Roll No. Total No. of Pages : 02

Total No. of Questions: 18

B.Tech. (CSE) (Sem.-5) DESIGN AND ANALYSIS OF ALGORITHMS

Subject Code: CS-307 M.Code: 56526

Time: 3 Hrs. Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly:

- 1) How is the time complexity measured?
- 2) What is dynamic programming?
- 3) What is a deterministic algorithm?
- 4) What do you mean by the running time of an algorithm?
- 5) What are P and NP problems?
- 6) What is the working principle of quicksort?
- 7) What are NP-complete algorithms?
- 8) What do you understand by Divide and Conquer strategy?
- 9) Are the sub solutions overlapping in dynamic programming approach?
- 10) What is the branch and bound technique?

1 M-56526 (S2)-2725

SECTION-B

- 11) Find the Big-OH notations for the following functions:
 - a) f(n) 78889

b)
$$f(n) = 6 n^2 + 135$$

c)
$$f(n) = 7 n^2 + 8n + 56$$

d)
$$f(n) = n^4 + 35n^2 + 84$$

- 12) What do you analyze in an algorithm? What is the basis of analysis? Explain
- 13) What are greedy algorithms? What are their characteristics? Explain any greedy algorithm with example.
- 14) Explain the KMP algorithm in detail with an illustrative example.
- 15) Write an algorithm to solve APSP problem.

SECTION-C

16) Consider five items along with their respective weights and values:

$$I = \langle il, i2, i3, i4, i5 \rangle$$

$$w = <5,10,20,30,40>$$

$$v = <30,20,100,90,160>$$

The capacity of the knapsack W = 60. Find the solution for the fractional knapsack problem.

- 17) What is the relationship among P, NP and NP complete problems? Show with the help of a diagram.
- 18) Compare the various programming paradigms such as divide-and-conquer, dynamic programming and greedy approach.

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

2 M-56526 (S2)-2725