Q.P. Code : 825400

(3 Hours) [Total Marks : 80

N.B. : (1) Question **No.1** is **Compulsory**.
(2) Attempt **any three** questions out of remaininig **five** questions.
(3) Assume suitable data whenever required but jusify the same.
(4) Assumption made should be clearly stated.

1. (a) A distributed system may have multiple, independent critical regions. 5
Imagine that process 0 wants to enter critical region A and process i
wants to enter critical region B. Can Ricart and Agrawala's algorithm
lead to deadlocks? Explain your answer.
(b) Compare Cyclic and Table Driven-Schedulers. 5
(c) What are the different design goals of Mach distributed operating system? 5
(d) What is logical clock ? With the help of example explain limitation of 5
logical clock.

2. (a) What are the problems associated with two phase locking? Explain how 10
Two phase locking increases concurrency in transaction execution relative
to static locking.
(b) What is the selection criterion for load sharing algorithm based on 10
performance for different system under consideration? Explain.

3. (a) Give comparative performance analysis of different mutual exclusion 10
algorithms in terms of response time, synchronization delay, message
traffic, light load, heavy load.
(b) Explain Rate Monotonic scheduling Algorithm (RMA). What is 10
Schedulability Test for RMA?

4. (a) Consider following set of periodic tasks. If cyclic scheduler is used to 10
run these tasks then what appropriate frame size should be selected?
Task $T_1 = (E_1=1, P_1=5)$, Task $T_2= (E_2=1, P_2=10)$,
Task $T_3= (E_3=2, P_3=20)$, and Task $T_4 = (E_4= 2, P_4=20)$, Where E is
execution time and P is period.

(b) Explain Non-blocking Commit protocol for single site failure. 10

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5. (a) Explain priority inversion protocol (PIP) to share critical resource among tasks. **10**

    (b) What is byzantine agreement problem? With the help of example prove that no solution exist for byzantine agreement problem for three processors. **10**

6. (a) Explain process management in Amoeba distributed operating system. **10**

    (b) Explain different concurrency control algorithms for fully replicated database systems. **10**