DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY

B.TECH. SEMESTER IV [Information Technology]

SUBJECT: (IT 406) Data structures and Algorithms

Examination	**:Block Exam**	**Seat No.**	**:**
Date	**:**	**Day**	**:**
Time	**:**	**Max. Marks**	**: 36**

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 **Do as directed.** **[12]**

(a) Construct expression tree for the following postfix expression: **[03]**
A B + C – D E + F * -

(b) Discuss: Linear probing and chaining. **[03]**

(c) List the properties of red black trees. **[02]**

(d) Draw a complete binary tree with exactly 6 nodes. **[02]**

(e) Which data structure is used to perform recursion? Why? **[02]**

Q.2 Attempt following questions. **[12]**

(a) Write an algorithm to perform list sort using doubly link list. Algorithm should sort data elements according to physical location. Data set is logically sorted. **[06]**

(b) Write recursive and non recursive algorithm to perform inorder traversal. **[06]**

OR

(b) Construct AVL tree for the following data: **[06]**
A Z B Y C X D U E

Q.3 Attempt following questions **[12]**

(a) Write an algorithm to implement recursive merge sort on array of integers. **[06]**

(b) Write an Algorithm to insert an element in Maximum Heap. **[06]**

OR

Q.3 Attempt following questions **[12]**

(a) i)Enlist Properties of Binary Search tree. **[06]**
ii) Explain with appropriate examples: Insertion and deletion in BST for different cases.

(b) Construct red black tree for the given alphabets: A L G O R I T H M **[06]**