Total No. of Questions : 10]

SEAT No. :

P1874

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[4859]-1064

B.E. (Information Technology)

d - 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 and Q9 or Q10 .***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data wherever necessary.***
4) ***Neat diagrams must be drawn wherever necessary.***

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

b) Write algorithm for performing summation S = A(1)+A(2)+A(3)...+A(n) for shared memory model. **[6]**

OR

Q2) a) Design the parallel algorithm to construct merging network and use the same for merge sort. **[6]**

b) Differentiate between the hypercube and cube connected cycle parallel model. **[4]**

Q3) a) What is mean by speed up in parallel algorithms? How much performance gain is achieved by parallelizing a given application over a sequential implementation? **[5]**

b) Write a short note on message passing and shared memory. **[5]**

OR

Q4) a) What is common CRCW PRAM? What is the impact of limiting PRAM model to a fixed number of processors or a fixed memory size? **[5]**

b) What is data parallelism? Explain is it similar to pipelining. Discuss. **[5]**

P.T.O.

Q5) a) Analyse MESH Transpose. Check Mesh Transpose algorithm for optimality. **[8]**

b) Write algorithm for matrix multiplication using cube connected structure. **[8]**

OR

Q6) a) Explain the combinotorial algorithm with example. **[8]**

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

Q7) a) Write short note on any 3: **[12]**

i) Permutation in parallel computing.

ii) Combination in parallel computing.

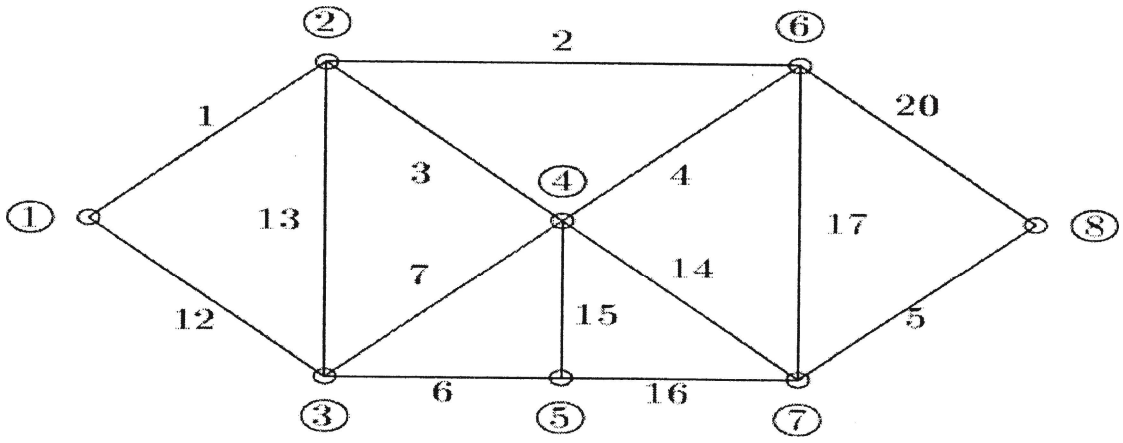
iii) Derangements in parallel computing.

iv) The applications of Depth First Search.

b) Define Graph? State and explain type of Graphs? **[6]**

OR

Q8) a) What is MST? Solve Given problem using Kruskal parallel computing algorithm. **[12]**



b) Explain the need of BFS Traversal of graph algorithm. **[6]**

Q9) a) Explain the terms and its stages with neat Diagram. **[8]**

i) Pipelines.

ii) Homomorphism.

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

OR

Q10)a) What is computer algebra system? Draw and explain its framework. **[8]**

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