



Name : .....  
Roll No. : .....  
Invigilator's Signature : .....

**CS/B.TECH(CSE)/SEP.SUPPLE/SEM-7/CS-704D/2012**

**2012**

**ADVANCED OPERATING SYSTEM**

Time Allotted : 3 Hours

Full Marks : 70

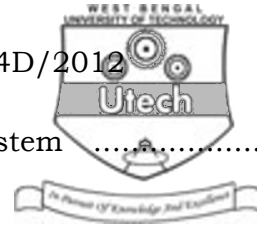
*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

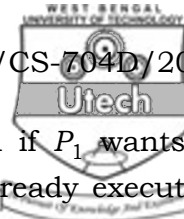
**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :  $10 \times 1 = 10$ 
  - i) Which one is not a distributed system ?
    - a) V-system
    - b) Amoeba
    - c) The Sprite system
    - d) None of these.
  - ii) Minimum ..... number(s) of processes can create deadlock.
    - a) four
    - b) three
    - c) two
    - d) one.
  - iii) Fruitless migration of processes is known as
    - a) process thrashing
    - b) load-balancing
    - c) load sharing
    - d) process scheduling.
  - iv) What-for is used for
    - a) deadlock detection
    - b) deadlock prevention
    - c) deadlock avoidance
    - d) deadlock recovery.



- v) For designing distributed file system .....  
transparencies are required.
- a) assess transparency
  - b) naming transparency
  - c) replication transparency
  - d) all of these.
- vi) Granularity of a Distributed Shared Memory (DSM) system refers to the
- a) block size of the DSM
  - b) total size of the DSM
  - c) block size of the process
  - d) none of these.
- vii) A thread shares with other threads belonging to the same process are
- a) code section and data section
  - b) other operating system resources
  - c) both (a) and (b)
  - d) none of these.
- viii) Critical region is
- a) a code segment of a program that needs exclusive access to shared resources
  - b) a high level synchronization construct
  - c) a region of a program which is shared among other cooperative processes
  - d) a region or portion of operating system used for handling critical situations.



- ix) According to Ricart-Agrawala algorithm if  $P_1$  wants to execute the critical section and  $P_2$  is already executing in the critical section, then  $P_2$  will reply to the request of  $P_1$
- a) if always
  - b) if timestamp of  $P_1 < P_2$
  - c) if timestamp of  $P_1 > P_2$
  - d) when  $P_2$  has finished.
- x) Which of the following is not a program threat ?
- a) Worms
  - b) Virus
  - c) Trojan horse
  - d) None of these.

**GROUP - B**

**( Short Answer Type Questions )**

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

- 2. Discuss the difference between network operating system and distributed operating system.
- 3. Briefly explain the different kinds of transparency properties desirable in a distributed system.
- 4. What is critical section problem and how is it solved by monitor ?  $2 + 3$
- 5. What are the advantages of user level thread and kernel level thread ?  $2 \times 2\frac{1}{2}$
- 6. Briefly describe the Lamport logical clock. What are its limitations ?  $3 + 2$

**GROUP - C**

**( Long Answer Type Questions )**

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

- 7. a) Explain briefly the concept of RPC.
- b) Discuss how process migration is done in a distributed system.
- c) Explain diskless workstation.  $6 + 6 + 3$



8. a) What is Clock synchronization ? How computer clocks are implemented ? What is clock drift ?  
b) What do you mean by a happened-before relation ? What are the conditions and Implementation Rules for happened-before relations satisfy ?  
c) Describe Ricart-Agrawala distributed mutual exclusion algorithm.  $(2 + 2 + 1) + (2 + 3) + 5$
9. a) What is distributed scheduler ? Write down the techniques for scheduling process of a distributed system.  
b) Explain distributed shared memory with diagram.  
c) Define global and local states in distributed system.  
 $(2 + 4) + 6 + 3$
10. a) Briefly describe process synchronization in multiprocessor operating system using Test and set instruction and swap instruction.  
b) Write down the general structure of a cryptographic system. Name the different types of cryptographic system.  
c) Write down the difference between virus and worms. Briefly describe digital signature.  $6 + (3 + 2) + 4$
11. Write short notes on any *three* of the following :  $3 \times 5$
- a) Stateless and stateful server
  - b) Models of Deadlock
  - c) Hypercube Architecture
  - d) Distributed file system
  - e) Queing Theory.

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