



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (CSE)/SEM-7/CS-704D/2010-11

2010-11

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) type of transparency is major issue for the
design of RPC facility

- ☒ a) Syntactic transparency
- b) Semantic transparency
- c) Both (a) & (b)
- 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) Wait-die scheme is a scheme.

- a) deadlock detection
- ☒ b) deadlock prevention
- c) deadlock avoidance
- d) deadlock recovery.

v) For designing distributed file system transparency is required.

- a) access
- b) naming
- c) replication
- ☒ 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 of its

- a) code section and data section
- b) other operating system resources
- ☒ c) both (a) & (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

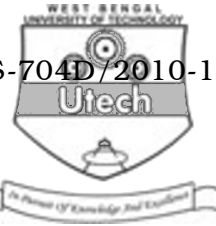
- a) always
- b) if timestamp of $P_1 < P_2$
- c) if timestamp of $P_1 > P_2$
- d) when P_2 has finished.

x) If a is the event of sending a message M in process P_i and b is the event of receiving the same message M at process P_j which of the following timestamp relations is true ?

- a) $C_i(a) < C_i(b)$ b) $C_i(a) < C_j(b)$
c) $C_j(a) < C_j(b)$ d) $C_i(a) = C_j(b)$.

Answer any *three* of the following.

2. Briefly describe the distributed computing system models.
3. With diagram describe the differences between loosely coupled system and tightly coupled system.
4. What is critical section problem and how is it solved by semaphore ? 2 + 3
5. Briefly describe the models of deadlock.
6. Write down the difference between virus and worms. Briefly describe digital signature. 2 + 3



GROUP – C

(Long Answer Type Questions)

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

7. a) What are the limitations of Distributed System ?

Explain any one distributed deadlock algorithm.

- b) Discuss how process migration is done in a distributed system. $(4 + 5) + 6$

8. a) Briefly describe the Lamport's logical clock. What are its limitations ?

- b) What do you mean by happened-before relation ? What are the conditions and implementation rules for happened-before relations to satisfy ?

- c) Describe Lamport's distributed mutual exclusion algorithm. $(3 + 2) + (2 + 3) + 5$



9. a) What is distributed scheduler ? Write down the techniques for scheduling process of a distributed system.

b) Explain load balancing technique for scheduling processes in distributed system.

c) "Load sharing is more important than Load balancing."
Explain. $(2 + 4) + 6 + 3$

10. a) Briefly describe the basic classes of multiprocessor operating systems.

b) Write down the general structure of a cryptographic system. Name the different types of cryptographic system.

c) Define global state and local state in distributed system.
 $6 + (3 + 2) + 4$



11. Write short notes on any *three* of the following : 3 × 5

- a) Distributed shared memory
- b) Transparency properties in distributed system
- c) Multistage interconnection network
- d) Remote procedure call (RPC)
- e) Network OS.

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