

(3 hrs)

Marks: 80

- N.B. (1) Question one is Compulsory.
 (2) Attempt any 3 questions out of the remaining.
 (3) Assume suitable data if required.
- Q1. a) What are various issues of distributed system? 05
 b) Suppose through experimentation it was verified that 70% of execution was spent on parallelizable execution. What are the maximum speedup and efficiency those can be achieved with 8 processors? 05
 c) Justify how Ricart-Agrawala's algorithm optimized the Message overhead in achieving mutual exclusion. 05
 d) Give examples for the following message communication models 05
 • Transient Synchronous
 • Response based synchronous communication
 • Transient asynchronous
 • Persistent Asynchronous
 • Receipt based communications
- Q2. a) Brief the different load estimation policies and process transfer policies used by Load balancing algorithm. 10
 b) Discuss the Structural and Data hazards in Pipeline architecture. Discuss any one technique to control / mitigate them in detail. 10
- Q3. a) Design and analyze 3-stage pipeline operations executing the following task: 10
 $X_n + Y_n * Z_n$, for $n = 1, 2, 3, \dots, 7$.
 b) Describe any one method of Logical Clock synchronization. 10
- Q4. a) Clearly explain how Monotonic Read consistency model is different from Read your Write Consistency model. Support your answer with suitable example application scenarios where each of them can be distinctly used. 10
 b) Discuss the need for process migration and the role of resource to process and process to resource binding in process migration 10
- Q5. a) Apply quicksort parallel algorithm for the following example: 10
 16, 08, 33, 45, 25, 19, 53, 06
 b) Differentiate between Distributed OS, Network OS and Middleware based OS 10
- Q6. Write a note on **any two** of the following 20
 a) Hadoop Distributed File System
 b) Systolic Architecture
 c) RPC and RMI
