CO1	K1
b.	What is meant by Marshalling and Unmarshalling of data?	CO2	K1
c.	What is the purpose of the server stub in RPC?	CO3	K1
d.	What is the need for clock synchronization in distributed systems?	CO4	K2
e.	What is the main purpose of grid computing?	CO5	K1

PART – B **(10 x 5 = 50 Marks)**

		Marks	CO #	Blooms Level
	Answer ***ALL*** the questions			
2. a.	Discuss various issues and challenges involved in the implementation of Distributed Systems.	5	CO1	K1
b.	Discuss in detail the major software challenges in designing and implementing a distributed system.	5	CO1	K1
	(OR)			
c.	Describe the characteristics of a distributed computing model. How do they contribute to system reliability and scalability?	5	CO1	K2
d.	Discuss how a client interacts with a server. What mechanisms are used to ensure security in this interaction?	5	CO1	K3
3.a.	With a neat sketch, Explain the implementation of Remote Method Invocation.	5	CO2	K2
b.	Describe how Remote Method Invocation (RMI) is implemented in Java. Explain the role of remote interfaces and discuss how parameters are passed in Java RMI with suitable examples.	5	CO2	K3
	(OR)			
c.	With a neat sketch, Explain the implementation of Remote Method Invocation.	5	CO2	K2
d.	What are stub and skeleton and why are they needed in remote procedure calls?	5	CO2	K2
4.a.	Why is clock synchronization being important in distributed systems? Discuss the consequences of unsynchronized clocks with suitable examples.	5	CO3	K2
b.	What is the need for an election algorithm in distributed systems? Explain the Bully Algorithm or Ring Algorithm with a suitable example.	5	CO3	K3
	(OR)			
c.	Differentiate between logical clocks and physical clocks. How do logical clocks (e.g., Lamport Timestamps) help in ordering events in a distributed system?	5	CO3	K3
d.	Describe the working of the Berkeley Algorithm for clock synchronization.	5	CO3	K3

5.a.	What is Distributed Shared Memory (DSM)? Explain its key goals and highlight the major advantages it offers in a distributed computing environment.	5	CO4	K2
b.	Describe the architecture and major components of a distributed file system. How are file access, naming, caching, and consistency managed in such a system?	5	CO4	K2
	(OR)			
c.	Explain the differences between a Distributed File System (DFS) and a Distributed Database System (DDBS), focusing on their architecture, core functionalities, data management strategies, and typical application scenarios.	5	CO4	K3
d.	How do distributed database systems ensure fault tolerance? Explain the roles of replication, recovery mechanisms, and backup strategies in maintaining system reliability.	5	CO4	K3
6.a.	Define emerging trends in information technology. Discuss the significance of tracking emerging trends and give examples of current technologies shaping the future of computing.	5	CO5	K2
b.	Define Cloud Computing. Explain its essential characteristics, service models (IaaS, PaaS, SaaS), and deployment models (Public, Private, Hybrid, Community).	5	CO5	K2
	(OR)			
c.	What is Service-Oriented Architecture (SOA)? Discuss its key principles and components with a suitable diagram.	5	CO5	K3
d.	Discuss the lifecycle of a service in SOA. Explain how services are discovered, bound, and invoked in a service-oriented system.	5	CO5	K3

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