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[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]

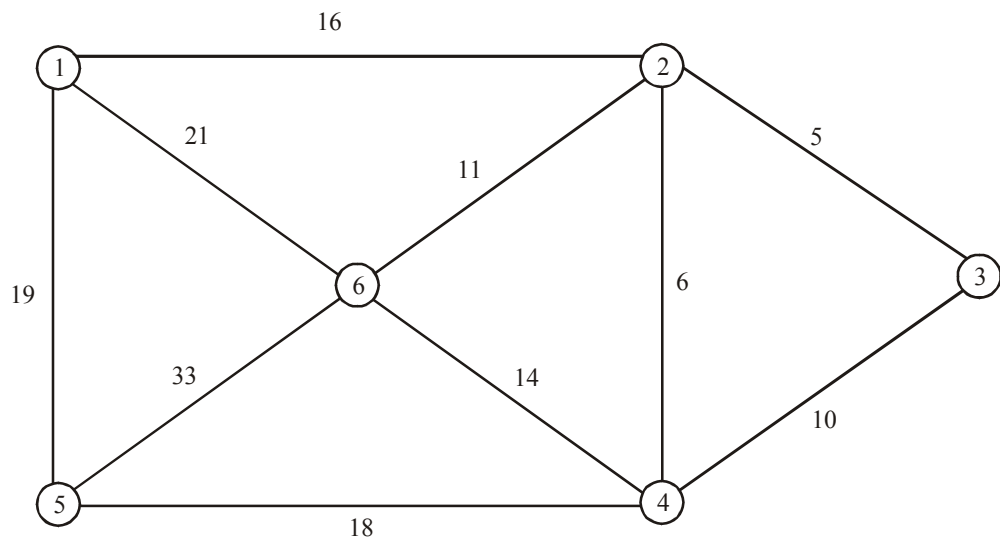


Fig. 1