

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2012269

Roll No.

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## B.TECH

### Regular Theory Examination (Odd Sem - VII), 2016-17 DISTRIBUTED SYSTEM

Time : 3 Hours

Max. Marks : 100

#### Section - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)
- List out the main challenges of distributed systems.
  - What are logical clocks? Why does a logical clock need to be implemented in distributed systems?
  - What do you mean by mutual exclusion in distributed system? What are the requirements of a good mutual exclusion algorithm?
  - Define deadlock detection in distributed systems.
  - List out some issues in distributed file system.
  - State Byzantine agreement problem.
  - What do you mean by agreement protocol?
  - Compare and contrast static and dynamic vote protocols.

- i) Define fault and failure. What are different approaches to fault-tolerance?
- j) What are the different validation conditions for optimistic concurrency control?

### Section - B

**Note:** Attempt any five questions from this section  
(5×10=50)

- 2. i) Discuss the limitations of Lamport's logical clock with suitable example.
- ii) Give the Chandy-Lamport's global state recording algorithm.
- 3. Discuss casual ordering of messages. Give one algorithm which can order the messages according to causal dependencies.
- 4. i) Differentiate between token and non token based algorithms.
- ii) What are the deadlock handling strategies in distributed file systems? What is control organization for distributed deadlock detection? Discuss an algorithm which can remove phantom deadlock.
- 5. What are agreement protocols? Explain Byzantine agreement problem, the consensus problem and interactive consistency problem.
- 6. Describe in detail:
  - a) Dynamic voting protocols.
  - b) Method to obtain consistent set of checkpoint.

- 7. Define forward recovery and backward recovery. List advantages and disadvantages of forward recovery. Explain two approaches of backward-error recovery.
- 8. Explain design in use in distributed shared memory and also write algorithm for implementation of shared memory.
- 9. i) What are the goals of distributed transaction? Distinguish between flat and nested transaction along with its structure.
- ii) Explain optimistic concurrency control.

### Section - C

**Note:** Attempt any two questions from this section.  
(2×15=30)

- 10. Describe Lamport - shostak - pease algorithm. How does vector clock overcome the disadvantages of Lamport clock? Explain with an example.
- 11. Discuss the following:
  - a) Performance metric for distributed mutual exclusion algorithms.
  - b) Obermarck's Path - Pushing algorithm.
- 12. Write short notes on:
  - a) Flat and nested transaction
  - b) 2PL and Strict 2PL.

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