University of Mumbai
Examinations Summer 2022
Program: Electronics and telecommunication Engineering
Curriculum Scheme: Rev2019(C-scheme)
Examination: TE Semester V (Choice based credit grading system)
Course Code: 32228 and Course Name: Data structure and algorithm.

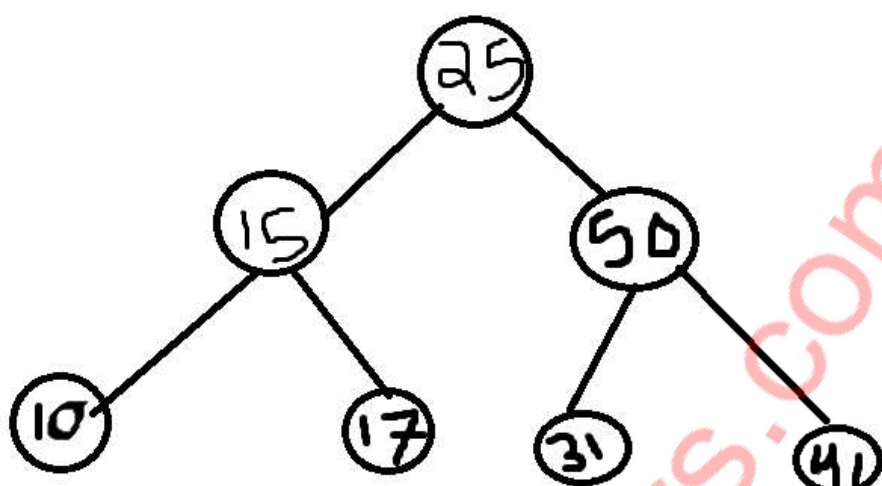Time: 2 hour 30 minutes   Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	What data structure can be used to check if syntax has balanced parenthesis?
Option A:	Stack
Option B:	Queue
Option C:	Tree
Option D:	Graph
2.	What is value of top variable when stack empty
Option A:	1
Option B:	-1
Option C:	0
Option D:	Null
3.	Each node in a singly linked list must contain -------- Fields.
Option A:	Three fields
Option B:	Two fields
Option C:	Four fields
Option D:	Five fields
4.	What is value of front variable when simple queue is empty
Option A:	-1
Option B:	1
Option C:	0
Option D:	Null
5.	Identify the right traversal order for post order traversal
Option A:	LEFT-NODE-RIGHT
Option B:	RIGHT-LEFT-NODE
Option C:	LEFT-RIGHT-NODE
Option D:	NODE-LEFT-RIGHT
6.	Which of the following is a non- linear data structure
Option A:	Arrays
Option B:	Stack
Option C:	Queue
Option D:	Trees
7.	What will be postfix of following infix expression: (9*7)+(6-2)
Option A:	9 7 * 6 2 + -
Option B:	9 7 * 6 2 - +
Option C:	9 +7 * 6 2 -
Option D:	9 7 * 6- 2 +

8.	Breadth First Search is used in
Option A:	Binary trees
Option B:	Graphs
Option C:	Stack
Option D:	None of the above
9.	Which sorting algorithm works on Divide and Conquer Technique
Option A:	Bubble sort
Option B:	Modified bubble sort
Option C:	Selection sort
Option D:	Merge sort
10.	Which one is the most desirable out of these traits of a hash function?
Option A:	It must cause more collisions
Option B:	It must be easy to implement
Option C:	It must cause less collisions
Option D:	It must occupy less space

Q2	Solve any Four out of Six 5 marks each
A	Define Data Structures and list operations of Data structures.
B	Define Linear queue with its operations.
C	Explain Performance Characteristics of an algorithm.
D	Draw the Expression tree for the following Z=(A*B) + (C/D)
E	Differentiate between linked list and array?
F	Define Hashing and explain any Two hashing functions.

Q3	Solve any Two out of Three 10 marks each
A	Sort the given list of numbers using quick sort. Show step by step procedure 14,33,27,57,100,12.
B	Write a program to implement stack using array. In which specify push, pop operation with full or empty condition.
C	Apply Huffman coding for the word 'MALAYALAM'. Give the Huffman code for each symbol.

Q4	
A	Solve any Two 5 marks each
i.	Differentiate between linear search and binary search
ii.	What is stack and write any four applications of Stack
iii.	Explain priority queue and double ended queue.

B	**Solve any One**	**10 mark each**
i.	Explain Depth First Search technique of graph with example in detail	
ii.	Write the In-order, preorder and post-order traversals for the following tree 	