

B.Tech IV Year II Semester (R13) Advanced Supplementary Examinations July 2017

**HIGH PERFORMANCE COMPUTING**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

**PART – A**

(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Write about VLIW processors.
  - Explain the need for parallel computing.
  - Write about the mapping techniques for load balancing.
  - Write about improving the speed of communication operators.
  - Write about the basic building blocks of message passing paradigm.
  - Explain the need for thread programming.
  - Write about the synchronization primitives in open MP.
  - Write about the difference between shared memory and distributed memory programming.
  - Write about the parallel quick sort.
  - Write about analysis of average speed up in parallel DFS.

**PART – B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

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

**OR**

- 3 Explain in detail about the interconnection networks used for parallel computers.

**UNIT – II**

- 4 Explain in detail about the techniques for dynamic mapping.

**OR**

- 5 Explain about all-to-all broadcast and reduction.

**UNIT – III**

- 6 Write a program to implement matrix multiplication using open MP primitives.

**OR**

- 7 Explain about synchronization primitives in pthreads.

**UNIT – IV**

- 8 Show that the block-based bitonic sort algorithm that uses compare-split operations is correct.

**OR**

- 9 Explain parallel implementation of Gaussian elimination method with 2-d partitioning.

**UNIT – V**

- 10 Explain the parallel depth-first search.

**OR**

- 11 Explain the parallel formulation of Dijkstra's single-source algorithm.

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