Reg. No. :

Question Paper Code: 44204

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Fourth Semester

Computer Science and Engineering

14UCS404 - DESIGN AND ANALYSIS OF ALGORITHMS

(Regulation 2014)

Duration: 1:45 hour   Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. What is an algorithm?

2. Differentiate recursive and non-recursive algorithms.

3. List the strength and weakness of brute force algorithm.

4. How divide and conquer technique can be applied to binary trees?

5. Define dynamic programming.

6. State the uses of memory functions to solve knapsack problem.

7. Show the Mathematical formulation to solve a max flow problem.

8. Summarizethe steps to print all edges of minimum cut.

9. Define NP Hard and NP Completeness.

10. Draw a graph with cycle but with no Hamiltonian cycle.

11. What is algorithm design technique?

12. Differentiate time complexity from space complexity.

13. Name four applications of Brute-force approach.

14. What is knapsack problem?

15. State the principle of optimality.

(Answer any three of the following questions)

16. Discuss the fundamentals of analysis framework and notations used in algorithm design. (10)

17. Write an algorithm to perform binary search. Analyze the algorithm for best case worst case and average case. (10)

18. Define spanning tree. Discuss the design steps in prim's algorithm to construct minimum spanning tree with an example. (10)

19. Describe in detail about outline of simplex method. Explain geometric interpretation of Linear programming with example. Trace the simplex method on the following problems.

   Maximize $p= 2x-3y=4z$
   Subject to $4x-3y+z<=3$
                     $x+y+z <=10$
                     $2x+y- z<=10$

   where x, y and z are non negative (10)

20. Define subset sum problem. Apply backtracking to solve the following instance of the subset sum problem. A = {3, 5, 6, 7} and d = 15. (10)

_____

44204