Final Assessment Test – November 2018

Course: CSE4001 - Parallel and Distributed Computing

Class NBR(s): 5872 / 5884 / 5891 / 5892 / 5895 / 5897 / 5900 / 6394 / 6735

Slot: B2

Time: Three Hours

Max. Marks: 100

Answer ALL Questions
(10 X 10 = 100 Marks)

1. a) List the challenges in parallel processing. [4]

   b) Let a program have 40 percent of its code enhanced (so f_E = 0.4) to yield a system speedup 4.3 times faster (so S = 4.3). What is the factor of improvement f_I of the portion enhanced? Justify the resulting speedup efficiency with the actual system speedup. [6]

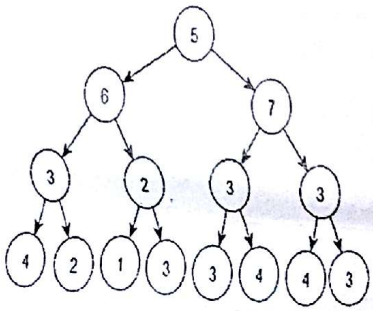
2. What are the major differences between message-passing and shared-address-space mechanisms? Also outline the advantages and disadvantages of the two.

3. a) For the given weighted task-dependency graphs, determine the following for each graph: [6]

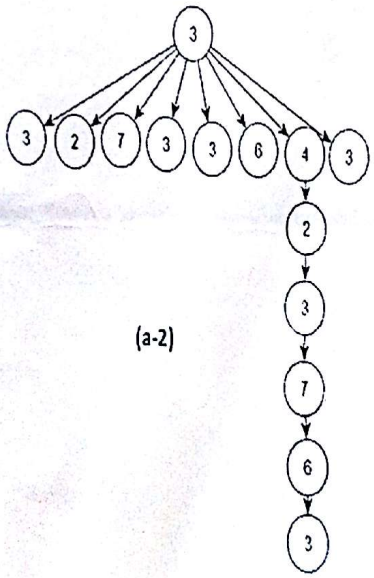
   (i) Maximum degree of concurrency

   (ii) Critical path length

   (iii) Average degree of concurrency



(a-1)



(a-2)

   b) Explain the task dependency graph and its significance in parallel algorithm design with an appropriate example. [4]

4. a) Compare and contrast RMI and RPC [3]

   b) Explain marshalling / unmarshalling mechanism in RMI [7]

5. Explain the different distributed physical clock synchronization algorithms with their relative advantages and disadvantages.

6. a) Explain Cluster-Based Distributed File Systems with suitable diagram. [7]

   b) Explain whether or not NFS is to be considered a distributed file system. [3]

7. a) Enlist and explain three service models and four deployment models of cloud computing. [7]

   b) Why should one prefer public cloud over private cloud? [3]

8. a) List a number of possible applications of MapReduce. [4]

b) Describe one possible application and sketch how this would be implemented in MapReduce, providing in particular outline implementations of the Map and Reduce functions? [6]

9. Design Broadcast communication (MPI_Bcast) using MPI_Send and MPI_Recv primitives.

10. a) What are the potential advantages and risks while using Grid computing? [4]

b) Define Concurrency Control. Enumerate the use of locks in strict two-phase locking. [6]

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