HI TECH INSTITUTE OF ENGINEERING AND TECHNOLOGY ,GHAZIABAD

Roll No: …….

Hi-Tech Institute of Engineering & Technology
DEPARTMENT OF COMPUTER APPLICATION
Course- MCA.
(SEM-2) EVEN SEMESTER Model paper- 1

Subject Code: KCA-205 **Subject Name: Data Structures & Analysis of Algorithms**
Time: 3: 00 Hours **Total Marks: 100**
Note: 1. Attempt all Sections. If require any missing data, then choose suitably.

SECTION-A

1. Attempt all question in brief. **2x 10 = 20**

Q.No	Question	Marks	CO
a.	Write a short note on Sparse Array with example?	2	1
b.	Give application of link list.	2	1
c.	Explain the Concept of 'Tower of Hanoi'.	2	2
d.	Convert following infix expression into postfix expression: A + (B * C + D) / E	2	2
e.	Give an example to demonstration of Insertion short.	2	3
f.	How the graph can be traversed using Breadth First search (BFS)?	2	3
g.	Explain the term Huffman coding using Binary Tree with example.	2	4
h.	Draw the expression tree or 2-tree of following expression- (2 * (4 + (5 + 3)))	2	4
i.	Discuss Strassen's algorithm for matrix multiplication.	2	5
j.	What do you mean by Merge sort? Give an example.	2	5

SECTION-B

2. Attempt any three of the following: **10x3 =30**

Q.No	Question	Marks	CO
a.	What is doubly linked list? Write a function to traverse a doubly linked list in reverse order.	10	1
b.	Explain the term Binary searching with an suitable example.	10	2
c.	Use heap sort algorithm to sort following sequence: {8,5,45,24,36,11,43,21}. What is the time complexity of the algorithm?	10	3
d.	What do you mean by tree traversal? Explain each type by an example.	10	4
e.	Discuss Longest Common Subsequence (LCS) problem solution by using dynamic programming. Give an Example.	10	5

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SECTION-C

3. Attempt any ONE part of the following: 10x1 = 10

Q.No	Question	Marks	CO
a.	Write a function or algorithm to add two polynomials using linked list.	10	1
b.	How many ways to explain the 2D array? Explain with example.	10	1

4. Attempt any ONE part of the following: 10x1 = 10

Q.No	Question	Marks	CO
a.	What do you understand by hashing? Consider inserting keys {76,26,37,59,21,65,88} into hash table of size m=11. Using linear probing, consider the primary hash function is h'(k) = k mod m.	10	2
b.	What do you mean by Stack. Also explain the all operations with an example.	10	2

5. Attempt any ONE part of the following: 10x1 = 10

Q.No	Question	Marks	CO
a.	Use heap sort algorithm to sort following sequence: {8,5,45,24,36,11,43,21}. What is the time complexity of the algorithm?	5	3
b.	Explain the term Radix and Bucket sort with an example.	10	3

6. Attempt any ONE part of the following: 10x1 = 10

Q.No	Question	Marks	CO
a.	How BST is different from sorted array? Discuss the process to find an element in BST?	10	4
b.	Construct a binary tree when Pre-order and Post-order are given as- Pre-order: 1,2,4,8,9,5,3,6,7 and Post-order:- 8,9,4,5,2,6,7,3,1	10	4

7. Attempt any ONE part of the following: 10x1 = 10

Q.No	Question	Marks	CO
a.	What is the minimum spanning tree? Explain any one MST algorithm with an example.	10	5
b.	Explain the term Dijikstra Algorithm to finding single sourse shortest path with an example.	10	5