

# 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

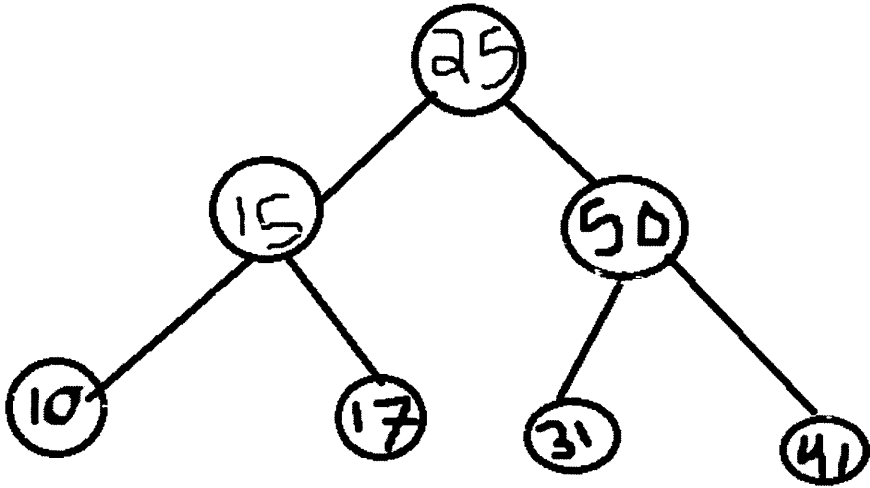
<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	What data structure can be used to check if syntax has balanced parenthesis?
Option A:	Stack
Option B:	Queue
Option C:	Tree
Option D:	Graph
2.	What is value of top variable when 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

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
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.	

<b>Q3</b>	<b>Solve any Two out of Three</b>	<b>10 marks each</b>
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.	

<b>Q4</b>		
<b>A</b>	<b>Solve any Two</b>	<b>5 marks each</b>
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 <span style="float: right;">10 mark each</span>
i.	Explain Depth First Search technique of graph with example in detail
ii.	<p>Write the In-order, preorder and post-order traversals for the following tree</p>  <pre> graph TD     25((25)) --- 15((15))     25 --- 50((50))     15 --- 10((10))     15 --- 17((17))     50 --- 31((31))     50 --- 41((41)) </pre>