

Time (2 Hours)

Total Marks: 50

Note: 1.Question number Q1 is compulsory
2.Attempt any two questions out of Q2 to Q5

Marks	Course Outcome CO	Bloom's Level BL
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Q1 Answer the following

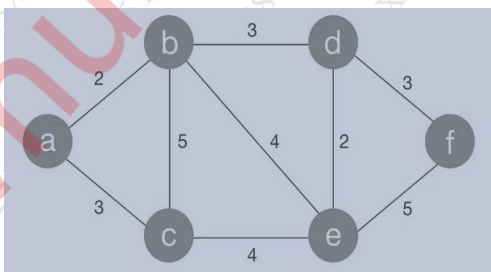
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|----|---|------|-----|-----|
| a. | What do you mean by Recursive and Non-recursive algorithms? Explain mathematical analysis by giving a suitable example. | [05] | CO1 | BL4 |
| b. | Explain DFS with a suitable example. | [05] | CO2 | BL2 |
| c. | Differentiate between branch-and-bound and backtracking techniques. | [05] | CO3 | BL1 |
| d. | Write down the applications of string matching algorithms. | [05] | CO4 | BL2 |

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|-----------|----|--|------|-----|-----|
| Q2 | a. | What do you mean by the divide and conquer approach? How are convex hull problems solved using the divide and conquer approach? Explain with an example. | [08] | CO1 | BL3 |
| | b. | Explain the least-cost search branch and bound technique and how it is used to solve the given 15-puzzle problem using the LCS branch and bound technique. | [07] | CO3 | BL4 |

1	2	3	4
5	6		8
9	10	7	11
13	14	15	12

Given arrangement

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|-----------|----|---|------|-----|-----|
| Q3 | a. | What do you mean by greedy technique? Find the Minimum cost spanning tree by applying the Prim's algorithm for the given graph. | [08] | CO2 | BL4 |
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|----|--|------|-----|-----|
| b. | What do you mean by Finite automata? Write notes on the different types of DFA & N DFA. Write an example of how to convert N DFA to DFA. | [07] | CO4 | BL2 |
|----|--|------|-----|-----|

- Q4**
- a. What is the backtracking technique? Explain with an example how the Hamiltonian cycle is solved using backtracking by drawing its state space tree. [08] CO3 BL4
- b. Write do you mean by bad character in the Boyer Moore string matching algorithm, and explain how the given problem is solved using it. [07] CO4 BL3
Text: WELCOMETOTEAMMATE
Pattern: TEAMMATE
- Q5**
- a. What do you mean by the Dynamic Programming approach? Solve the given Longest common subsequence problem using the dynamic programming technique. [08] CO2 BL3
X = "AGGTAB"
Y = "GXTXAYB"
- b. Write an algorithm to sort an array using merge sort; also write its recurrence relation and solve it to find time complexity using the substitution method. [07] CO1 BL4
