Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[4857]-1044

S.E. (E & TC/Electronics) (I Sem.) EXAMINATION, 2015

DATA STRUCTURES AND ALGORITHMS

(2012 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data, if necessary.

1. (*a*) Write a C function for linear search. Discuss its time complexity. [6]

(*b*) How can a polynomial be stored using an array ? Explain with example. [6]

Or

2. (*a*) Explain parameter passing by value and passing parameter by reference with suitable example. [6]

(*b*) Explain selection sort algorithm. [6]

3. (*a*) What is doubly linked list ? Explain insert operation in doubly linked list. [6]

(*b*) Evaluate the following postfix expression using stack [7]

6 2 3 + – 3 8 2 / + * 2 ^

(note : ^ stands for power and all operands are single digit).

P.T.O.

Or

4. (*a*) What is singly linked list ? Explain traversal operation in singly linked list. [7]

(*b*) Write a short note on circular queue. Compare it with linear queue. [6]

5. (*a*) What is Binary Search Tree (BST) ? Explain the following operations in BST : [7]

(*i*) Searching a value in BST

(*ii*) Inserting a new value in BST.

(*b*) What is AVL tree ? Define Balance factor. Explain RR rotation with an example. [5]

Or

6. (*a*) What is Binary Search Tree (BST) ? Construct a BST for the following numbers : [8]

47, 55, 23, 17, 39, 11, 50, 9, 19, 74, 33, 28

Show all the steps.

Write its preorder traversal.

(*b*) Explain threaded binary tree with an example. What is its advantage ? [4]

7. (*a*) Write a C function to implement "Breadth First Search" traversal of a graph implemented using adjacency matrix. [6]

(*b*) What do you mean by indegree and outdegree of a vertex in a graph ? Write a C function to find indegree and outdegree of a vertex in a graph implemented using adjacency matrix. [7]

Or

8. (*a*) Define the term Graph. With the help of suitable example give adjacency matrix representation and adjacency list representation of the graph. [7]

(*b*) What do you mean by spanning tree of a graph ? Find the minimal spanning tree of the following graph using Prim's algorithm. [6]