BE (IT) 4th Year 1st Semester Supplementary EXAMINATION 2017

PARALLEL PROCESSING

Time : 3 Hours

Full Marks : 100

Answer Any Five

1. Explain the following:-
   a) Scalability
   b) Barrier Synchronization
   c) Parallel Computing & Distributed Computing
   d) Parallel Overhead
   e) PRAM
   (5x4)

2.a) Two huge arrays need to be added and multiplied with respect to the individual elements (element wise addition and multiplication); and the results are to be kept in the two resultant arrays (one will have the result of the addition and the other one will have the result of the multiplication). Compute the speed-up if control parallel approach is used to do the parallel processing. Also, compute the speed-up if Data Parallel approach is used to do the parallel processing. This problem will be run in a machine where there are 4 processors.

b) Explain the KARP-FLATT Metric.
   ((6+6)+8)

3.a) Draw a Binary Tree Network of Depth 4. Now compute the values of the following parameters:-
   i) Number of Processor Nodes
   ii) Number of Switch Nodes
   iii) Diameter of the Network
   iv) Bisection width
   v) Edges Per Node
   vi) Whether the Network has constant edge length.

b) With proper diagram, explain the 'Multicomputer' type of parallel computing architecture. Why cache problem is not there in this type of architecture?
   ((4+6)+10)

4. The problem is about finding the square root of each and every element of a huge array. The result of the square root needs to be placed in another array. Using Thread, MPI and OpenMP approach write 3 different parallel programs to solve the above problem.
   (6+7+7)

5.a) What are the different methods available for parallel matrix multiplication? Explain one of them in detail.

b) What are the different methods available for parallel sorting? Explain one of them in detail.
   (10+10)

6. Explain all the four steps of Foster Design Methodology in detail.
   (5x4)