

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - IV Computer Science & Engineering-AI & ML : WINTER : 2024
SUBJECT: ALGORITHMS ANALYSIS & DESIGN

Day : Monday
Date : 25/11/2024

W-23948-2024

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.

1. All questions are **COMPULSORY**.
2. Figures to the right indicate **FULL** marks.
3. Neat diagrams must be drawn **WHEREVER** necessary.
4. Assume suitable data, if necessary.

Q.1 Explain recurrences and various methods to solve recurrences? (10)

OR

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

Q.2 Explain with example how divide and conquer strategy is used in binary search algorithm? (10)

OR

Solve sum of subsets problem for following (10)
 $N=6$ $W=\{3,5,7,8,9,15\}$ & $M=20$ Also write the Algorithm for it.

Q.3 Write Kruskal's algorithm and show its working by taking suitable example of graph with 5 vertices. (10)

OR

Write algorithm for greedy knapsack and obtain the solution to following (10)
knapsack problem where $n=7$, $m=15$, $(p_1, p_2, \dots, p_7) = (10, 5, 15, 7, 6, 18, 3)$,
 $(w_1, w_2, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$.

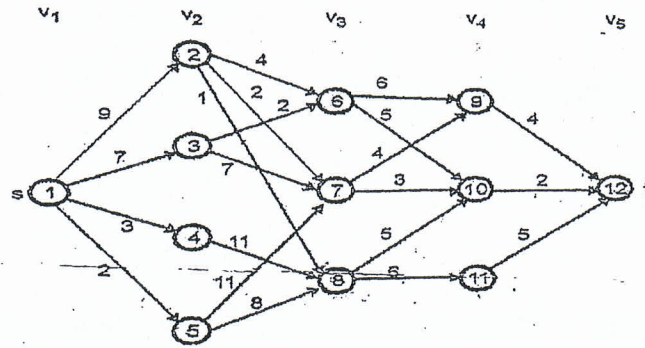
Q.4 Describe the Travelling sales person problem and discuss how to solve it using dynamic programming with example. (10)

P.T.O.

OR

Write multistage graph algorithm and solve following example.

(10)



Q.5 Rewrite and Compare Rabin Karp and Knuth Morris Pratt Algorithms. Give the pseudo code for the KMP string matching algorithm. (10)

OR

Obtain the solution to knapsack problem by Greedy method $N=7, M=15$ (p_1, p_2, \dots, p_7) = (10, 5, 15, 7, 6, 18, 3), (w_1, w_2, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1).

Q.6 What do you understand by NP Complete? Explain Is Subset sum problem NP complete? If so explain. (10)

OR

Prove that vertex cover problem is NP complete. (10)

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