

(3 Hours)**[Total Marks: 80]**

- N.B.: (1) **Question No. 1 is compulsory.**
 (2) Attempt **any three** out of remaining five questions.

- Q.1 (a) Discuss the issues involved in designing a Distributed Operating System. 10
 (b) What is Cloud Computing? What are the service models of Cloud Computing? 10
 Explain in brief.
- Q.2 (a) Explain concept of logical clock & their importance in distributed system. A clock 10
 should never run backwards. How can this be implemented? How is this issue handled
 in implementation of logical clocks?
 (b) What do you mean by Idempotency? How can you implement exactly once semantics 10
 in message passing system?
- Q.3 (a) What are threads? What advantage they have over processes? Compare 10
 implementation of threads package at user level and kernel level.
 (b) What is light weight RPC? Explain in detail. 10
- Q.4 (a) Differentiate between stateful & stateless servers. Which servers are better for fault 10
 recovery and why?
 (b) What are election algorithms? Explain bully algorithm in detail with diagram. Is it 10
 more efficient than ring algorithm?
- Q.5 (a) What is sequential consistency? How is data locating mechanism handled in replicated 10
 migrating blocks and non-replicated migrating blocks?
 (b) What is parallel computing? Explain with example task and data parallelism. 10
- Q.6 Write short notes on - 20
 (a) CORBA
 (b) SOA
 (c) Grid computing
 (d) Identity and access management
