East West University

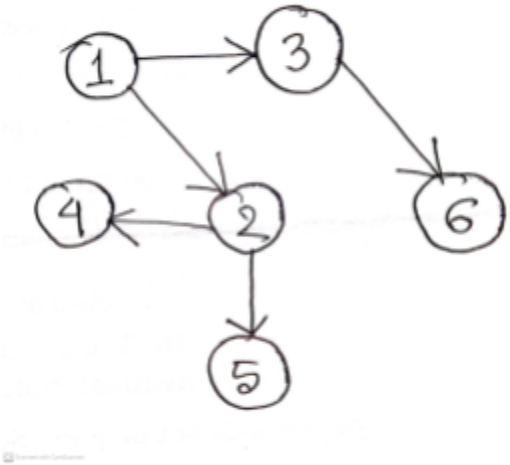
Department of Computer Science and Engineering

Course: CSE246 (Algorithm)

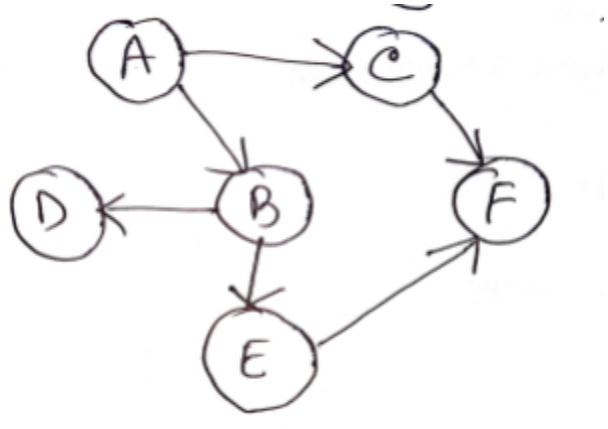
Section:11

Lab Test Examination

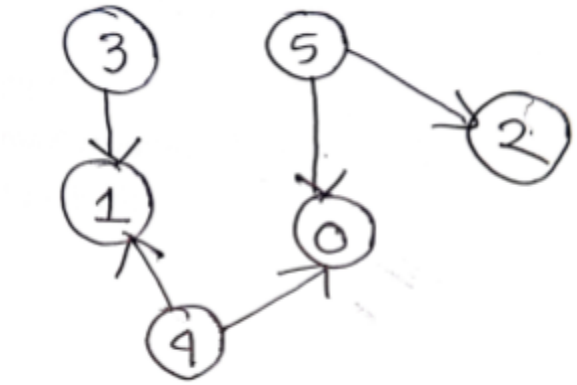
1.

Input	Output
Write a program to perform **Breadth-First Search** on the following graph:  **Starting Node: 1**	**BFS Traversal: [1, 2, 3, 4, 5, 6]**

2.

Input	Output
Write a program to perform **Depth-First Search** on the following graph: **Starting Node: A**  	**DFS Traversal: [A B D E F C]**

3.

Input	Output
Write a program to compute a valid topological ordering of the vertices in the following Directed Acyclic Graph (DAG):  	**Topological Order: `[5, 4, 3, 2, 1, 0]`**

4.

Input	Output
Write a program to implement the **Binary Search algorithm**. Use the following input: Array: `[1, 3, 5, 7, 9, 11, 13]` **`Target: 7`**	Index of Target: 3

5.

Input	Output
Write a program to implement the **Quick Sort** algorithm on the following array: Array: `[8, 3, 1, 7, 0, 10, 2]`	Sorted Array: `[0, 1, 2, 3, 7, 8, 10]`

6.

Input	Output
Write a program to implement the **Merge Sort** algorithm on the following array: Array: `[12, 11, 13, 5, 6, 7]`	Sorted Array: `[5, 6, 7, 11, 12, 13]`

7.

Input	Output
Implement the **0/1 Knapsack algorithm** to solve the following problem: ● Weights: `[2, 3, 4, 5]` ● Values: `[3, 4, 5, 6]` ● Knapsack Capacity: 5 Your program should calculate the maximum value that can be achieved.	Maximum Value: 7

8.

Input	Output
Write a program to find the length of the **Longest Common Subsequence (LCS)** for the following strings: ● String 1: `"AGGTAB"` ● String 2: `"GXTXAYB"` Output the length of the LCS.	LCS Length: 4

9.

Input	Output
Write a program to solve the **Coin Change problem using Dynamic Programming**. Use the following inputs: ● Coin Denominations: `[1, 2, 5]` ● **Target Amount: 11** Your program should calculate the minimum number of coins needed to make the target amount. Display the coins used in the solution.	Minimum Coins: 3 (e.g., `[5, 5, 1]`)

10.

Input	Output
Write a program to implement **Dijkstra's algorithm** for finding the shortest path in the **Graph**: `{ 0: [(1, 4), (2, 1)], 1: [(3, 1)], 2: [(1, 2), (3, 5)], 3: [] }` **Source Node**: `0`	Shortest distances: {0: 0, 1: 3, 2: 1, 3: 4}

11.

Input	Output
Write a program to solve the **Coin Change problem using the Greedy method**. Use the following inputs: ● Coin Denominations: `[1, 2, 5]` ● Target Amount: 11 Your program should output the coins used to make the target amount.	Coins Used: `[5, 5, 1]`