Total No. of Questions : 8]

SEAT No. :

P3232

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B.E. (Computer Engineering)
HIGH PERFORMANCE COMPUTING
(2012 Pattern) (Semester - II) (410450) (End Semester)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***First two questions are compulsory. Answer three questions [(Q.3 or Q.4), (Q.5 or Q.6), (Q.7 or Q.8)].***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data if necessary.***

Q1) a) Explain MIMD and SIMT architecture. **[4]**

b) Explain Granularity, concurrency and dependency graph. **[6]**

Q2) a) Write a short note on Exploratory and Speculative Decomposition. **[6]**

b) Explain Non Blocking Communication using MPI. **[4]**

Q3) a) Why synchronization is important? Enlist Thread API's for mutex synchronization. **[8]**

b) Differentiate between thread and process. For multithreading implementation there is implicit support of architecture. Justify. **[7]**

OR

Q4) a) Implement MergeSort using synchronization primitives in Pthreads. **[8]**

b) Explain OPENMP : a Standard for Directive Based parallel programming. **[7]**

P.T.O.

Q5) a) How pivot selection is crucial factor for algorithm performance? Explain. **[7]**

b) Explain Cannon's Algorithm for matrix multiplication with suitable example. **[8]**

OR

Q6) a) How latency hiding is different than latency reduction. **[8]**

b) Explain the concept of distributed Shared Memory. **[7]**

Q7) a) Write a short note on : (Any Two) **[14]**

i) Petascale Computing

ii) Recent Developments in Nanotechnology

iii) Optical Computing

b) Explain speedup and efficiency attribute of performance analysis of parallel algorithms. **[6]**

OR

Q8) a) Write a short note on : (Any Two) **[14]**

i) Quantum Computers

ii) Parallel Depth First Search

iii) Power Aware Processing

b) Explain in short Bubble Sort and its variants. **[6]**

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