Total No. of Questions :10]

SEAT No. :

P3638

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[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 biotonic sorter, Biotonic 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]**

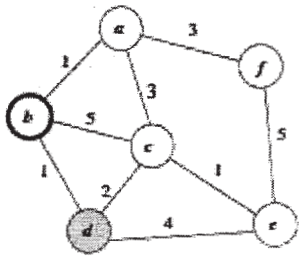
b) Explain Conjugate Gradient Method-Sequential Algorithm. **[8]**

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]**
adj(s) = [a, c, d]

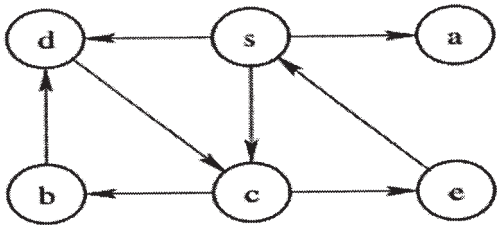
adj(a) = [ ],

adj(c) = [e, b],

adj(b) = [d],

adj(d) = [c],

adj(e) = [s].



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

b) Explain the algebric 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]**