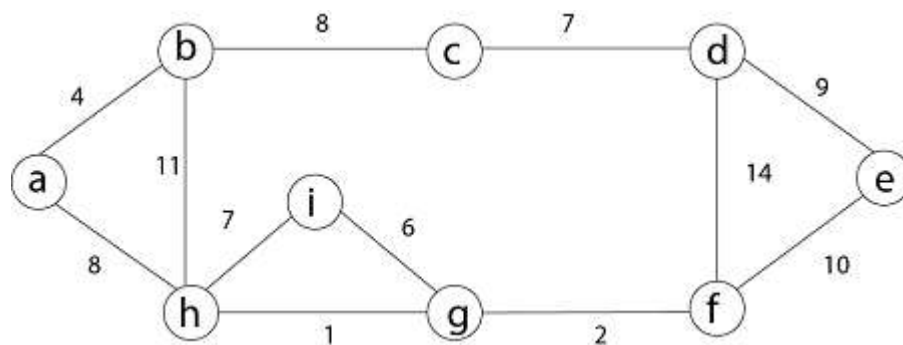


Note:

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) Write a detailed Comparative analysis of Quick sort and Merge sort using divide and conquer approach on a given array – 10
 15, 21, 8, 9, 18, 5, 8, 11, 14, 3
- B) What is Dynamic Programming? Write an algorithm to solve all pair shortest path (Floyd Warshall) using Dynamic Programming with an example. 10

- Q2 A) Find the Minimum Spanning Tree of the following graph using Kruskal's algorithm. 10



- B) Differentiate between Boyer Moore algorithm and Rabin-Karp algorithm with example of string matching. 10
- Q3 A) What do you mean by Branch and Bound technique? Explain LIFO Search, FIFO search and least cost search with examples.
- B) What is divide and conquer algorithms? Explain and write steps to solve following array elements using Heap sort –
 array = [45, 12, 23, 89, 34, 67, 10, 55].
- Q4 A) Device backtracking algorithm to find all solutions to the Graph colouring problem and represent the solution space in state space tree. 10

- B) Solve given 0/1 Knapsack problem using dynamic programming approach. The maximum weight the knapsack can hold is W is 11. There are five items to choose from. Their weights and values are presented in the following table:

$W_1=1$ $V_1=1$

$W_2=2$ $V_2=6$

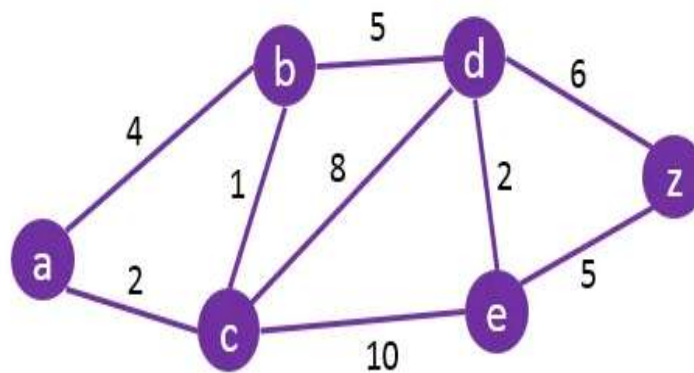
$W_3=5$ $V_3=18$

$W_4=6$ $V_4=22$

$W_5=7$ $V_5=28$

- Q5 A) What is analysis of algorithm? How it will be used for recursive algorithms? Solve the recurrence relation for merge sort. 10

- B) What are Greedy algorithms? Explain the advantages of greedy algorithm. Also, find the shortest path to travel between A to Z. 10



- Q6 A) Perform the Longest Common Subsequence for the following. 05

String1: ABCBDAB &

String2: BDCABA

- B) What is approximation algorithm and explain natural algorithms 05
- C) What are asymptotic notations and their properties. 05
- D) Differentiate between NP Hard and NP complete problems with examples. 05
