

# SPPU-BE-COMP-CONTENT – KSKA Git

Total No. of Questions : 8]

SEAT No. :

**PD4589**

[Total No. of Pages : 2

**[6404]-94**

**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, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.

- Q1)** a) Explain Broadcast and Reduce operation with diagram. [6]  
b) Explain Scatter and Gather operation. [6]  
c) Write a short note on Circular shift on a mesh. [5]

OR

- Q2)** a) Explain prefix-sum operation for an eight-node hypercube. [6]  
b) Explain All-to-One Broadcast and Reduction on a ring. [6]  
c) Explain with example and algorithm all-to-all broadcast on  $3 \times 3$  mesh. [5]

- Q3)** a) Explain performance matrices of parallel system. [6]  
b) Explain Matrix – Matrix multiplication in details. [6]  
c) Write a note on minimum and cost optimal execution time. [5]

OR

- Q4)** a) Write a short note on Matrix vector multiplication using: [9]  
i) Row-wise 1D partitioning  
ii) 2D partitioning  
iii) Comparison of 1D and 2D partitioning  
b) Explain the Dense matrix algorithms. [8]  
i) Matrix vector multiplication.  
ii) Matrix-Matrix multiplication.

- Q5)** a) Explain CUDA architecture in details. [9]  
b) Write a short note on: Managing GPU Memory. [9]

OR

**P.T.O.**

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- Q6)** a) Modify DFS for parallel execution and analyze it's complexing. [9]  
b) Explain Dijkstra's algorithm in parallel formulation. [9]

- Q7)** a) Write a short note on Parallel BFS. [4]  
b) Explain the term: Communication strategies in BFS. [5]  
c) Write a note on: [9]  
i) Random Communication Strategy  
ii) Ring Communication Strategy  
iii) Blackboard Communication Strategy

OR

- Q8)** a) Explain odd-even transportation in bubble sort using suitable example. [6]  
b) Write a short note on parallel formulation for CRCW PRAM. [6]  
c) Explain Distributed Computing for Document Classification. [6]

