TED (21) 4133
(Revision – 2021)

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Reg. No……………………
Signature ………………….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2023

DATA STRUCTURES

[Maximum Marks: **75**]   [Time: **3** Hours]

PART-A
I. Answer *all* the following questions in one word or one sentence. Each question carries *'one'* mark.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1.	Define Data structure.	M1.01	R
2.	Queue is a linear data structure where data can be inserted at……….end.	M1.04	R
3.	Name the Queue in which last element is connected to the first element.	M1.05	R
4.	In a .... .linked list traversal of data happens in unidirectional.	M2.02	R
5.	In a………linked list first and last nodes are connected to form a cycle.	M2.03	R
6.	Write the inorder traversal of binary search tree with keys 5,7,2,3,8,9,10	M3.03	A
7.	Define the terms path and path length of a binarytree.	M3.01	R
8.	Two or more edges incident on same set of vertices is called.	M4.01	R
9.	Name a simple undirected graph in which every pair of distinct vertices are connected by unique edge are called………………………	M4.02	R

PART-B
II. Answer any *eight* questions from the following. Each question carries *'three'* marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1.	If the sequence of operations needs to be performed in a queue (a) insert an element 10 (b) insert an element 20 (c) delete an element (d) insert an element 15 (e) insert an element 22 (f) delete an element (g) delete an element (h) delete an element (i) insert an element 27 (j) delete an element Write the sequence of deleted values.	M1.04	A
2.	Write a short note on Dequeue Data structure.	M1.05	U
3.	Describe Circular Linked list with a diagram.	M2.03	U
4.	Draw a linked list representation of stack.	M2.04	U

5.	Define the binary tree terminologies with help of a diagram i) degree of a node (ii) height of a tree	M3.01	R
6.	Draw and explain (i) perfect binary tree	M3.02	U
7.	Define (i) sub graph (ii) adjacent vertices with the help of diagrams.	M4.01	R
8.	List different types of graph.	M4.01	R

9.	Name the following
	  (i) Basic data structure operation used to print all
	   elements in the data structure.
	  (ii) Write underflow and overflow condition in Queue
		M1.01
		
		M1.04
		
		M1.03
			R

10.	Explain doubly linked list with the help of a diagram.	M2.03	U

PART-C
Answer all questions. Each question carries *'seven'* marks

(6 x 7 = 42 Marks)

Module Outcome   Cognitive level

III.	Evaluate postfix expression 5 3 2 * + 4 – 5 + using stack. Write pseudo code/algorithm/program for evaluation.	M1.03	A
	OR		
IV	Convert 2 * 3 / (2 - 1) +5 * 3 into postfix using stack .Write pseudo code/algorithm/program for implementing it.	M1.03	A
V.	Describe array representation of circular queue and its operations.	M1.04	U
	OR		
VI.	Explain how we can implement stack using array.	M1.02	U
VII.	Elaborate the singly Linked List operations such as (i) delete an element and (ii) traversal using algorithm.	M2.02	U
	OR		
VIII.	Draw the diagram of different types of linked list.	M2.02	R
IX.	Explain about expression tree and threaded binary tree.	M3.04	U
	OR		
X.	Construct a Binary search tree for the sequence of numbers **10,12,5,4,20,8,7,15 and 13** and how to search an element with proper pseudo code/algorithm.	M3.03	A
XI.	Describe Depth First search algorithm with an example.	M4.04	U
	OR		
XII.	Explain set and linked list representation of graph.	M4.02	U
XIII.	Explain any two types of binary trees.	M3.04	U
	OR		
XIV.	Illustrate with an example the preorder traversal algorithm of binary search tree.	M3.03	U

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