Total No. of Questions : 8]

SEAT No. :

**P3116**

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# [5154]-683

## B.E. (Computer Engineering)

## HIGH PERFORMANCE COMPUTING

## (2012 Pattern) (Semester -II) (410450) (End Sem.)

*Time : 2 ½ Hour]* *[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) What are applications of Parallel Computing? **[4]**

b) Explain Granularity, Concurrency, and Dependency Graph **[6]**

***Q2)*** a) What are principles of Message Passing Programming **[6]**

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

***Q3)*** a) Describe Logical Memory Model of a thread? **[7]**

b) Why synchronization in important? Enlist Thread APIs for Mutex Synchronization. **[8]**

OR

***Q4)*** a) Implement Merge sort using synchronization primitives in Pthreads. **[7]**

b) Illustrate importance of read-write lock for Shared address space Model. **[8]**

***Q5)*** a) What are different partitioning techniques used in Matrix-Vector Multiplication. **[7]**

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

OR

***Q6)*** a) Describe different techniques for Latency Hiding. **[7]**

b) How Latency Hiding is different than Latency Reduction? **[8]**

***P.T.O.***

***Q7)*** a) Write a short note on (Any Two) **[15]**

i) Parallel Depth-First-Search.

ii) Search Overhead Factor.

iii) Power Aware Processing.

b) Elucidate Thread Organization in detail. **[5]**

OR

***Q8)*** a) Write a short note on (Any Two) **[15]**

i) Distributed Memory.

ii) Optical Computing.

iii) Green Computing.

b) Intricate sorting issues in parallel computers. **[5]**

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