

Total No. of Questions : 8]

SEAT No. :

**P3116**

[Total No. of Pages : 2

**[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 is 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]

