Reg. No. : ....

Name : ....

Eighth Semester B.Tech. Degree Examination, April 2016
(Computer Science & Engg.)
(2008 Scheme)
08.804 : DISTRIBUTED SYSTEMS (R)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **four** marks.

1. How are distributed systems better than centralized systems ? Give examples of three applications for which distributed systems will be more suitable.

2. What are the networking issues for distributed system ?

3. Describe possible occurrences of the main types of security threat that might occur in the Internet.

4. Differentiate between peer to peer and client server models of distributed systems.

5. Discuss the general characteristics of interprocess communication.

6. Write short notes on parameter passing in RPC.

7. What are digital signatures ? Discuss the methods for generating signatures.

8. What are the advantages and drawbacks of multiversion timestamp ordering in comparison with ordinary timestamp ordering ?

9. Explain why allowing backups to process *read* operations leads to sequentially consistent rather than linearizable executions in a passive replication system.

10. How is backward validation of transaction done ?   **(10×4=40 Marks)**

PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

Module – I

11. a) What aspects do the failure models of a distributed systems deals with ? Consider two communication services for use in asynchronous distributed systems. In service A, messages may be lost, duplicated or delayed and checksums apply only to headers. In service B, messages may be lost, delayed or delivered too fast for the recipient to handle them, but those that are delivered arrive with the correct contents. Describe the classes of failures exhibited by each service.   12

   b) Discuss briefly key challenges that one needs to address in the design and development of distributed systems.   8

OR

12. a) Describe the main types of network that are used to support distributed systems.   10

   b) The Internet is far too large for any router to hold routing information for all destinations. How does the Internet routing scheme deals with this issue ?   10

Module – II

13. a) Explain how communication is done between Distributed Objects.   10

   b) What is marshaling ? List out the different approaches of external data representation and discuss each approach in detail.   10

OR

14. a) Describe some of the ways in which conventional email is vulnerable to eaves dropping, masquerading, tampering, replay and denial of service attacks. Suggest methods by which email could be protected against each of these forms of attack.   12

   b) Explain why and how a client is prevented from calling arbitrary code within a server under lightweight RPC.   8

Module – III

15. a) Explain the difference between linearizability and sequential consistency, and why the latter is more practical to implement, in general.   10

    b) What is meant by nested transactions ? Explain how the two-phase commit protocol for nested transactions ensures that if the top-level transaction commits, all the right descendants are committed or aborted.   10

                                OR

16. a) Describe how distributed deadlocks are detected using the edge-chasing algorithm. Give examples to show that it could detect phantom deadlocks.   12

    b) Describe how a non-recoverable situation could arise if write locks are released after the last operation of a transaction but its commitment.   8

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