Total No. of Questions—**12**] [Total No. of Printed Pages—**4**

Seat No.	

[4857]-207

S.E. (Computer) (Second Semester)

EXAMINATION, 2015

DATA STRUCTURES

(2008 PATTERN)

Time : Three Hours **Maximum Marks : 100**

N.B. **:—** (*i*) Answer *three* questions from Section I and *three* questions from Section II.

(*ii*) Answers to the two Sections should be written in separate answer-books.

(*iii*) Neat diagrams must be drawn wherever necessary.

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

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

SECTION I

1. (*a*) Define General Tree, Binary Tree, Full Binary Tree, Complete Binary Tree, Skewed Binary Tree and explain in how many ways binary tree can be traversed ? Explain with a suitable example. [10]

(*b*) Write and show how recursive algorithms for inorder and postorder traversal of binary tree works with suitable example having at least **6** nodes. [8]

Or

2. (*a*) What is the solution to avoid more number of null links in Binary Tree ? How is node represented in linked structure

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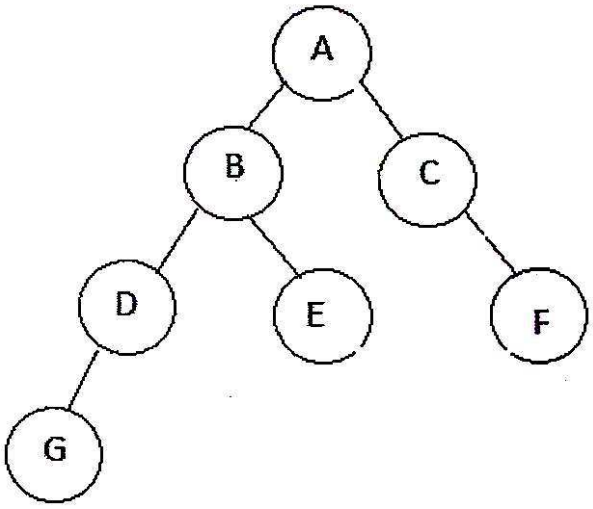
in Threaded Binary Tree ? Convert the following Tree into Threaded Binary Tree. [10]



(*b*) What is Binary Search Tree (BST) ? State how nodes are inserted in deleted and for which different operations it is used ? [8]

3. (*a*) Write Kruskal's algorithm and its working with suitable example. [8]

(*b*) Which algorithms are used to find the shortest path ? Explain Dijkstra's algorithm with example. [8]

Or

4. (*a*) Write an algorithm to print Depth First Search (DFS) traversal for graphs. Give its time complexity. [8]

(*b*) Write an ADT of graph. Explain how graph can be represented. Explain with suitable example and write applications of the graph. [8]

5. (*a*) What are the features of the AVL tree ? Write an algorithm to insert node in AVL tree. [8]

(*b*) What is symbol table ? Write an ADT for symbol table. [8]

Or

6. (*a*) Define Height Balance Tree. What do you mean by balance factor of tree ? What is the condition for any node in tree to be balanced and how it is satisfied ? [8]

(*b*) Why is hashing required ? Explain different hash functions and discuss about a way to handle overflow in hashing. [8]

SECTION II

7. (*a*) What is heap ? Write an algorithm to insert an element to heap and explain the process with suitable example to insert 6 elements. [10]

(*b*) What is B-tree ? Explain the process for deleting a particular value from B-tree. [8]

Or

8. (*a*) Define max heap and min heap and draw Max heap for 35, 72, 20, 85, 41, 55, 70. [10]

(*b*) Define B+ tree. Write a node deletion method for B+ tree. [8]

9. (*a*) What is file ? Is it a data structure ? List different file operation modes. [8]

(*b*) What do you mean by Index File Organization ? State its advantages. [8]

Or

10. (*a*) Write an algorithm to perform create, insert, display and search operation for sequential file organization. [8]

(*b*) Explain in brief Linked and Direct File Organization. [8]

11. (*a*) Write a program C++ to implement stack using STL. [8]

(*b*) What do you mean by generic programming ? How is it achieved ? [8]

Or

12. (*a*) Explain the following terms : [8]

(*i*) Containers

(*ii*) Iterators

(*iii*) Inheritance in C++

(*iv*) Algorithms and characteristics.

(*b*) Give the implementation of a dqueue in a STL. [8]