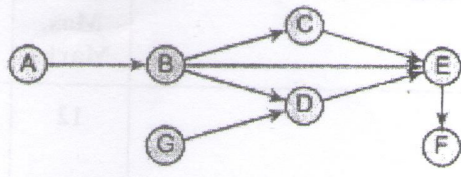
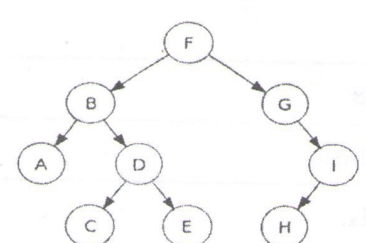
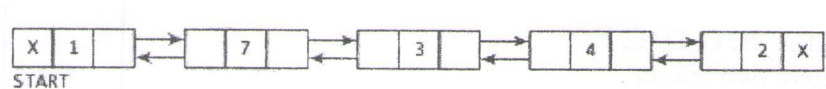


Jan 2023				
(B.Tech) Program: Artificial Intelligence and Data Science				
Examination: DSY Semester: III				
Course Code: AIC303 and Course Name: DATA STRUCTURE				
Duration: 2.5 Hours			Max. Marks: 60	
Instructions:				
(1) All questions are compulsory.				
(2) Draw neat diagrams wherever applicable.				
(3) Assume suitable data, if necessary.				
		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Explain the term Data Structure.	2	CO1	U
ii)	Explain well-formed ness of parenthesis using example	2	CO2	U
iii)	Differentiate between singly linked list and array	2	CO3	U
iv)	Draw a binary search tree for given numbers 50, 54, 41, 12, 25, 21, 83,33	2	CO4	Ap
v)	How are graphs represented inside a computer's memory?	2	CO5	U
vi)	Discuss the concept of AVL trees	2	CO4	U
vii)	Differentiate between DFS and BFS	2	CO5	U
viii)	Explain the chaining concept of collision	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	Explain the primitive and non-primitive data structures	4	CO1	U
ii)	Draw the stack structure in each case when the following operations are performed on an empty stack. (a) Add A, B, C, D, E, F (b) Delete two letters (c) Add G (d) Add H (e) Delete four letters (f) Add I	4	C02	Ap

iii)	Write an algorithm to implement a singly linked list with the following operations a) Insert a node in the beginning b) Delete a node from the end	4	CO3	U
iv)	Explain the concept of B tree with an example	4	CO4	U
v)	Consider a directed acyclic graph G given below  <p style="text-align: right;">Adjacency lists A: B B: C, D, E C: E D: E E: F G: D</p> Find a topological sort T of G.	4	CO5	Ap
vi)	What is collision? Explain any two techniques to resolve a collision	4	CO6	U
Q.3	Solve any two questions out of three.	16		
i)	Write the algorithm and find the in-order, pre-order, and post-order traversal for the following tree 	8	CO4	Ap
ii)	Write an algorithm to perform the enqueue and dequeue operations in a queue. Give suitable example.	8	CO2	U
iii)	Consider a doubly linked list shown below  Insert a new node with value 5 at the beginning of the list Insert a new node with value 9 after node with value 3. Show step wise insertion	8	CO3	Ap

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

Subject Code: AIC303

Subject Name: DATA STRUCTURE

Date: 30/01/2023

Q.4	Solve any two questions out of three.	16		
i)	Consider a hash table with size = 10. Using linear probing, insert the keys 27, 72, 63, 42, 36, 18, 29, and 101 into the table.	8	CO6	Ap
ii)	Insert the following elements in an AVL tree. 25, 44, 58, 15, 19, 11, 37, 32. Mention different rotations that can be used.	8	CO4	Ap
iii)	Create a Huffman tree with the following data A 7 B 9 C 11 D 14 E 18 F 21 G 27 H 29 I 35 J 40	8	CO4	Ap
