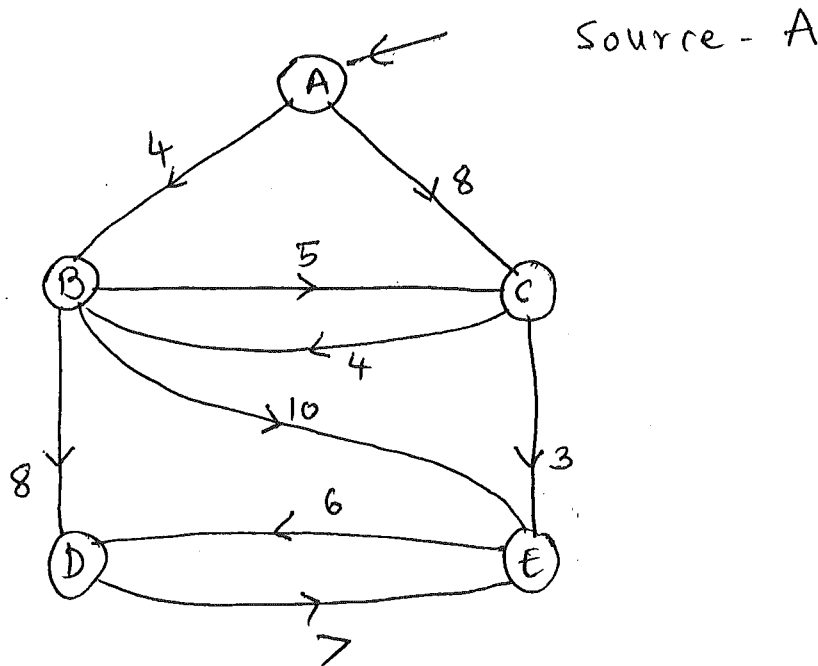


N.B. (1) Question No. 1 is compulsory.

(2) Attempt any **four** questions out of remaining **six** questions.

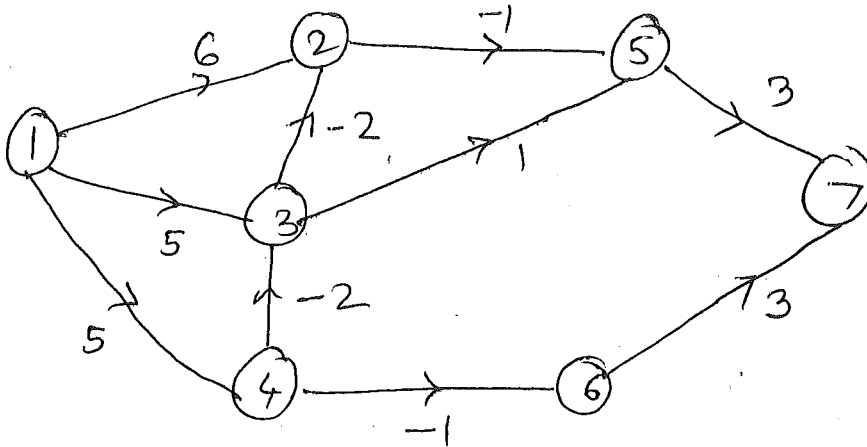
(3) Assume **suitable** data wherever **necessary**.

1. (a) Explain Divide and Conquer strategy. Write control abstraction (General method) for it. List any Four examples that can be solved by divide and conquer. **10**
- (b) Explain Asymptotic notations. Explain time complexity and space complexity in detail. **10**
2. (a) Explain Graph coloring problem using backtracking. Write algorithm for same. **10**
- (b) Find out single source shortest path for following graph using Dijkstra's algorithm. **10**



3. (a) Find the longest common subsequence from the given two sequences :- **10**
 $P = (100101101101)$
 $Q = (0110)$
- (b) Explain 15-puzzle problem using branch and bound. **10**
4. (a) Sort following numbers using Quicksort algorithm. Show all passes of execution. **10**
 Also state the time complexity.
 65, 70, 75, 80, 85, 60, 55, 50, 45
- (b) Explain and write Knuth -Morris Pratt algorithm. Explain with an example. **10**
5. (a) Explain job-sequencing with deadlines. Solve the following instance : **10**
 $n = 5.$
 $(P_1, P_2, P_3, P_4, P_5) = (20, 15, 10, 5, 1)$
 $(d_1, d_2, d_3, d_4, d_5) = (2, 2, 1, 3, 3)$
- (b) Solve following sum of subset problem using backtracking : **10**
 $w = \{ 1, 3, 4, 5 \}$
 $m = 8$
 Find all possible subsets of 'w' that sum to 'm'.

6. (a) Solve shortest path from source 1 for following graph using dynamic programming. 10



(b) Explain travelling salesperson problem using branch and bound method. 10

7. Write short notes :- 20

- (a) Differentiate between greedy approach and dynamic programming.
 - (b) Optimal storage on tapes.
 - (c) Radix sort
 - (d) Minimum spanning Tree using Kruskal's Algorithm.
-