MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : IT-704A

PUID : 07052 (To be mentioned in the main answer script)

DISTRIBUTED 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 any *ten* of the following : $10 \times 1 = 10$

i) In distributed system each processor has its own

a) local memory b) clock

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

ii) Processes on the remote systems are identified by

a) host ID

b) host name and identifier

c) identifier

d) process ID.

iii) In distributed file system, a file is uniquely identified by

a) host name

b) local name

c) the combination of host name and local name

d) none of these.

iv) If timestamps of two events are same, then the events are

a) concurrent

b) non-concurrent

c) monotonic

d) non-monotonic.

v) Communication is achieved in distributed system by

a) disk sharing

b) shared memory location

c) file sharing

d) message passing.

vi) Which of the following is not the feature of distributed system ?

a) It is a collection of processors

b) Processors communicate with one another through high speed buses

c) Processing must be done within defined constraint or the system will fail

d) Each processor has its own local memory.

vii) Which of the following is not a distributed computing model ?

a) Minicomputer model

b) Workstation model

c) Processor pool model

d) None of these.

viii) Which deadlock model is used for resource acquisition ?

a) Single-Unit b) AND

c) OR d) AND-OR.

ix) Different issues to be dealt with in case of designing a distributed system are

a) Scalability

b) Compatibility

c) Resource Management

d) All of these.

x) Which technique is based on compile-time program transformation for accessing remote data in a distributed-memory parallel system ?

a) Cache coherence scheme

b) Computation migration

c) Remote procedure call

d) Message passing.

xi) Chandy-Mishra-Hass algorithm in case of distributed system is for

a) distributed deadlock detection

b) distributed mutual exclusion

c) distributed file systems

d) global state recording.

xii) Granularity refers in a distributed shared memory

a) page size

b) block size

c) virtual address space

d) logical address space.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. With diagram describe loosely and tightly coupled system. What are the limitations of distributed operating system ?

3. What is the difference between Remote Procedure Call and Remote Method Invocation ?

4. Explain the process migration mechanism in distributed systems.

5. Explain the concept of communication in case of Slotted Ring protocol.

6. Explain the replacement strategy used in distributed shared memory.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is Lamport Logical clock ?

   b) What are the limitations of Lamport Logical clock.

   c) What are the necessary conditions satisfied by the system of clocks ? Describe with example.

   d) Briefly discuss "Chandy Lamport Global State Recording Algorithm".

8. a) Describe different issues in deadlock detection and resolution.

   b) Describe a "Path-Pushing Algorithm" and mention its limitation of this algorithm.

c) Briefly describe "Edge – Chasing Algorithm" for distributed deadlock detection.

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

a) Digital signature

b) Memory coherence

c) Global State Detection Algorithm

d) Design issues in Remote Procedure call (RPC)

e) Inter Process Communication (IPC).

10. a) Briefly discuss Ricart-Agarwala Algorithm for Mutual exclusion handling in distributed systems.

b) What do you mean by Global State?

c) Differentiate between Tightly Coupled and Loosely Coupled Systems.

11. 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 ?

b) In the design of a distributed file system, high availability and high scalability are mutually related properties. Discuss.

c) In the design of a distributed file system, high performance and high reliabililty are mutually related properties. Discuss.

d) What is an immutable file ? Can a file system be designed to function correctly by using only immutable files ? Explain.