

B. E. (Computer Engineering)

HIGH PERFORMANCE COMPUTING

(2015 Pattern) (Semester - I) (410241)

Time : 2½ Hours]

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.

[Max. Marks : 70

- a) State and explain basic working principle of Super Scalar Processors. [6]
- b) Explain basic working of VLIW Processor. [6]
- c) Elaborate four subclasses of the Parallel Random Access Machine (PRAM). [8]

OR

- a) Differentiate Static and Dynamic mapping techniques for load balancing. [6]
- b) Write a short note on All-to-one reduction with suitable example. [6]
- c) Explain any four methods for containing interaction overheads. [8]

- a) Explain Parallel Matrix-Vector Multiplication algorithm with example. [8]
- b) Explain the Performance Metrics for Parallel Systems. [8]

OR

- a) Explain Parallel Matrix-Matrix Multiplication algorithm with an example. [8]
- b) Interpret the effect of Granularity on Performance of parallel execution. [8]

- a) Compare an algorithm for sequential and parallel Merge sort. Analyze the complexity for the same. [8]

- b) Modify Depth First Search for parallel execution and analyze its complexity. [8]

OR

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- Q6) a) Discuss the issues in sorting for parallel computers. [8]

- b) Explain Dijkstra's shortest path algorithm. [8]

- Q7) a) Explain parallelism in Best First Search algorithm. Give an appropriate example. [8]

- b) Design a simple CUDA kernel function to multiply two integers. [6]

- c) List APIs for dealing with CUDA device memory. [4]

OR

- Q8) a) Describe CUDA Architecture in details with neat diagram. [8]

- b) Write advantages and limitations of CUDA. [5]

- c) Give five applications of CUDA. [5]