P3331

[5461]-591

B. E. (Computer Engineering)
HIGH PERFORMANCE COMPUTING
(2015 Pattern) (Semester - I) (410241)

Time : 2½ Hours]   *[Max. Marks : 70*

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.*

Q1) 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

Q2) 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]**

Q3) a) Explain Parallel Matrix-Vector Multiplication algorithm with example. **[8]**

     b) Explain the Performance Metrics for Parallel Systems. **[8]**

OR

Q4) a) Explain Parallel Matrix-Matrix Multiplication algorithm with an example. **[8]**

     b) Interpret the effect of Granularity on Performance of parallel execution. **[8]**

Q5) 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 Dijkstras 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]**

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