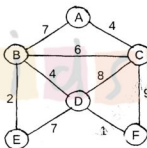


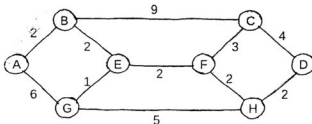
N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of remaining five questions.

- Q1. a) Explain the asymptotic notations. [10]  
 b) Write an algorithm to find minimum and maximum value using divide and conquer and also derive its complexity. [10]
- Q2. a) Explain the concept of multiplying long integers using divide and conquer. [10]  
 b) Sort the following numbers using Quick Sort. Also derive the time complexity of Quick Sort. [10]  
 50, 31, 71, 38, 77, 81, 12, 33
- Q3. a) Solve the following Job sequencing with deadlines problem [10]  
 $n=7$ , Profits( $p_1, p_2, \dots, p_7$ ) = {3, 5, 20, 18, 1, 6, 30}  
 Deadlines( $d_1, d_2, \dots, d_7$ ) = {1, 3, 4, 3, 2, 1, 2}  
 b) Explain different string matching algorithms. [10]
- Q4. a) Find the Minimum Spanning Tree of the following graph using Kruskal's algorithm [10]



- b) Explain flow shop scheduling with example. [10]
- Q5. a) Write an algorithm for sum of subsets. Solve the following problem. [10]  
 $M=30$   $W=\{5, 10, 12, 13, 15, 18\}$   
 b) Find the shortest path from source vertex A using Dijkstra's algorithm [10]



- Q6. Write note on (any two): [20]  
 a) Strassen's matrix multiplication.  
 b) 8-Queen problem.  
 c) Graph coloring  
 d) 15-puzzle problem.