BT-5/D-20                    **45176**

## ADVANCED ALGORITHMS
Paper–PE-CS-T307A

Time : Three Hours]                    [Maximum Marks : 75

**Note :** Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

## UNIT–I

1.  (a)  What do you understand by an algorithm? Discuss the procedure to compute the time complexity of an algorithm.

    (b)  Differentiate between pseudo code and programming language code.

2.  What is recurrence relation? Explain the substitution and recursion tree method for solving recurrences. Solve the relation $T(n) = (A * T(n - 1)) + (B*T(n - 2)) + 1$, where A and B are constant.

## UNIT–II

3.  (a)  Differentiate between Dynamic Programming & Divide and Conquer.

    (b)  Solve the LCS problem with A = {ABCDGH}, B = {AEDFHR}.

**4.** (a) Explain the Knapsack problem with its types using suitable examples. Solve the Knapsack as {Profit = {4,2,1,2,10}, Weight = {12,2,1,1,4} & Capacity = 15} using Greedy approach.

(b) What are the basic elements of Greedy Algorithms? Explain the Activity selection problem in short.

## UNIT–III

**5.** (a) How is data stored in graph structure? Explain.

(b) Differentiate between Depth-First Search & Breadth-First Search.

**6.** (a) Discuss the procedure to find the shortest path in a graph. Explain with suitable examples.

(b) What are the merits of using Bellman-Ford algorithm for shortest path in a graph.

## UNIT–IV

**7.** (a) What is string matching problem? Discuss using suitable examples.

(b) Explain the string matching using finite automation using suitable examples.

**8.** Solve the string matching problem with Str={AABAACAADAABAABA} & pattern = {AABA} using Rabin-Karp algorithm.

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