Printed Pages: 3

NCS - 701

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

Paper ID : 2012269 Roll No.

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)

a) List out the main challenges of distributed systems.

b) What are logical clocks? Why does a logical clock need to be implemented in distributed systems?

c) What do you mean by mutual exclusion in distributed system? What are the requirements of a good mutual exclusion algorithm?

d) Define deadlock detection in distributed systems.

e) List out some issues in distributed file system.

f) State Byzantine agreement problem.

g) What do you mean by agreement protocol?

h) 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.