

Total No. of Questions : 12]

SEAT No. :

P924

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[Total No. of Pages : 3

B.E. (Computer Engineering) (Semester - II)
DISTRIBUTED OPERATING SYSTEMS
(2008 Course)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer three questions from each section.*
- 2) *Answer to the two sections should be written in separate answer - books.*
- 3) *Neat diagrams must be drawn whenever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) For each of the following applications, do you think at least once semantics or at most semantics is best? Discuss. **[6]**
- i) reading and writing files from a file server.
 - ii) compiling a program.
 - iii) Remote banking
- b) What are the following properties in Distributed OS **[10]**
- i) Autonomy and independence.
 - ii) Concurrency and parallelism.
 - iii) Scalability
 - iv) Reliability and fault to tolerance

OR

- Q2)** a) Explain the following with respect to distributed operating system **[8]**
- i) Scalability
 - ii) Process synchronization
 - iii) Data migration.
 - iv) Computation migration
- b) What is the relevance Synchronous and Asynchronous Communication in the distributed system? Explain it with the diagrammatic representation and its utilization in inter process communication mechanism (Socket / RMI/RPC). **[8]**

P.T.O.

- Q3)** a) Explain the following with respect to synchronization in distributed operating system. [10]
- i) Clock skew
 - ii) Drift rate
 - iii) Causal ordering
 - iv) Partial ordering
- b) Consider the behaviour of two machines in a distributed system. Both have clocks that are supposed to tick 1000 times per millisecond. One of them actually does, but the other ticks only 990 times per millisecond. It maximum clock skew that will occur? [6]

OR

- Q4)** a) Give an example to show why event ordering is most important in most of the distributed application? Explain total ordering and compare it with partial ordering. [10]
- b) Suppose that two processes detect the demise of the coordinator simultaneously and both decide to hold an election using bully algorithm. What happens? [6]

- Q5)** a) What is the basic difference between token based and non - token based algorithm for mutual exclusion? [6]
- b) In the processor allocation algorithms, we pointed out that one choice is between centralized and distributed and another is between optimal and suboptimal. Devise two optimal location algorithms, one centralized and one decentralized. [12]

OR

- Q6)** a) Distributed deadlock detection algorithms normally have substantial message overhead, even when there is no deadlock. Instead of using a deadlock detection algorithm, we can handle deadlocks in distributed systems simply by using “timeouts” i.e. after waiting certain time declares that it is deadlock, what are the risks in using this method? Explain the above scenario by comparing this with any deadlock detection algorithm. [10]
- b) Show that Byzantine agreement cannot always be reached among four processor if two processor are faulty. [8]

SECTION - II

- Q7)** a) Explain the architecture of Network file system. Also explain the following properties of NFS. [10]
- i) Naming and location.
 - ii) Caching

- b) What is naming property of the distributed file system? Why do some distributed system uses two level naming? [8]

OR

- Q8)** a) Explain various issues in designing load balancing algorithms. What is load balancing approach and load sharing approach in distributed scheduling? [6]
b) Explain design issues of Distributed File System. [6]
c) Write and explain Receiver initiated algorithm in Distributed scheduling. [6]

- Q9)** a) Explain backward error recovery. What are various approaches for backward error recovery? What are the major problems associated with backward error recovery approach? [8]
b) What is Rollback? How does it help in recovery mechanism? Explain in details the rollback recovery algorithm. [8]

OR

- Q10)** a) Define Livelock. What is the difference between a deadlock and a livelock? [6]
b) How do we achieve the security in the distributed operating system? Show lock key method of access control is identical to access list control method with protection group. [10]

- Q11)** a) Explain SOA design and deployment. [4]
b) Explain Cloud Computing architecture and its application. [6]
c) Explain with diagram Grid Architecture. Also explain how grid computing works. [6]

OR

- Q12)** a) Explain the relation of the following system with distributed system. [10]
i) cluster computing
ii) grid computing
iii) cloud computing
iv) service oriented architecture
b) Explain the following with respect to cloud computing. [6]
i) elements of cloud computing
ii) features of cloud computing
iii) advantages and disadvantages

