

CHAPTER

3

Graphs

Syllabus Topics

Introduction to Graphs : Undirected Graph, Directed Graph, graph terminology, Connectivity in Undirected and Directed Graphs. Spanning tree. Representation of graph: adjacency matrix, adjacency list, Transitive closure of a directed graph and path matrix.

Traversals : Breadth First Search, Depth First Search.

Self-learning Topics : Implementation of BFS, DFS.

3.1	INTRODUCTION TO GRAPHS	3-3
UQ. 3.1.1	What is Data structure for Graphs ? Explain. (MU - Dec. 13, 3 Marks).....	3-3
UQ. 3.1.2	Define Graph. (MU - May 14, Dec. 14, May 15, Dec. 15, May 17, Dec. 17, Dec. 18, Dec. 19, 1 Mark).....	3-3
UQ. 3.1.3	What is Graph ? (MU - May 14, 1 Mark).....	3-3
3.2	GRAPH TERMINOLOGY : UNDIRECTED GRAPH, DIRECTED GRAPH.....	3-4
UQ. 3.2.1	List types of Graph. (MU - May 14, May 15, Dec.15, May 17, 2 Marks).....	3-4
UQ. 3.2.2	List the types of graph with examples. (MU - Dec. 18, 2 Marks).....	3-4
UQ. 3.2.5	Explain in brief : Directed Graph. (MU - Dec. 13, 1 Mark)	3-4
UQ. 3.2.8	Explain in brief : Weighted Graph. (MU - Dec. 13, 1 Mark)	3-5
3.3	CONNECTIVITY IN UNDIRECTED AND DIRECTED GRAPHS.....	3-6
3.3.1	Connected Vertices and Graphs	3-6
3.4	SPANNING TREE.....	3-7
3.5	REPRESENTATION OF GRAPH	3-7
UQ. 3.5.1	Explain representation of graph with example. (MU - May 14, 7 Marks).....	3-7
UQ. 3.5.2	Which are the methods to represent a graph ? (MU - Dec. 14, Dec. 17, 3 Marks).....	3-7
3.5.1	Adjacency Matrix (Array Representation).....	3-7
UQ. 3.5.4	Explain in brief : Adjacency Matrix Representation (MU - Dec. 13, 1 Mark).....	3-7



3.5.2	Adjacency List (Linked List Representation)	3-9
UQ. 3.5.5	Explain in brief : Adjacency List Representation (MU - Dec. 13, 1 Mark)	3-9
3.6	TRANSITIVE CLOSURE OF A DIRECTED GRAPH	3-13
3.7	PATH MATRIX	3-14
3.8	GRAPH TRAVERSALS	3-15
3.8.1	Breadth First Search (BFS)	3-15
UQ. 3.8.2	Explain BFS with example. (MU - May 14, Dec. 17, 5 Marks)	3-15
UQ. 3.8.3	Write short note on : BFS. (MU - May 16, Dec.19, 5 Marks)	3-15
UQ. 3.8.4	Solve : BFS : Breadth First Search (MU - May 17, 5 Marks)	3-15
UQ. 3.8.5	Explain BFS algorithm with example. (MU - May 18, May 19, 5 Marks)	3-15
3.8.1(A)	Algorithm of BFS Traversal of Graph	3-16
UQ. 3.8.6	Write an algorithm for Breadth First Search. Traversal of a Graph. (MU - May 15, Dec. 15, Dec. 16, 5 Marks)	3-16
3.8.2	Depth First Search (DFS)	3-18
UQ. 3.8.9	Explain DFS with example. (MU - May 14, Dec. 17, 5 Marks.	3-18
UQ. 3.8.10	Write short note on : DFS. (MU - May 16, Dec. 19, 5 Marks)	3-18
UQ. 3.8.11	Explain DFS algorithm with example. (MU - May 18, May 19, 5 Marks)	3-18
3.8.2(A)	Recursive Algorithm of Depth First Search (DFS)	3-18
UQ. 3.8.12	Write an algorithm for DFS traversal. (MU - Dec. 14, 3 Marks)	3-18
3.8.2(B)	Algorithm of Non-Recursive DFS	3-18
UQ. 3.8.13	Write algorithm of DFS. (MU - May 15, Dec. 15, Dec. 16, 5 Marks)	3-18
3.9	IMPLEMENTATION OF BFS	3-22
3.10	IMPLEMENTATION OF DFS	3-24
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3.10.2	Program on DFS using Adjacency List	3-25
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3.12	DIFFERENTIATE BETWEEN TREE AND GRAPH	3-27
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