

Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Hi-Tech Institute of Engineering & Technology
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MODEL TEST PAPER
DATA STRUCTURE

Time: 3 Hours

Total Marks: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 7 = 14

a.	Differentiate linear and non linear data structures.
b.	How do you insert and delete elements in a stack?
c.	What is recursion? Give disadvantages of recursion.
d.	What is sorting? How is sorting essential for database applications?
e.	How graph can be represented in memory? Explain with suitable example.
f.	Number of nodes in a complete tree is 100000. Find its depth.
g.	What is the maximum height of any AVL tree with 7 nodes?

SECTION B

2. Attempt any three of the following: 7 x 3 = 21

a.	What do you understand by the time space tradeoff ? Explain best, worst and average case analysis in this respect with an example.
b.	What is recursion? Write a recursive program to find sum of digits of the given number. Also, calculate the time complexity.
c.	Write an algorithm for merge sort. Using the algorithm sort in ascending order: 10,25,16,5,35,48,8.
d.	Construct a binary tree for the following: Inorder: Q,B,K,C,A,G,P,E,D,H,R Postorder: G,B,Q,A,C,K,F,P,D,E,R,H
e.	Explain in detail about the graph traversal techniques with suitable examples.

SECTION C

3. Attempt any one part of the following: 7 x 1 = 7

(a)	Write a program to insert a node at end in a circular linked list.
(b)	Explain how a circular queue can be implemented using arrays. Write all functions for circular queue operations.

4. Attempt any one part of the following: 7 x 1 = 7

(a)	Write the procedures for insertion, deletion and traversal of a queue.
(b)	What is stack? Implement stack with singly linked list.

Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Hi-Tech Institute of Engineering & Technology
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MODEL TEST PAPER
DATA STRUCTURES

5. Attempt any one part of the following:

7 x 1 = 7

(a)	Explain sequential search and index sequential search.
(b)	Explain bubble sort with its algorithm.

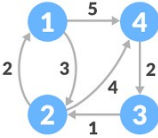
6. Attempt any one part of the following:

7 x 1 = 7

(a)	Discuss left skewed and right skewed binary tree. Construct an AVL tree by inserting the following elements in the order of their occurrence: 60, 2, 14, 22, 13, 111, 92, 86
(b)	What is B-Tree? Write the various properties of B- Tree. Show the results of inserting the keys F, S, Q, K, C, L, H, T, V, W, M, R, N, P, A, B in order into a empty B-Tree of order 5.

7. Attempt any one part of the following:

7 x 1 = 7

(a)	<p>Write and explain the Floyd Warshall algorithm to find the all pair shortest path. Use the Floyd Warshall algorithm to find shortest path among all the vertices in the given graph:</p> 
(b)	<p>What is spanning tree? Write down the Prim's algorithm to obtain minimum cost spanning tree. Use Prim's algorithm to find the minimum cost spanning tree in the following graph:</p> 