

Name :
Roll No. :
Invigilator's Signature :

CS/B.TECH(IT)/SEM-7/IT-703D/2011-12
2011
DISTRIBUTED COMPUTING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

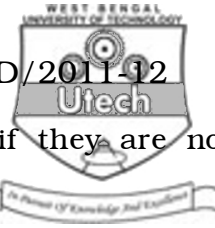
10 × 1 = 10

- i) Processes in distributed system normally communicate by using
 - a) Shared data approach
 - b) Message-Passing approach
 - c) Both of these
 - d) None of these.

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- ii) Cross-domain is associated with
- a) RPC
 - b) LRPC
 - c) WRPC
 - d) none of these.
- iii) What is used to detect deadlock in distributed system ?
- a) Chandy-Misra-Hass algorithm
 - b) Active Time Server Algorithm
 - c) Ring Algorithm
 - d) Lamport Algorithm.
- iv) Two events are said to be if they are not related by the happened before relation.
- a) transitive
 - b) concurrent
 - c) causal
 - d) none of these.
- v) Light weight RPC is made for
- a) cross-domain communication
 - b) cross-machine communication
 - c) both (a) and (b)
 - d) none of these.



vi) Two events are said to be if they are not related by the happened before relation.

- a) Concurrent b) Causal
- c) Transitive d) Parallel.

vii) Non-blocking synchronization is implemented by using the technique

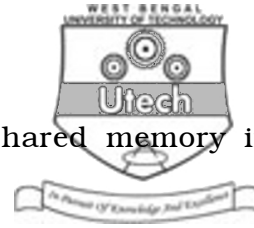
- a) polling b) interrupt
- c) both (a) and (b) d) none of these.

viii) Process migration is advantageous because

- a) it reduces average response time
- b) utilizes resource effectively
- c) reduces network traffic
- d) all of these.

ix) UTC stands for

- a) Universal Time for Communication
- b) Coordinal Universal Time
- c) Unique Time for Communication
- d) None of these.



- x) Granularity refers to distributed shared memory in terms of
- a) block size
 - b) page size
 - c) virtual address space
 - d) logical address space.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What are the four necessary conditions for a deadlock to occur ? 2
b) Prove that the presence of a cycle in a general resource allocation graph is a necessary but not a sufficient condition for the existence of deadlock. 3
3. What are the advantages and disadvantages of using the concept of Lamport's logical clock ?
4. a) What do you mean by Thrashing ? 2
b) Explain the relationship between thrashing and granularity. 3
5. a) Briefly describe symmetric and asymmetric key cryptography. $2 \frac{1}{2}$
b) Briefly describe Zero capacity buffer and bounded capacity buffer in message passing system. $2 \frac{1}{2}$
6. Describe the token passing approach of achieving mutual exclusion.



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What are the main differences between a network operating system and a distributed operating system ? 5
- b) What do you understand by transparency with reference to distributed systems ? Explain briefly the different types of transparencies. 5
- c) What are the different degrees of reliability in multicast communication ? Explain with an example of an application for each type. 5
8. a) Explain what is meant by absolute ordering, consistent ordering and causal ordering of messages. Give a mechanism to implement each one. 9
- b) What is "thrashing" ? Give some methods to solve the thrashing problem in distributed shared memory systems. 4
- c) What are multidatagram messages ? 2



9. a) Describe blocking and non-blocking types of IPC. 3
- b) What are the relative advantages and disadvantages of blocking and non-blocking IPC ? 3
- c) What do you mean by LWRPC ? 2
- d) What is masquerading. 2
- e) Describe some techniques used in LWRPC system that makes it more efficient than the conventional RPC system. 5
10. a) Name the main components of a distributed file system. What might be the reasons for separating the various functions of a distributed file system into these components ? 1 + 3
- b) "In the design of a distributed file system, high availability and high scalability are mutually related properties." Discuss. 3
- c) "In the design of a distributed file system, high performance and high reliability are mutually related properties." Discuss. 3
- d) What is an immutable file ? Can a file system be designed to function correctly by using only immutable files ? Explain. 2 + 3



11. a) What is name server ? Differentiate between system oriented and human oriented names. 2 + 3
- b) What is drifting of clocks ? What is clock skew ? 3 + 2
- c) In case of centralized clock synchronization algorithms, what is the difference between active time server and passive time server algorithms ? 5
12. a) What is Name Space ? Differentiate between Flat Name Space and Partitioned Name Space. What are the tasks of a Name Server ? 8
- b) What are the desirable features of a distributed file system ? What are the differences between replication and caching ? 7

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