

Total No. of Questions : 12]

SEAT No. :

**P1789**

[4859]-191

[Total No. of Pages : 3

**B.E. (Information Technology)  
DISTRIBUTED SYSTEM  
(2008 Course) (Semester-II)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 from Section-I and Q. 7 or Q. 8, Q. 9 or Q. 10, Q. 11 or Q. 12 from Section-II.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right side indicate full marks.*
- 5) *Use of calculator is allowed.*
- 6) *Assume suitable data, if necessary.*

**SECTION-I**

**Q1) a)** What are the design challenges in design of Distributed Systems? [8]

b) What is a middleware? Specify its need with examples of middlewares. [8]

OR

**Q2) a)** Explain following with respect to Distributed System: [8]

- i) Layered Architecture.
- ii) Object-based Architecture.
- iii) Data-centered Architecture.
- iv) Event-based Architecture.

b) What is heterogeneity? How to handle it in distributed systems. [8]

**Q3) a)** What is a Remote Method Invocation? How would you incorporate persistent asynchronous communication into model of communication based on RMI's to remote object? [10]

b) What is marshalling and unmarshalling? How it is used in communication between a client and a server? [8]

OR

*P.T.O.*

**Q4) a)** What is LRPC? Describe the four techniques used in a LRPC system that makes more efficient than a conventional RPC system. [10]

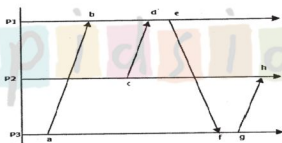
b) What are the challenges in designing and developing a multimedia streaming application. Describe in the context of Synchronization and coordination. [8]

**Q5) a)** Why real computer clocks are not useful in distributed systems. A clock of a computer system must never run backward. Explain how this issue can be handled in an implementation. [8]

b) Compare Centralized, Decentralized, Distributed and Token ring mutual exclusion algorithms. [8]

OR

**Q6) a)** Solve following timing diagram using Lamport's Logical Clock algorithm and Vector Time-stamp method both. [10]



b) What are the features of Network Time Protocol? Explain how NTP is useful to distributed time over the Internet? [6]

### SECTION-II

**Q7) a)** What is automounter facility in NFS? How does the NFS Automounter help to improve the performance and scalability of NFS? [8]

b) Describe file sharing mechanism in CODA file system. [8]

OR

- Q8) a)** Explain following term with respect to Naming entities: [8]
- i) Names.
  - ii) Identifiers.
  - iii) Addresses.
  - iv) Name Spaces.
- b) Discuss security implementations in Network File System. [8]

- Q9) a)** What is Distributed Shared memory? What are the design issues in implementation of DSM? [8]
- b) What is Client centric consistency model? Explain in detail. [8]

OR

- Q10) a)** Explain PRAM consistency model and Weak Consistency model in detail. [8]
- b) What is the data centric consistency model? Explain in detail. [8]

- Q11) a)** What is the Byzantine general problem? If there are 'n' components, then what is the minimum requirement to take a decision in the presence of faulty components? [8]

- b) Explain following protocols: [10]
- i) One-Phase Commit.
  - ii) Two-Phase Commit.
  - iii) Three-Phase Commit.

OR

- Q12) a)** What is fault tolerance? How it increases reliability. [8]
- b) Explain why a multi-threaded server might not qualify as a state machine. [10]

