

UG GATE VIII
16/5/13 II

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

PAPER ID : 2715

Roll No.

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B.Tech.

(SEM. VIII) EVEN THEORY EXAMINATION 2012-13

DISTRIBUTED SYSTEMS

Time : 3 Hours

Total Marks : 100

1. Attempt any two questions : (10×2=20)
 - (a) What are the inherent limitations of distributed system ?
What could be the impact of absence of global clock and shared memory ?
 - (b) Define global state and consistent global state. Give the Chandy-Lamport's global state recording algorithm.
 - (c) Discuss following with suitable example :
 - (i) Causal order
 - (ii) Total order.
2. Attempt any two questions : (10×2=20)
 - (a) With reference to the token based algorithm, explain how Raymond tree based algorithm works ?
 - (b) Show that in Ricart-Agrawala algorithm the critical section is accessed according to increasing order of timestamps.
Does the same hold true in Maekawa's algorithm ?

(c) Suppose all the processes in the system are assigned priorities that can be used to totally order the processes. Modify edge chasing algorithm so that when a process detects a deadlock, it also knows the lowest priority deadlock process.

3. Attempt any two questions : (10×2=20)

(a) Discuss the Oral Message algorithm OM(m), where $m > 0$. With the help of suitable example show that it solves the Byzantine agreement problem for $3m + 1$ or more processors in the presence of at most m faulty processors.

(b) In the context of distributed file system explain following :

(i) Mounting

(ii) Caching

(iii) Bulk Data transfer.

(c) Explain the read replication and full replication algorithm for implementing distributed shared memory.

4. Attempt any two questions : (10×2=20)

(a) Describe any checkpointing and recovery algorithm that takes a consistent set of checkpoints and avoids livelock problems.

(b) Discuss the majority based dynamic voting protocol.

(c) Discuss following with suitable example :

(i) Consistent set of checkpoints and Strongly consistent set of checkpoints.

(ii) Orphan messages and Lost messages.

5. Attempt any two questions : (10×2=20)

- (a) Describe two-phase commit protocol. Give the state transition diagram of this protocol. What are the demerits of this protocol?
- (b) Discuss the optimistic methods for distributed concurrency control. What are the different validations conditions for optimistic concurrency control? Explain it.
- (c) Write short notes on any one of the following :
 - (i) Flat and Nested transaction
 - (ii) 2PL and strict 2PL.