

Total No. of Question : [4]

Registration No. : 

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**Programme Name : Computer Science & Engineering(DS)**  
**Regular S.Y.B.Tech.Sem.IV ESE May / June 2023**  
**IV SEMESTER ( 2021 BATCH)**  
**201DSL212-Computer Algorithms**

Duration : 2 Hours

Marks : 50

Instructions :

(Q1) All Questions are compulsory

[20.0]

(1.1) What is an Algorithm? What are the characteristics of the algorithm?

[6.0]

CO :- C212.1

Blooms Taxonomy :- Understand

(1.2) Find the optimal solution for the fractional knapsack problem making use of greedy approach. Consider  $n = 5$ ,  $m = 60$   
 $(w_1, w_2, w_3, w_4, w_5) = (5, 10, 15, 22, 25)$   
 $(p_1, p_2, p_3, p_4, p_5) = (30, 40, 45, 77, 90)$

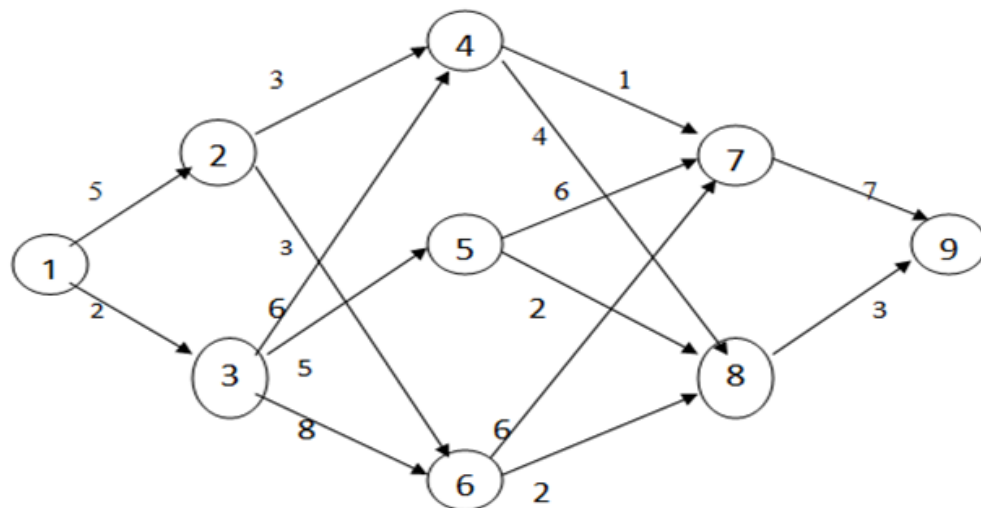
[6.0]

CO :- C212.1

Blooms Taxonomy :- Understand

(1.3) Find minimum cost of path from S-T in the multistage graph of following figure.

[8.0]



CO :- C212.1

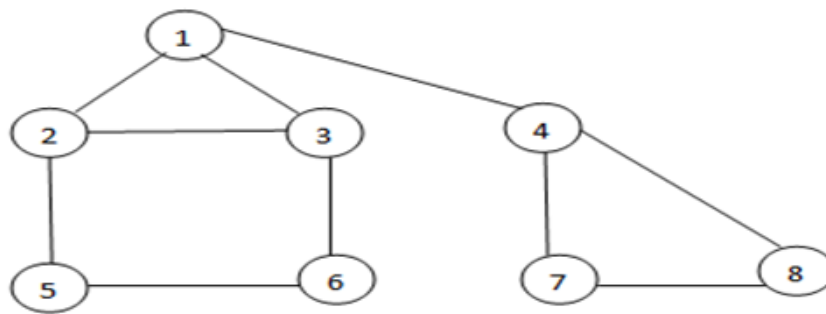
Blooms Taxonomy :- Understand

(Q2) All Questions are compulsory.

[10.0]

(2.1) Obtain BFS spanning tree for the following graph.

[5.0]



**CO :- C212.2**

**Blooms Taxonomy :- Apply**

(2.2) Explain Pre-order, In-order and Post-order traversal techniques for binary tree.

[5.0]

**CO :- C212.2**

**Blooms Taxonomy :- Apply**

**(Q3) All Questions are compulsory**

[10.0]

(3.1) Explain Graph Coloring using Backtracking and explain with sample example.

[5.0]

**CO :- C212.2**

**Blooms Taxonomy :- Apply**

(3.2) Explain backtracking solution to 4-Queens problem.

[5.0]

**CO :- C212.2**

**Blooms Taxonomy :- Apply**

**(Q4) Attempt any two out of three questions**

[10.0]

(4.1) What is P, NP , NP-complete and NP-Hard problems?

[5.0]

**CO :- C212.3**

**Blooms Taxonomy :- Understand**

(4.2) Explain relationships of P, NP , NP-complete and NP-Hard with neat diagram.

[5.0]

**CO :- C212.3**

**Blooms Taxonomy :- Understand**

(4.3) Differentiate between NP Complete and NH hard

[5.0]

**CO :- C212.3**

**Blooms Taxonomy :- Understand**

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