-2023

Paper / Subject Code: 38912 / Analysis of Algorithm

S.E. Sem IV (C Scheme, R-2019) AIDS May 2023

(Time: 3 Hours) Total Marks: 80

N.B: (1) Question No. 1 is compulsory.

(2) Attempt any three from the remaining questions.

(3) Figures to the right indicate full marks.

1. Attempt any four

(A) Describe the relationship along P, NP, NP-hard, NP-complete? 5

(B) What is the difference between divide and conquer approach and dynamic programming? 5

(C) Explain Multistage graph with example. 5

(D) Write an abstract algorithm for greedy design method. 5

(E) What is Asymptotic analysis and define big Oh, big Omega and Theta notation? 5

2. (A) Sort the following numbers using Quick Sort. Also, derive the time complexity of Quick Sort. 50, 31, 71, 38, 77, 81, 12, 33. 10

(B) What is Knuth Morris Pratt Method of Pattern Matching? Give Examples. 10

3. (A) Solve the following instance of Job sequencing with deadlines problem n=7, profits (p1, p2, p3, p4, p5, p6, p7) = (3, 5, 20, 18, 1, 6, 30) and deadlines (d1, d2, d3, d4, d5, d6, d7) = (1, 3, 4, 3, 2, 1, 2). Schedule the jobs in such way so as to get maximum profit. 10

(B) Write and explain sum of subset algorithm for n = 5, W = {2, 7, 8, 9, 15} M = 17. 10

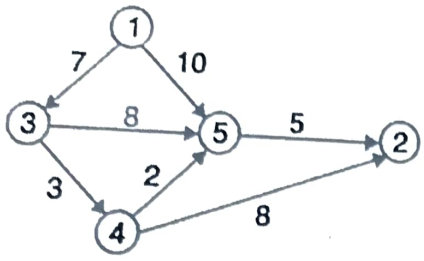
4. (A) Find Longest Common Subsequence for following strings 10

X = acbaed

Y = abcabe

(B) Write an algorithm to find the minimum and maximum value using divide and conquer and also derive its complexity. 10

5. (A) Find a minimum cost path from 3 to 2 in the given graph using dynamic programming. 10



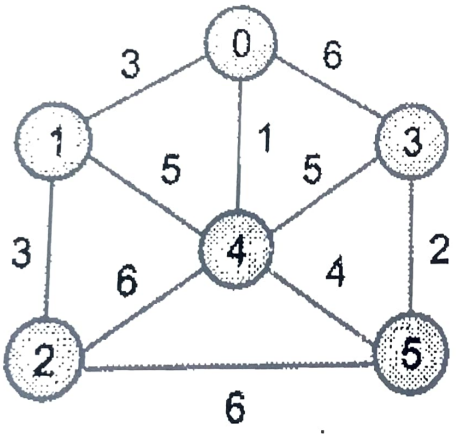
(B) Write an algorithm to solve N Queens problem. Show its working for N = 4. 10

6. Attempt any two 20

(A) Explain naïve string matching algorithm with example.

(B) Explain 0/1 knapsack problem using dynamic programming.

(C) To Find MST of following graph using prim's and kruskal's Algorithm.



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