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S.E (E&TC/Electronics) (I Semester) EXAMINATION, 2017
DATA STRUCTURES AND ALGORITHMS
(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

- N.B. :—** (i) Neat diagram must be drawn wherever necessary.
(ii) Figures to the right indicate full marks.
(iii) Use of non-programmable electronic pocket calculator is allowed.
(iv) Assume suitable data, if necessary.

1. (a) What do you mean by recursive function ? Explain with suitable example. [6]
(b) Write a C function for insertion sort to sort integer numbers.[6]

Or

2. (a) Explain with suitable examples, how do you pass structure variable to a function. [6]
(b) What is pointer ? What are the advantages using pointer ? Explain pointer declaration and its initialization with an example.[6]
3. (a) Differentiate between SLL and DLL. [4]
(b) Write PUSH function to implement stack using array. [4]
(c) Name types of queues. Explain any *one* in detail. [4]

Or

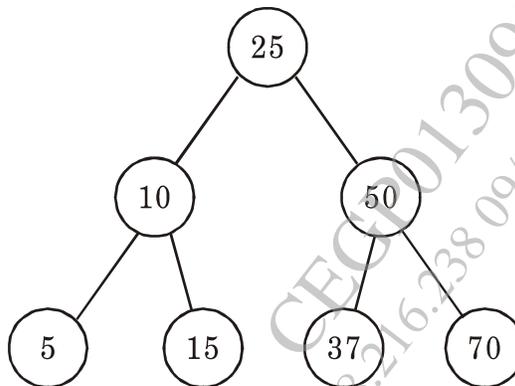
4. (a) Write short notes on : [6]
(i) Circular Linked List.
(ii) Doubly Link List.

P.T.O.

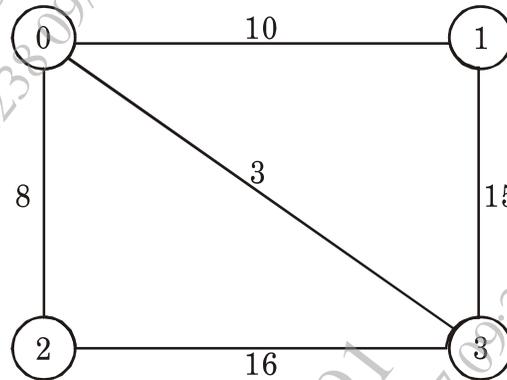
- (b) What is queue ? Explain its implementation using any *one* method. [6]
5. (a) Using the following data, draw a Binary Search Tree. Show all steps. [4]
10 60 40 28 14 50 5
- (b) Write a C function to search element in Binary Search Tree.[4]
- (c) Define the following terms :
- (i) Root
 - (ii) Subtree
 - (iii) Level of Node
 - (iv) Dept of Tree
 - (v) Siblings
 - (vi) Height of tree

Or

6. (a) Define Binary Tree. What are its types ? Explain with suitable figures. [4]
- (b) Write inorder, preorder and postorder traversals for the following tree. [6]



- (c) Explain algorithm to Insert an element in BST. [4]
7. (a) Explain Dijkstra's algorithm with example. [7]
- (b) What do you mean by spanning tree of a graph ? Find minimal spanning tree of the following graph using Kruskal's algorithm.[6]



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) Define DSF and BSF terms of graph with example. [6]