

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2012264

Roll No.

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B.TECH.

Regular Theory Examination (Odd Sem - V) 2016-17

DESIGN AND ANALYSIS OF ALGORITHM

Time : 3 Hours

Max. Marks : 100

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Section - A

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (10×2=20)

- a) List out the disadvantages of divide and conquer algorithm.
- b) What are the fundamental steps involved in algorithmic problem solving?
- c) Write recursive function to find nth Fibonacci number.
- d) Define Binary heap.
- e) Briefly explain the Prim's algorithm.
- f) Define principle of optimality.

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- g) Write the names of various design techniques of algorithm.
- h) Differences between branch & bound and backtracking technique.
- i) What is the running time complexity of 8 queen's problem?
- j) Define P, NP and NP complete in decision problem.

Section - B

Attempt any five questions from this section.

(5×10=50)

- 2. Explain the concepts of quick sort method and analyze its complexity with suitable example.
- 3. Explain the concept of merge sort with example.
- 4. Insert the nodes 15, 13, 12, 16, 19, 23, 5, 8 in empty Red Black Tree and delete in the reverse order of insertion.
- 5. Write short note on Dijkstra 's algorithm shortest paths - Dijkstra's algorithm shortest path problems.
- 6. Write pseudocode for 8 queen problem.
- 7. Write non-deterministic algorithm for sorting.
- 8. What is backtracking? Write general iterative algorithm for backtracking.
- 9. Differentiate NP complete with NP hard.

Section-C

Note: Attempt any 2 questions from this section.

(2×15=30)

- 10. i) State Bellman ford algorithm.
- ii) Consider following instance for simple knapsack problem. Find the solution using greedy method.

N = 8

P = {11, 21, 31, 33, 43, 53, 55, 65}

W = {1, 11, 21, 23, 33, 43, 45, 55}

M = 110

- 11. What is travelling salesman problem? Find the solution of following travelling salesman problem using branch and bound method.

∞	20	30	10	11
15	∞	16	4	2
3	5	∞	2	4
19	6	18	∞	3
16	4	7	16	∞

Cost matrix =

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- 12. Prove that three coloring problem is NP Complete.

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