

(3 Hours)

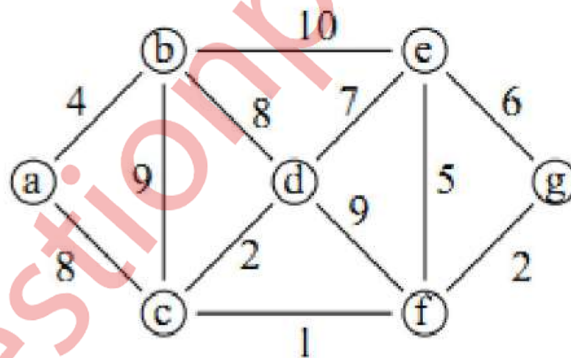
[Total Marks: 80]

Note:

1. Question No: 01 is compulsory.
2. Attempt any three questions from the remaining five questions (Q. 2 to Q. 6).
3. Figures to the right indicate full marks.
4. Answers to sub questions should be answered together.

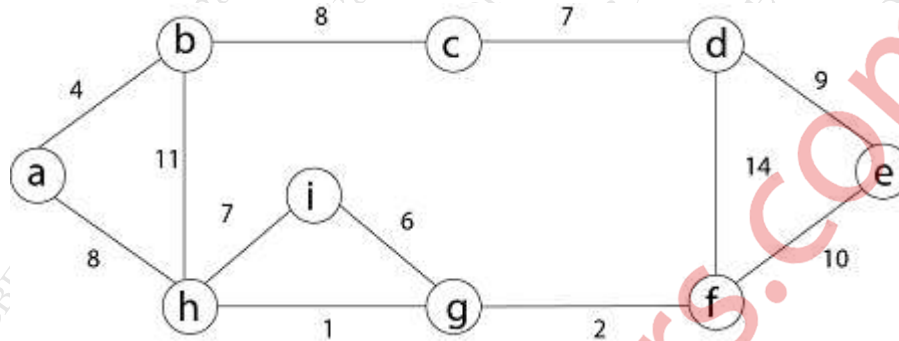
- Q1 A) List and explain the characteristic properties associated with a problem that can be solved using dynamic programming. Give the algorithm for matrix chain multiplication and state the time complexity of the algorithm. **10**
- B) What is divide and conquer technique? Write quick sort algorithm and apply it to 45, 32, 11, 56, 77, 90, 41, 62, 99, 22, 88. **10**

- Q2 A) Write down Prim's algorithm and analyze the complexity. Apply Prim's algorithm on the graph given below. **10**



- B) Device backtracking algorithm to find all solutions to the Graph coloring problem and represent the solution space in state space tree. **10**
- Q3 A) What do you understand by NP Hard and NP complete problems also differentiate between NP Hard and NP complete problems. **10**
- B) What is dynamic programming? How it is applied to the Longest Common Subsequence. Perform the Longest Common Subsequence for the following strings –
 S1 = "AGGTAB" and S2 = "GXTXAYB". **10**

- Q4 A) Specify the difference between divide and conquer strategy and dynamic programming. How divide and conquer strategy is applied to Binary Search algorithm. **10**
- B) Find the Minimum Spanning Tree of the following graph using Kruskal's algorithm. **10**



- Q5 A) What do you mean by Branch and Bound technique? Explain LIFO Search, FIFO search and least cost search with examples. **10**
- B) Compare and contrast Recursive and Non-recursive algorithms. Also analyze and solve the recurrence relation for binary search. **10**
- Q6 A) Knutt-Morris-Pratt algorithm **05**
- B) Asymptotic Notations and their properties **05**
- C) Boyer Moore algorithm **05**
- D) Rabin-Karp algorithm **05**
