13/6/23 - FN

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50425

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fourth Semester

Computer Science and Engineering

CS 8451 – DESIGN AND ANALYSIS OF ALGORITHMS

(Common to: Computer and Communication Engineering/Information Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is an algorithm?
2. What is the complexity? Give an example.
3. What are the applications of Brute Force exhaustive search?
4. What is meant by divide and conquer method?
5. Define principle of optimality.
6. What is Dynamic programming?
7. Why the maximum flow is required for iteration process?
8. State the properties of Bipartite graph.
9. What is NP hard problem?
10. Define Backtracking.

PART B — (5 × 13 = 65 marks)

11. (a) List and explain the properties of various Asymptotic Notations. (13)

Or

(b) Explain the necessary steps for analyzing the efficiency of recursive algorithms. (13)

12. (a) Write and explain the algorithm to sort a set of N numbers using Quick sort with an example. (13)

Or

(b) With an example, explain the multiplying large integers using Divide and conquer approach. (13)

13. (a) Discuss about Optimal Binary Search Trees using Dynamic programming. (13)

Or

(b) Write an algorithm for 0/1 knapsack problem using greedy method with example. (13)

14. (a) Briefly discuss about simplex method with an example. (13)

Or

(b) Briefly discuss about Stable marriage algorithm. (13)

15. (a) What is sum of subsets problem? How would you formulate this problem? Discuss its application. (13)

Or

(b) Discuss about approximation algorithms for NP-hard problems. (13)

PART C — ($1 \times 15 = 15$ marks)

16. (a) Apply Huffman Tree code to solve below dataset {A,B,C,D,E} and Values {0.17,0.11,0.24,0.33,0.25}. (15)

Or

(b) Write the binary search algorithm and analyze it for its worst-case behavior. Derive all the intermediate formulae that are used. (15)