

No Preview
Available

Total No. of Question : [4]

Registration No. :

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Programme Name : Bachelor of Computer Science Engineering

Regular T.Y.B.Tech. ESE (A.Y. 2023-24) Sem.V Nov.2023

V SEMESTER (2021 BATCH)

201CSL301-Design and Analysis of Algorithms(TH)

Duration : [11:00 AM - 01:00 PM]

Date : 20 Nov, 2023

Day : Monday

Marks : 50

Instructions :

(Q1) All questions are compulsory.

[20.0]

(1.1) Prove that complexity of Merge sort algorithm is $n \log n$.

[6.0]

CO :- C301.2

Blooms Taxonomy :- Apply

(1.2) Solve the Knapsack problem using $n=4$, weights are (10,15,6,9) and profits are (2,5,8,1) and capacity of Knapsack is 25.

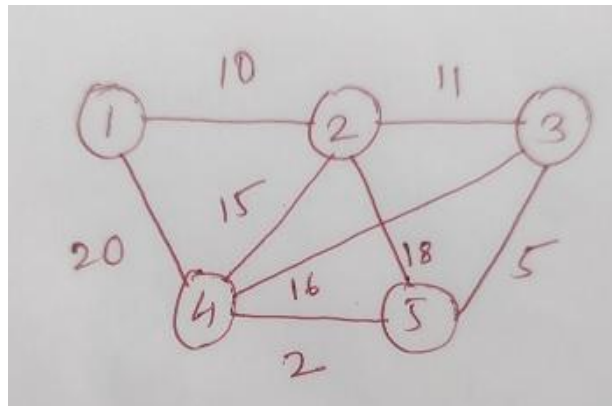
[3.0]

CO :- C301.1

Blooms Taxonomy :- Understand

(1.3) Define Spanning tree. Apply Prim's algorithm to find minimum cost spanning tree for the following graph.

[4.0]



CO :- C301.1

Blooms Taxonomy :- Understand

(1.4) Let $w[1:4]=\{4,3,5,2\}$, $m=7$. Find all possible subsets of w that sum equal to m . Draw portion of state space tree that is generated

[4.0]

CO :- C301.1

Blooms Taxonomy :- Understand

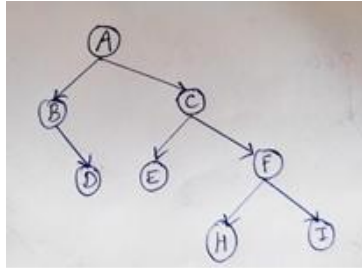
(1.5) Draw and explain permutation tree for 4 queen problem using backtracking [3.0]

CO :- C301.1

Blooms Taxonomy :- Understand

(Q2) All Questions are compulsory [10.0]

(2.1) Find the Preorder, Inorder, Postorder traversal for the following binary tree. [5.0]



CO :- C301.3

Blooms Taxonomy :- Apply

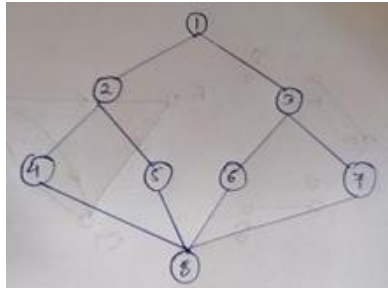
OR [2.1 / 2.2]

(2.2) Write an algorithm to convert non bi-connected graph into bi-connected graph and explain the method with an example [5.0]

CO :- C301.3

Blooms Taxonomy :- Apply

(2.3) Write an algorithm for BFS and obtain BFS spanning tree for the following graph [5.0]

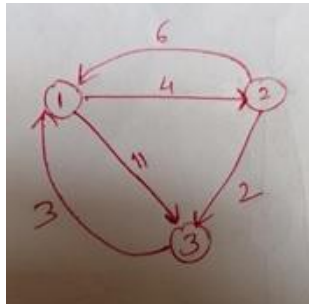


CO :- C301.3

Blooms Taxonomy :- Apply

(Q3) All Questions are compulsory [10.0]

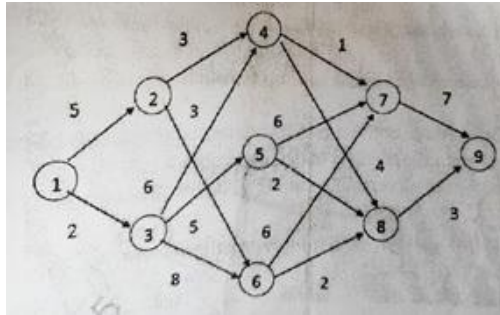
(3.1) Find the solution to all pairs shortest path problem using dynamic programming. [5.0]



CO :- C301.3

Blooms Taxonomy :- Apply

- (3.2) Apply dynamic programming method to find minimum cost of path from S-T in the multistage graph using forward approach of following graph [5.0]



CO :- C301.3

Blooms Taxonomy :- Apply

OR [3.2 / 3.3]

- (3.3) Explain Travelling Sales Person Problem using Dynamic Programming approach [5.0]

CO :- C301.3

Blooms Taxonomy :- Apply

(Q4) Attempt any two questions from following. [10.0]

- (4.1) Define the following terms: [5.0]

1. Decision Problem
2. P Problem
3. NP Problem
4. NP Hard
5. NP Complete

CO :- C301.4

Blooms Taxonomy :- Understand

- (4.2) What is node cover decision problem? Show that clique decision problem is reducible to node cover decision problem [5.0]

CO :- C301.4

Blooms Taxonomy :- Understand

- (4.3) What is Clique of a graph? Show that Clique Decision Problem is NP Hard graph Problem [5.0]

CO :- C301.4

Blooms Taxonomy :- Understand
