

Total No. of Questions : 8]

SEAT No. :

PE-2182

[Total No. of Pages : 2

[6584]-81

**B.E. (Computer Engineering)**  
**HIGH PERFORMANCE COMPUTING**  
**(2019 Pattern) (Semester - VIII) (410250)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.

- Q1)** a) What is one-to-all broadcast? Explain it with the help of algorithm for one-to-all broadcast on hypercube. Comment on cost calculation. [7]
- b) Explain circular shift operation? [6]
- c) Write a short note on prefix-sum operation. [4]

OR

- Q2)** a) Explain with example and algorithm all-to all broadcast on 3 \* 3 mesh [7]
- b) Explain cost analysis of all to all broadcast operation. [6]
- c) Explain Scatter and Gather operations. [4]
- Q3)** a) Explain parallel Matrix—Matrix multiplication algorithm with example? [7]
- b) Explain circular shift operation on mesh and hypercube network. [6]
- c) How to improve speed of communication operation. [4]

OR

- Q4)** a) What is granularity? What are effects of granularity on performance of parallel systems? [7]
- b) Explain sources of overhead in parallel program. [6]
- c) Explain performance matrices of parallel systems. [4]

P.T.O.

- Q5)** a) What is CUDA? Explain different programming languages support in CUDA. Discuss any three applications of CUDA. [8]
- b) Describe processing flow of CUDA-C program with diagram. [6]
- c) Explain the following terms in CUDA: device, host, device code, Kernel [4]

OR

- Q6)** a) Explain compare exchange and compare-split operation on parallel Computers. [8]
- b) What are the issues in sorting on parallel computers with example? [6]
- c) Explain odd- even transportation on bubble sort using parallel formulation. [4]

- Q7)** a) Write short notes on : [8]
- i) Parallel Merge Sort ii) GPU Applications
- b) Explain communication strategies for parallel BFS. [6]
- c) What is Kubernets? Explain its features and applications. [4]

OR

- Q8)** a) Explain the recursive decomposition in parallelizing quick sort. [8]
- b) Compare shared address and message passing formulation of quick sort. [6]
- c) Explain Parallel Depth First Search algorithm in detail? [4]

