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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.

 $(9 \times 1 = 9 \text{ Marks})$

		Module Outcome	Cognitive level
1.	Define Data structure.	M1.01	R
2.	Queue is a linear data structure where data can be inserted atend.	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 alinked 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	M1.04	A
	(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.		
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



https://gptcthirurangadi.in M3.01 R Define the binary tree terminologies with help of a diagram degree of a node (ii) height of a tree Draw and explain (i) perfect binary tree M3.02 U 6. Define (i) sub graph (ii) adjacent vertices with the help of diagrams. 7. M4.01 R 8. List different types of graph. M4.01 R 9. Name the following M1.01 (i) Basic data structure operation used to print all elements in the data structure. M1.04 R (ii) Write underflow and overflow condition in Queue M1.03 M2.03U 10. Explain doubly linked list with the help of a diagram.

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	M1.03	Α
	pseudo code/algorithm/program for evaluation.		
	OR		
IV.	Convert $2 * 3 / (2 - 1) + 5 * 3$ into postfix using stack. Write	M1.03	A
	pseudo code/algorithm/program for implementing it.		
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
V 1.	Explain new we can implement stack using array.	1,11.02	C
VII.	Elaborate the singly Linked List operations such as (i) delete an	M2.02	U
	element and (ii) traversal using algorithm.		
	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	M3.03	A
	10,12,5,4,20,8,7,15 and 13 and how to search an element with		
XI.	proper pseudo code/algorithm. Describe Depth First search algorithm with an example.	M4.04	U
211.		1411.01	Ü
	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	M3.03	U
	binary search tree.		
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