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M. Tech. 2nd Semester (CSE) CBCS Scheme

Examination, July-2022

ALGORITHM DESIGN

Paper-MTCSE22C2

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt five questions, selecting one question from each unit and question no. 1 is compulsory.

1. Write a short notes on : 20
 - (a) Describe Depth First search for Graph traversal briefly.
 - (b) What is the difference between Dynamic Programming and Branch and Bound method ? Explain.
 - (c) Explain approximation algorithm briefly.
 - (d) What is Divide and Conquer strategy ? Explain control abstraction for Divide and Conquer.

Unit-I

2. (a) What is priority queue ? Explain priority queue with a decrease key operation. 10
- (b) Explain Asymptotic Notation (Big oh, Theta and Omega) in details. 10

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3. (a) How to make Amortized time analysis to a problem? Explain with the help of example. 10
- (b) Write a short note on : 10
 - (i) Sets
 - (ii) Operations on sets
 - (iii) Algorithms for Union and Find Operation

Unit-II

4. What is minimum spanning tree ? Explain Prim's and Kruskal's Algorithm in details with the help of example. 10
5. (a) Explain Single source shortest path (Dijkstra's Algorithm) with the help of example. 10
- (b) What is Dynamic programming ? Solve travelling salesman problem using dynamic programming. 10

Unit-III

6. (a) Describe Boyer-Moore algorithm for pattern searching in details. 10
- (b) What is NP hard and NP Complete problems ? Explain CNF-Satisfiability with the help of example. 10

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7. (a) Explain Cook theorem in detail. 10
- (b) The Knuth-Morris-Pratt-algorithm for string matching in detail. 10

Unit-IV

8. (a) What are Parallel Random-Access Machines (PRAM) ? Explain various models used for parallel algorithms in detail. 10
- (b) Explain the various data structures used for Parallel Algorithms. 10
9. (a) How to compute parallel complexity of Merging with Parallel computing ? Explain. 10
- (b) Explain ϵ -approximation. Also solve bin packing problem with ϵ -approximation. 10

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