[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2125)

15270

B. Tech 7th Semester Examination

Distributed Operating System (OS)

CS-7002

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one from each of the Sections A, B, C & D, Section E is compulsory.

SECTION - A

1. What are the following properties in distributed operating system

   (i) Autonomy

   (ii) Concurrency

   (iii) Scalability

   (iv) Reliability

   (v) Fault tolerance. (20)

2. Explain fundamental challenges in distributing processes across multiple hosts (all running the same distributed OS). Consider the problems in the context of resource allocation, resource access, inter-process communication and shared memory. (20)

[P.T.O.]

SECTION - B

3. What is transparency in distributed system? With examples describe Access, Location and Migration transparency in a distributed system. (20)

4. Distributed file systems use two different methods to provide file data - remote service or local caching. Explain them in detail. What advantages does a remote service distributed file system have over a caching system? What advantages does a caching distributed file system have over a remote service system? (20)

SECTION - C

5. What is distributed shared memory? Name various issues in distributed shared memory and describe proposed solution for each. (20)

6. Give the typical requirements of a secure distributed system. Explain how man-in-the-middle attack in a distributed system can be defeated? (20)

SECTION - D

7. We can use a coordinator in distributed transactions to decide and communicate whether to abort or commit a transaction. Why is it necessary that the coordinator uses a two-phase commit (2PC) protocol rather than a one-phase commit protocol? Explain working of 2PC in detail. (20)

8. Define serial equivalence for transactions. Explain in detail the ACID properties for transactions in distributed systems. (20)

SECTION - E

9. (a) Define remote procedure call.

(b) With example explain middleware.

(c) How does cache replacement policy in the distributed system differ from page replacement policy?

(d) Define distributed database.

(e) What are the main advantages and disadvantages of a non-preemptible kernel?

(f) In the context of distributed shared memory, what is false sharing and why is it relevant?

(g) Explain the need of replication in a distributed environment.

(h) What are pipes in context of operating system?

(i) Explain need of load balancing.

(j) Differentiate between authentication and authorization. (2×10=20)