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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

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 1 mark.

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	Define Data Structures.	M1.01	R
2	Name the different data structures that use the principles of:- (i) LIFO (ii) FIFO	M1.01	R
3	Draw the node structure of Doubly Linked List.	M2.03	A
4	Define Linked List.	M2.01	U
5	A …….. is a tree in which every node other than the leaves has two children.	M3.01	U
6	In a tree data structure, the total number of edges from leaf node to a particular node in the longest path is called ……. of that node.	M3.01	U
7	Define graph.	M4.01	U
8	Define Acyclic Graph.	M4.01	U
9	In a queue deletion is done from the ….. end.	M1.04	U

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

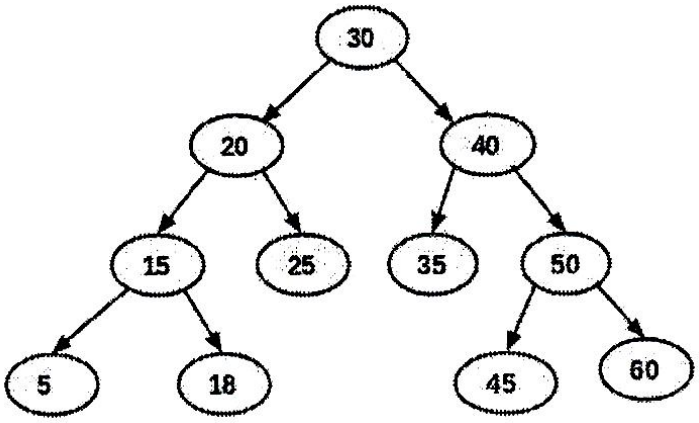
(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Explain about Dequeue.	M1.05	U
2	Describe Infix, Prefix, Postfix Expressions with examples.	M1.03	U
3	List different applications of Stack.	M1.03	R
4	Explain how an element can be deleted from the beginning of a singly linked list.	M2.02	U
5	Explain different types of Linked List.	M2.03	U
6	Write a note about the perfect binary tree.	M3.01	U
7	Draw Binary Search Tree for the elements 50, 20, 100, 30, 200, 10, 150.	M3.04	A
8	Illustrate the array representation of Binary Tree with suitable example.	M3.02	U
9	List two methods for representing Graphs. Give examples for both.	M4.02	R
10	Explain (i) Weighted Graph (ii) Directed Graph	M4.01	U

PART C

Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Explain circular Queue and priority queue.	M1.05	R
	OR		
IV	Explain implementation of Queue using Array.	M1.04	U
V	Explain Insertion operation in Linked List.	M2.02	R
	OR		
VI	Explain implementation of Stack using Linked List.	M2.04	U
VII	Draw a complete Binary tree and explain the following. (i) Degree of a node (ii) Level of a node (iii) Leaf node (iv) Sibling of a node	M3.01	U
	OR		
VIII	Explain Preorder and Inorder Tree traversal methods.	M3.03	R
IX	Explain Depth First Search Graph traversal Algorithm.	M4.03	U
	OR		
X	Explain Warshall's Shortest Path Algorithm.	M4.04	R
XI	Evaluate the following Postfix expression using stack and give the result. (a) A B + D E / - Where A=6, B=2, D=8 and E=4. (b) A B C D - + * Where A=4, B=2, C=3, D=5.	M1.03	A
	OR		
XII	Explain implementation of POP and PUSH operations of stack using array.	M1.02	U
XIII	Draw the following graphs, with 4 vertices. (i) Complete Graph (ii) Undirected Graph	M4.01	A
	OR		
XIV	Show the preorder, postorder traversals on the following BST.  	M4.03	A

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