Exam No: _____

GANPAT UNIVERSITY
M. Tech. Semester- II Information Technology
Regular Examination July - 2013
3IT202: Advanced Operating Systems

Time:-3 Hours]

[Total Marks: 70

Instructions:
1. Figures to the right indicate full marks.
2. Each section should be written in a separate answer book.
3. Be precise and to the point in your answer.

SECTION – I

Q – 1 (A) How distributed systems differ from centralized systems? Explain openness and scalability of distributed systems. [4]

(B) Differentiate: Tightly-coupled software on loosely-coupled hardware and loosely-coupled software on loosely-coupled hardware. [4]

(C) What are the problems with centralized clock synchronization algorithms? Discuss any distributed clock synchronization algorithm. [4]

OR

Q – 1 (A) Discuss distributed systems architecture in terms of hardware concepts. [6]

(B) Explain importance of event ordering in distributed systems with example. [4]

(C) According to vector clock give vectors of messages which are concurrent and causally related. Assume three processes in system. [2]

Q – 2 (A) Discuss lamport's logical clock for event ordering. Also explain its limitations. [6]

(B) Pretransferring technique of address space transfer increases the total time of migration. Explain how? [5]

OR

Q – 2 (A) What is clock synchronization in distributed systems? Explain importance of clock synchronization with make program in Unix. [6]

(B) Which one or more of the message-forwarding mechanisms are suitable for process migration facility with following goals? Give name of message-forwarding mechanisms and reason. [5]
   (a) Transparency
   (b) Reliability
   (c) Performance
   (d) Simple implementation

Q – 3 (A) Discuss distributed algorithm for mutual exclusion in distributed system with example. Also give its drawbacks. [6]

(B) Describe desirable features of a good process migration mechanism. [6]

SECTION – II

Q – 4 **(A)** Write diffusion computation based algorithm for deadlock detection. [6]

(B) Give example of consistent set of checkpoints in recovery system. Also explain method for taking consistent set of checkpoints. [6]

OR

Q – 4 **(A)** Describe following terms of concurrent recovery with examples. [6]
   a. Orphan message
   b. Domino effect
   c. Lost message

(B) What are the problems with centralized algorithms for distributed deadlock detection? Describe edge-chasing algorithm with example for deadlock detection. [6]

Q– 5 **(A)** What is recovery in computer system? Explain types of error recovery and also differentiate it. [4]

(B) What are periodic task and sporadic task in real time systems? Give examples. [4]

(C) What is livelock in recovery of concurrent system? Explain with example. [3]

OR

Q – 5 **(A)** In your opinion, where (in server main memory, in client disk, in client memory) should a cache for caching data be located in the following types of distributed file systems? (Give reason) [6]
   a. One that supports diskless workstation
   b. One that uses file-level transfer model as unit of data access
   c. One that is designed to occasionally support disconnected operation.

(B) Describe oral message algorithm for agreement with suitable example. [5]

Q – 6 **(A)** Consider three tasks T_1 = (3, 0.8), T_2 = (4, 1.1), T_3 = (6, 2.0) where first figure in task indicates deadline and second indicates execution time require by each job to finish its execution. Perform **RMS, EDF,** and **LST** scheduling of jobs with above data. (Show scheduling up to clock tick 10). [8]

(B) What is the lower bound for number of faulty processors in byzantine agreement problem to reach agreement? Give example to support your equation. [4]

END OF PAPER