K. J. Somaiya Institute of ~~Engineering and Information~~ Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Subject Code: EXDLC5054   Subject Name: Data Structures and Algorithms   Date: 05/06/2023

MAY- June 2023

(B.Tech)Program: Electronics and Telecommunication Engineering
Examination: TY   Semester: V

Course Code: EXDLC5054   and   Course Name: Data Structures and Algorithms
Duration: 2.5 Hours   Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

Q. No	Question	Max. Marks	CO	BT Level
Q 1	**Solve any six questions out of eight:**	**12**		
i)	What are Data Structures , explain different types of data structures.		1	U
ii)	Explain Array Implementation of Stack		2	U
iii)	Explain various operations on Queue		2	U
iv)	Compare Linked List and Array		3	U
v)	Discuss Operations on Singly Linked List and Doubly Linked List		3	U
vi)	Explain the Binary Tree Representation, Types of Binary Tree		4	U
vii)	Discuss Sequential Search method.		5	U
viii)	Explain concept of all pair shortest path algorithm		6	U
Q.2	**Solve any four questions out of six.**	**16**		
i)	Explain Stack as an ADT, and Stack operation		2	U
ii)	What is an AVL tree. Construct an AVL tree by inserting the following elements in the given order. : 63, 9, 19, 27, 18, 108, 99, 81		4	Ap
iii)	List and explain Doubly Linked List Application		3	U
iv)	Create Minimum Spanning Tree using Prim Algorithm. Explain Spanning Tree concept		4	Ap
v)	Explain Hashing-Concept, Collision resolution Techniques		5	U
vi)	Explain Single source shortest path, Bellman Ford Algorithm		6	U

Subject Code: EXDLC5054   Subject Name: Data Structures and Algorithms   Date: 05/06/2023

Q.3	**Solve any two questions out of three.**	16	
i)	Explain the Linked Representation of Queue and with example explain Circular Queue	3	U
ii)	Explain Merge Sort algorithm, Discuss with an example.	5	An
iii)	Outline the Graph traversal (DFS & BFS) also explain BSF in brief with a proper solved example. Create a Tree from given Pre order and Post order: pre [ ] = {1, 2, 4, 8, 9, 5, 3, 6, 7} and post[ ] = {8, 9, 4, 5, 2, 6, 7, 3, 1}	4	U

Q.4	**Solve any two questions out of three.**	16	
i)	Analyze the 0/1 knapsack problem	6	An
ii)	Explain Asymptotic Analysis- Big O, Omega ,Big Theta notation	1	U
iii)	Explain Polish Notation-Infix, Post Fix and Pre fix. Discuss the Algorithm used for infix to postfix conversion For the given prefix expression : * - A / B C - / A K L convert it to postfix expression.	2	Ap

****