

**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: 12/12/2022

Nov – Dec 2022

(B.Tech )Program: Electronics and Telecommunication Engineering

Examination: TY    Semester: V

Course Code: EXDLC5054

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
<b>Q 1</b>	<b>Solve any six questions out of eight:</b>	<b>12</b>		
i)	Explain the term data Structures and give classification of Data Structure with example.		1	R
ii)	Explain Stack as an ADT, and Stack operation.		2	R
iii)	Define a double ended queue and give its applications.		2	R
iv)	What are the advantages of Linked List over Array?		3	R
v)	What is a doubly linked list? Explain insert operation in doubly linked list.		3	R
vi)	What is an expression tree? Give its examples.		4	R
vii)	Explain concept of all pair shortest path algorithm		6	R
viii)	Differentiate between sequential search and Binary search.		5	R
<b>Q.2</b>	<b>Solve any four questions out of six.</b>	<b>16</b>		
i)	Explain Performance characteristics of an algorithm.		1	U
ii)	Consider the infix string: $((A + B) * (C - D)) / E$ . Convert it to postfix form.		2	U
iii)	Explain various applications on linked lists.		3	U
iv)	Write an algorithm to search a node in BST.		4	
v)	What are various common hashing functions? List them with examples for each one.		5	
vi)	Write short note on Dijkstra's Algorithm		6	U

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**Q.3 Solve any two questions out of three.**

16

- i) Explain in detail the Asymptotic Analysis and Notations in data structure. 1    U
- ii) Explain Huffman Encoding with suitable example. 4    U
- iii) Explain Indexed Sequential Search with suitable example. What are advantages & disadvantages of Indexed Sequential Search? 5    U

**Q.4 Solve any two questions out of three.**

16

- i) Write an algorithm to evaluate the postfix expression. Evaluate the following postfix expression:  
6, 2, 3, +, -, 3, 8, 2, +, +, \*, 2, ^, 3, + 2    3
- ii) Write an algorithm to insert a new node at the end of a non-empty singly linked list. 3    U
- iii) Explain Floyd Warshall Algorithm with suitable example. 6    U

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