MCSE-011

MCA (Revised)

Term-End Examination

December, 2007

MCSE-011 : PARALLEL COMPUTING

Time : 3 hours *Maximum Marks : 100*

Note : *Question number 1 is* ***compulsory****. Attempt any* ***three*** *questions from the rest.*

1. (a) State and explain the law which uses the notion of constant execution time. Explain with the help of an example. *10*

(b) Explain the concept of permutation network with an example. Discuss Perfect Shuffle permutation and Butterfly permutation. *10*

(c) State and explain different fundamental parameters required for the analysis of parallel algorithm. *10*

(d) What are the problems faced in super scalar architecture ? How can these problems be removed in VLIW architecture ? *10*

2. (a) Explain parallel virtual machine and list its salient features. 5

(b) Explain message passing with the issues decided by the system in the process of message passing. 5

(c) Explain Bens Network as a non-blocking network. Show the interconnection of Bens Network for the following permutation : 10

$$P = \begin{bmatrix} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 0 & 7 & 6 & 2 & 5 & 3 & 9 & 1 \end{bmatrix}$$

3. (a) Describe the property of the Merge Sort circuit sequence and sort out the following list of values in ascending order using an odd-even merging circuit consisting of a set of comparators.

A = (4, 6, 9, 10)

B = (2, 7, 8, 12)

Also show the intermediate steps. 10

(b) Draw instruction execution steps in Flynn's Classification and discuss the Flynn's Classification based on instruction and data stream. 10

4. (a) What is the concept of message passing libraries ? Explain two different types of message passing libraries with their merits and demerits. 10

(b) Explain pipeline processing and describe the architecture of pipeline processing. 10

5. (a) Discuss Block distribution and Cyclic distribution with their example. *6*

(b) Explain difference between the following : *6*

(i) Tightly coupled system and Loosely coupled system

(ii) Vector processing and Scalar processing

(c) Explain the concept of Thread with basic methods in concurrent programming languages for creating and terminating of threads. Also give the advantages the thread offers over other processes. *8*