D : PH (April Exam) 273

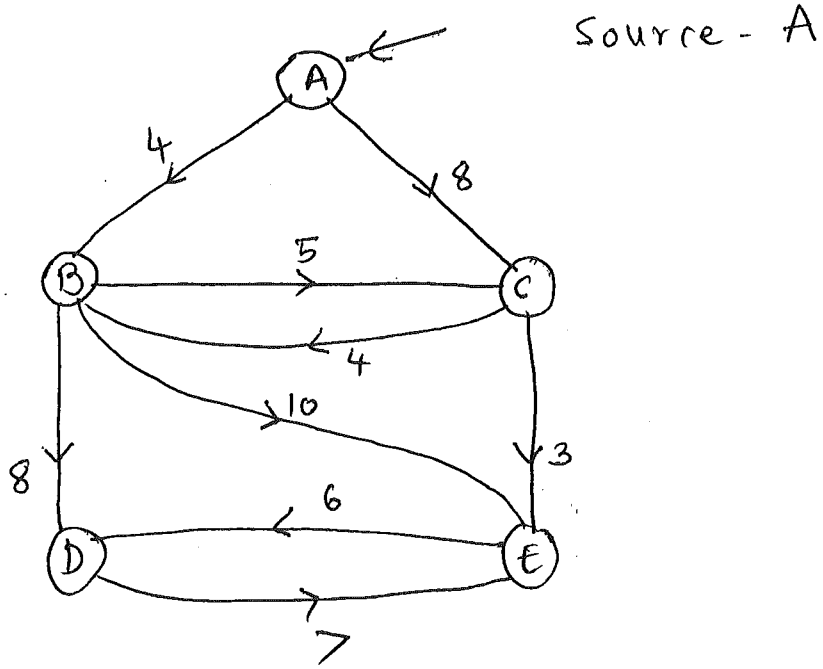
Con. 6646-13. **GS-7323**

(3 Hours) **[Total Marks : 100**

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**



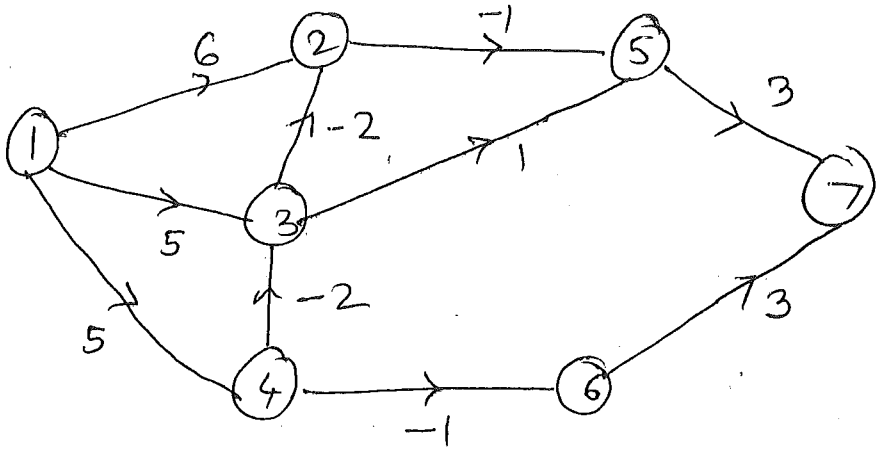
3. (a) Find the longest common subsequence from the given two sequences :– **10**
   P = (100101101101)
   Q = (0110)
   (b) Explain 15-puzzle problem using branch and bound. **10**

4. (a) Sort following numbers using Quicksort algorithm. Show all passes of execution. Also state the time complexity. **10**
   65, 70, 75, 80, 85, 60, 55, 50, 45
   (b) Explain and write Knunth –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'.

[TURN OVER

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.
