Total No. of Questions : 10]

SEAT No. :

P3131

[Total No. of Pages : 2

[5154]-697
B.E. (I.T.)
PARALLEL ALGORITHMS AND DESIGN
(2012 Course) (Semester - I) (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 Q10.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data wherever necessary.***
4) ***Neat diagram must be drawn where ever necessary.***

Q1) a) With respect to hypercube model, what is a hypercube connection? What is the diameter of an n-node hypercube? **[4]**

b) Design the parallel algorithm to construct merging network and use the same for merge sort. **[6]**

OR

Q2) a) Write bitonic merge sort algorithm. Explain the order of comparators being used in a bitonic merge sort algorithm for 'n' data values. **[5]**

b) What is PRAM model for parallel algorithms? What is the impact of eliminating shared write from PRAM? **[5]**

Q3) a) Write a short note on any 2 with respect to parallel computational model: **[6]**

i) Perfect shuffle computers

ii) Tree model

iii) Pyramid model

b) What is mean by speed up in parallel algorithms? How much performance gain is achieved by parallelizing a given application over a sequential implementation? **[4]**

OR

P.T.O.

Q4) a) Given A, a parallel algorithm with computation time t if parallel algorithm A performs m computational operations, then processor can execute algorithm A in time t+(m–1)/p. Prove this. **[6]**

b) What is Amdahls Effect? Explain. Also discuss Amdahls law. **[4]**

Q5) a) Explain the combinotorial algorithm with example. **[8]**

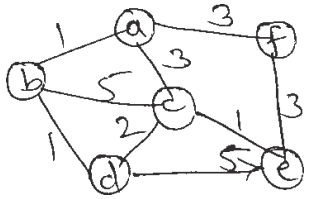
b) Analyse MESH Transpose. Check Mesh Transpose algorithm for optimality. **[8]**

OR

Q6) a) Explain Conjugate Gradient Method-Sequential Algorithm. **[8]**

b) Devise a PRAM algorithm to perform a pre order traversal of a rooted Binary tree. Is this algorithm cost optimal? **[8]**

Q7) a) What is MST? Solve Given problem using Kruskal parallel computing algorithm. **[10]**



b) Discuss hyperquick sort algorithm with an example. **[8]**

OR

Q8) a) Define Graph? State and explain type of Graphs with example. **[10]**

b) Explain the need of BFS Traversal of graph algorithm. **[8]**

Q9) a) What is computer algebra system? Draw and explain its framework. **[8]**

b) Explain Homomorphism-based Structured in Parallel Programming. **[8]**

OR

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

b) Explain the terms and its stages with neat Diagram. **[8]**

i) Pipelines

ii) Homomorphism