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

Seat No.	

[4957]-207

S.E. (Comp.) (Second Semester) EXAMINATION, 2016

210250 : 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*) Answer to the two Sections should be written in separate-answer-books.

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

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

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

SECTION I

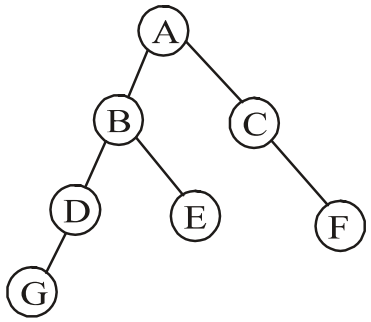
1. (*a*) Define General Tree, Binary Tree, Full Binary Tree, Complete Binary Tree, Skewed Binary Tree and explain in how many ways binary tree can be traversed. Explain with a suitable example. [10]

(*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]

P.T.O.

Or

2. (*a*) What is the solution to avoid more number of null links in binary tree. How node is represented in linked structure in threaded binary tree. Convert the following tree into threaded binary tree. [10]



(*b*) What is Binary Search Tree (BST). Write algorithms of insertion and deletion of a node. [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 Dijakstra's algorithm with an 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*) What hashing is 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. [8]

(*b*) Define B+ tree. Write a node deletion method for B+ tree. [10]

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 the organization. [8]

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

(*b*) What do you mean by genetic 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 deque in a STL. [8]