B. Tech.
(SEM-VII) THEORY EXAMINATION 2017-18
Distributed System

Time: 3 Hours   *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
      2. Any special paper specific instruction.

SECTION A

1.   **Attempt all questions in brief.**   **(2*10=20)**

(a) Why does a logical clock need to be implemented in Distributed Systems?
(b) Explain the requirements of good mutual exclusion algorithm?
(c) What is Forward Validation?
(d) Discuss silent features of mounting process?
(e) Define local and global checkpoints.
(f) What are authenticated and non-authenticated messages?
(g) Explain event ordering.
(h) What do you mean by Global state of Distributed System?
(i) What are commit protocol?
(j) What are the challenges in designing distributed shared memory?

Section-B

2. Attempt any three questions of the following.   **(10*3=30)**

a. Why is scalability an important feature in the distributed system? Discuss some of the guiding principles for designing a scalable distributed system.
b. What is the need of termination detection algorithms in a distributed system? Explain Huang's termination detection algorithm.
c. Explain how two phase commit protocol for nested transaction ensures that if the top level transaction commits all the right descendents are committed or aborted.
d. Describe Majority Based Dynamic Voting protocol with example.
e. Show the Byzantine agreement cannot always be reached among four processors if two processors are faculty.

Section-C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Why is computer clock synchronization necessary? Describe the design requirement for a system to synchronize the clocks in a distributed system?
(b) What do you mean by causal ordering of message? Discuss the salient features of broadcast based protocol that make the uses of vector clock which ensures causal ordering of messages.

4. Attempt any *one* part of the following: **10 x 1 = 10**

(a) Explain the differences in centralized, distributed and hierarchical control organization for distributed deadlock detection?

(b) What are the Token and Non token based algorithm? Explain Lamport's algorithm with example.

5. Attempt any *one* part of the following: **10 x 1 = 10**
  (a) What are agreement protocols? What are agreement and validity objectives of byzantine agreement problems?
  (b) What is caching? How it is useful in Distributed File System..

6. Attempt any *one* part of the following: **10 x 1 = 10**
  (a) Discuss Orphan messages and Domino effect with example.
  (b) What do you understand by distributed file system in distributed system? Discuss the Architecture of SUN Network file system.

7. Attempt any *one* part of the following: **10 x 1 = 10**
  (a) What is timestamp ordering? Explain advantages and drawbacks of multiversion timestamp ordering.
  (b) Explain how a non recoverable situation could arise if write locks are released after the last operation of a transaction but before its commitment.