(3 hrs) **Marks: 80**

N.B. (1) Question one is Compulsory.
(2) Attempt any 3 questions out of the rest.
(3) Assume suitable data if required.

Q1. a. What are various system models of distributed system? **(05)**

b. Prove that a k-stage linear pipeline can be at-most k times faster than that of a non-pipelined serial processor. **(05)**

c. Compare parallel and distributed Systems by giving real time examples for each **(05)**

d. The time required to execute a task with single processor is 1200ms and with 8 processors it takes 200ms. Find the efficiency of parallel computing. **(05)**

Q2. a. Illustrate 4-stage pipeline architecture. **(10)**

b. Differentiate between Message oriented & Stream oriented communications **(10)**

Q3. a. Describe any one method of Logical Clock synchronization with the help of an example. **(10)**

b. Illustrate the parallel algorithm for sorting numbers in ascending order with an example and analyze the performance of this algorithm in terms of parallel run time and communication cost. **(10)**

Q4. a. What is the need for process migration and explain the role of resource to process and process to resource binding in process migration. **(10)**

b. Illustrate the implementation details of pipelined floating-point adder. **(10)**

Q5. a. Discuss and differentiate various client-centric consistency models by providing suitable example application scenarios. **(10)**

b. Discuss Ricart-Agrawala's algorithm and Justify how this algorithm optimized the message overhead in achieving mutual exclusion. **(10)**

Q6. Write a short note on any two **(20)**

a. File cashing schemes

b. An architecture of Information System

c. Load balancing techniques

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