

Total No. of Questions : 8 ] [ Total No. of Printed Pages : 3

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**MCIT-202**

**M. Tech. (Second Semester)  
EXAMINATION, August, 2008**

**(Information Technology)**

**DISTRIBUTED COMPUTING**

**(MCIT - 202)**

*Time : Three Hours*

*Maximum Marks : 100*

*Minimum Pass Marks : 40*

**Note :** Attempt any *five* questions. All questions carry equal marks.

1. (a) In a client-server model in a distributed system is it possible that : 10
  - (i) more than one client may invoke a server ?
  - (ii) one server may invoke another server for some purpose ?
- (b) How might the Kernel of a distributed OS differ from the kernel of a centralized OS ? Why might you wish to 'migrate' a process ? 10
2. (a) Consider the CBCAST protocol of casual ordering of message. There are four processes of *a*, *b*, *c* and *d*. The status of their vectors at an instance of time is *a* (3, 2, 4, 1), *b* (3, 2, 4, 1), *c* (2, 2, 4, 1) and (3, 2, 3, 1).

Determine what happens if process  $a$  tries to send a message to processes  $b$ ,  $c$  and  $d$  ? 10

- (b) Discuss Remote Procedure Call (RPC) in brief. What are the main similarities and differences between RPC model and the ordinary procedure call model ? 10
3. (a) Differentiate between stateful and stateless servers. Why do some distributed applications use stateless server inspite of stateful servers ? 10
- (b) The network time protocol (NTP) is an internet standard for synchronizing computer clocks. 10
- (i) Describe NTP's technique for measuring the delay and offset between two computers that communicate via message passing.
- (ii) Why this technique may not be reliable if for a particular pair of communicating computers the message propagation delay tends to be linear in one direction than the other ?
4. (a) Suppose that there are four active processes  $P_1$ ,  $P_2$ ,  $P_3$  and  $P_4$  at the moment, later  $P_1$  and  $P_4$  fails. Explain the various steps which will be taken by Bully's algorithm. 10
- (b) What is an immutable file ? Can a file system be designed to function correctly by using only immutable files ? If yes, how the basic file operations can be performed in this file system ? 10
5. (a) Why do some distributed systems use two-level naming ? Why can file caches use  $LR_4$  whereas virtual memory paging algorithms cannot, discuss ? 10
- (b) Explain the terms acquire of a lock and release of lock in a distributed shared memory system are the read

and write operations related to acquiring and releasing of the locks ? If yes, explain how. If no, give reasons. 10

6. (a) Why are election algorithm normally needed in a distributed system ? A LAN based distributed system has broadcast facility. Suggest a simple election algorithm for use in this system. 10
- (b) Is it possible that local wait for graph does not have a deadlock but global wait for graph can have a deadlock ? Give reasons to support your answer. 10
7. (a) Explain DCE with example. 10
- (b) Why does MACH provide Port sets, when it also provides threads ? 10
8. Write short notes on the following :
- (i) Directory services' 6
- (ii) Cryptographic algorithms in distributed computing 8
- (iii) Object based distributed shared memory 6