

FACULTY OF ENGINEERING

B.E. (CSE) VII - Semester (AICTE) (Main & Backlog) (New) Examination, February/ March 2025

Subject: Distributed Systems

Max. Marks: 70

Time: 3 Hours

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) Differentiate between centralized and decentralized architectures in system design.
b) What is the role of virtualization in distributed systems?
c) Define the term "replica management" and its significance.
d) What are the key components of the CORBA architecture?
e) Define the role of web proxy caching in web-based distributed systems.
f) What is the significance of security in distributed coordination-based systems?
g) What are the key characteristics of a distributed file system (DFS)?
2. a) Describe message-oriented communication in distributed systems and explain how transient and persistent communication models work.
b) Explain remote procedure call (RPC) in detail, including basic operations, parameter passing, and asynchronous RPC mechanisms.
3. a) What are data-centric consistency models in distributed systems, and how do they work?
b) What is the Berkeley Algorithm for clock synchronization, and how does it work in distributed systems?
4. a) Describe the security challenges in distributed object-based systems.
b) Explain the key design issues in achieving process resilience. How does failure detection play a role in maintaining fault tolerance?
5. a) Explain the design goals and challenges of a distributed file system.
b) What are web services, and why are they essential in distributed computing?
6. a) Explain Grid Computing and its significance in modern computing environments.
b) Discuss Service-Oriented Architecture (SOA) and its key features.
7. a) Define web services and explain their types in detail.
b) What is the Apache Web Server? Discuss its features and functionalities.