Roll No. .....

3230

B. Tech. 5th Semester (CSE) Examination – December, 2022

DESIGN AND ANALYSIS OF ALGORITHMS

Paper : PCC-CSE-307-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Explain the following : 15

(a) What is algorithm ? Explain characteristics of algorithms.

(b) What is the time complexity of Merge sort and Selection sort ?

(c) Explain P and NP class.

(d) Explain Divide and Conquer technique.

(e) Explain Greedy algorithm.

(f) What is multistage graph ?

(g) Write the applications of Branch and Bound problem.

UNIT – I

2. (a) What is Stack ? Explain basic operations of stack and write algorithm of insert and delete. 8

(b) Define the time complexity. Explain asymptotic notation. 7

3. (a) Explain the procedure of Quick sort with an example. Also analyze it in best, average and worst case. 10

(b) Explain Binary Search with example. What is the complexity of binary search ? 5

UNIT – II

4. (a) Explain 0/1 Knapsack. 10

Solve using 0/1 Knapsack with capacity 20 :

Objects	OBJ1	OBJ2	OBJ3
Profit	25	24	15
Weight	18	15	10

(b) Explain Greedy algorithm. Write its applications. 5

5. (a) Define Dynamic programming. Explain travelling Sales man problem by taking suitable example. 10

(b) Write a short note on fractional knapsack problem. 5

UNIT – III

6. (a) Explain Backtracking with algorithm. 7

   (b) Define N-Queen problem and write all the steps to solve this. 8

7. (a) Discuss branch and bound strategy. 8

   (b) Explain Travelling Sales man problem using Branch and bound strategy. 7

UNIT – IV

8. (a) What is the relationship among P, NP and NP complete problems ? Show with the help of a diagram. 7

   (b) Differentiate between NP hard and NP complete problem. 8

9. Explain NP hard and NP completeness of SAT problem. 15
