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

Seat No.	

[4757]-1045

S.E. (E&TC/Electronics) (First Semester) EXAMINATION, 2015
DATA STRUCTURE AND ALGORITHM
(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*) What do you mean by recursive function ? Explain with example. [6]

(*b*) Write a C function for insertion sort to sort integer numbers. [6]

Or

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

(*b*) What is pointer ? What are the advantages of using pointer ? Explain pointer declaration and its initialization with an example. [6]

3. (*a*) What is singly linked list ? Write C function for inserting a node at a given location into a Singly Linked List. [6]

P.T.O.

(*b*) Evaluate the following postfix expression using stack

$$623 + - 382/+ * 2\wedge.$$

Note : $\wedge$ stands for power and all operands are single digit. [7]

Or

4. (*a*) Write short notes on :

(*i*) Circular Linked list and

(*ii*) Doubly linked list. [6]

(*b*) What is priority queue ? Explain its implementation using any *one* method. [7]

5. (*a*) What is Binary Search Tree (BST) ? Write C functions for :

(*i*) Finding the smallest number in BST

(*ii*) Recursive inorder traversal of BST. [7]

(*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 :

27, 42, 43, 17, 39, 31, 10, 9, 19, 54, 33, 48.

Show all the steps. Write its preorder traversal. [8]

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

7. (*a*) Write C function to implement Depth 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 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 a graph. [7]

(*b*) What do you mean by spanning tree of a graph ? Find the minimal spanning tree of the following graph using Kruskal's algorithm. (Refer Fig. 1) [6]

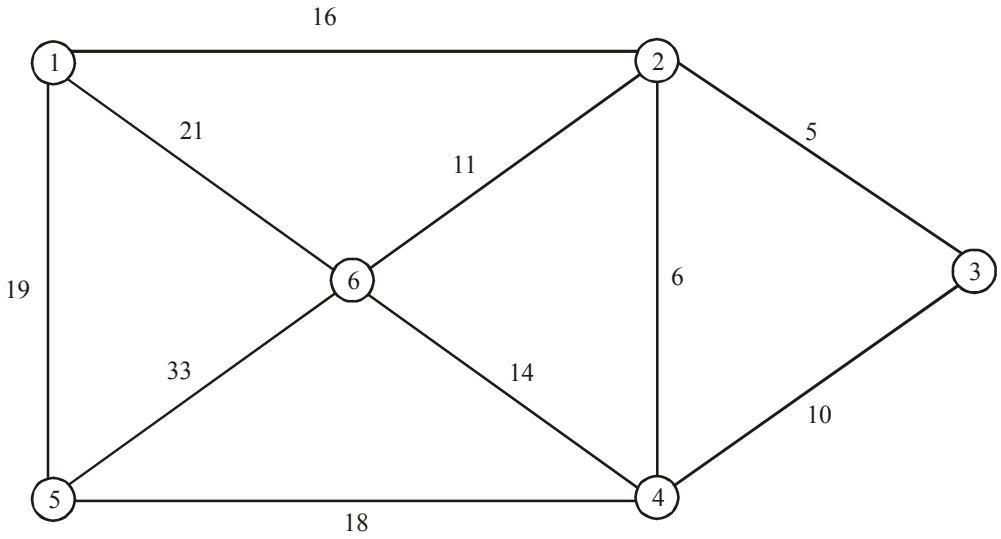

Fig. 1