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?

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 = <il, i2, i3, i4, i5>

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.