

Total No. of Questions :10]

SEAT No. :

P3638

[Total No. of Pages :3

[4959] - 1127

B.E. (Information Technology)

d: PARALLEL ALGORITHMS AND DESIGN

(Semester - I) (2012 Course) (Elective - I)

Time : 2½ Hours]

[Max. Marks :70

Instructions to the candidates:

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or 10.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data wherever necessary.*
- 4) *Neat diagrams must be drawn wherever necessary.*

- Q1)** a) What is the difference between data-parallel computation and task-parallel computation? What is parallel efficiency? [4]
- b) Consider the example of parallelizing bubble sort. Explain the performance analysis in serial and parallel versions. [6]

OR

- Q2)** a) Describe pyramid network processor organization for parallel computers. [5]
- b) Write an algorithm to find minimum in parallel model using either CRCW or CREW model. [5]

- Q3)** a) Explain the term bitonic sorter, Bitonic sequence and half cleaner. [6]
- b) What do you mean by cost optimality? What is cost of parallel algorithm? Explain time optimality. [4]

OR

P.T.O.

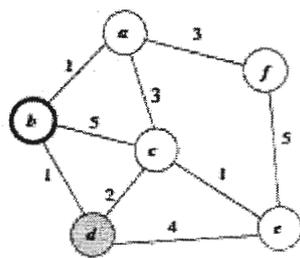
- Q4) a)** Explain the Depth first search with suitable example. **[4]**
- b) What do you mean by overhead function or total overhead of a parallel system, how does this effect on the performance of the parallel algorithms? **[6]**

- Q5) a)** Explain MESH Transpose. Write algorithm for same. **[8]**
- b) Explain Conjugate Gradient Method-Sequential Algorithm. **[8]**

OR

- Q6) a)** Explain eigen values. State suitable example and derive algorithm for finding eigen values. **[8]**
- b) Analyse Cube connected Transpose. Check algorithm for optimality. **[8]**

- Q7) a)** What is MST? Solve Given problem Using Prims algorithm of parallel computing. **[10]**



- b) Define BFS. Write an algorithm for BFS in parallel computing. **[8]**

OR

Q8) a) Define DFS. Write an algorithm of DFS in parallel computing. **[8]**

b) Give the visited node order for each type of graph search, starting with s, given the following adjacency. **[10]**

$\text{adj}(s) = [a, c, d]$

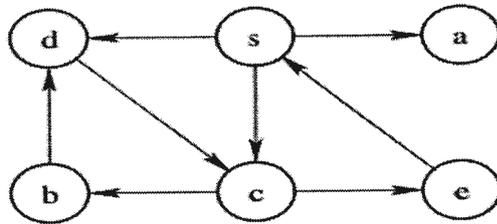
$\text{adj}(a) = []$,

$\text{adj}(c) = [e, b]$,

$\text{adj}(b) = [d]$,

$\text{adj}(d) = [c]$,

$\text{adj}(e) = [s]$.



Q9) a) Explain linear and non-linear pipelines stages in parallel computing? **[8]**

b) Explain the algebraic method in synthesis of parallel algorithm. **[8]**

OR

Q10)a) Explain the knapsack problem with branch and bound algorithm? **[8]**

b) Describe map reduce computation in homomorphism? **[8]**

