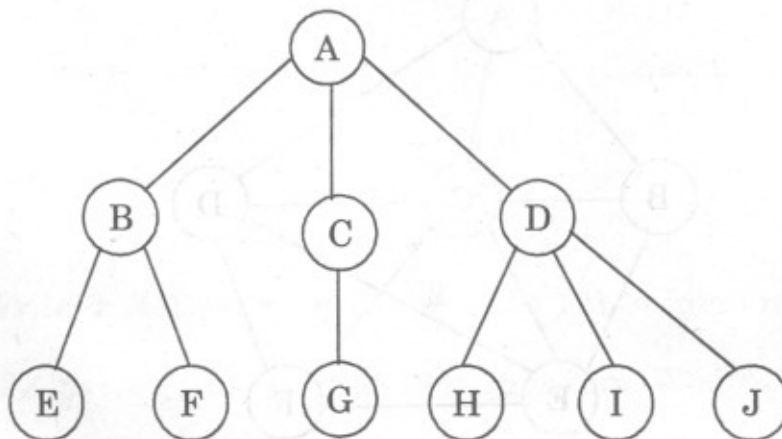


**S.E. (Comp.) (Second Semester) EXAMINATION, 2010****DATA STRUCTURES****(2008 COURSE)****Time : Three Hours****Maximum Marks : 100**

- 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**

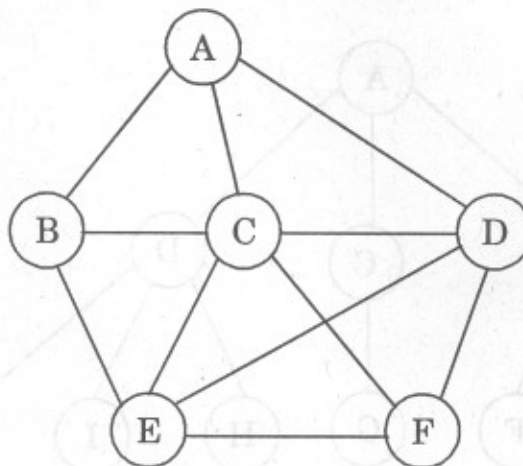
1. (a) What is binary tree ? How is it different than a basic tree ? Explain with figures. [5]
- (b) Convert the following tree to Binary tree step by step : [5]



- (c) Write a C/C++ function to print given binary tree in BFS (without using recursion). [8]

Or

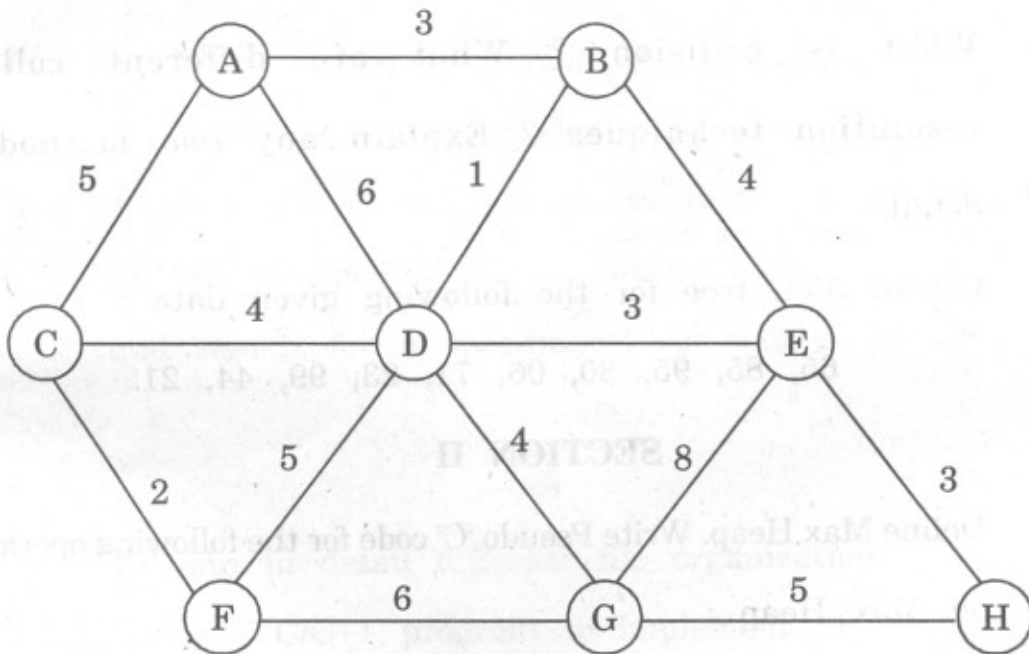
2. (a) (i) What is binary search tree ? Draw binary search tree for the following data : [4]  
10, 08, 15, 12, 13, 07, 09, 17, 20, 18, 04, 05.
- (ii) What is threaded binary tree ? What are the advantages of threaded binary tree over normal binary tree ? Draw an in-order threaded binary tree upto three levels. [6]
- (b) Write a pseudo 'C' function to print given in-order threaded binary tree. Display the tree in inorder without using extra data structures. [8]
3. (a) What is graph ? Draw how the following graph can be represented using linked organization : [8]



- (b) Write an algorithm to print a given graph in DFS. What is time complexity of your algorithm ? [8]

Or

4. (a) What is minimum spanning tree ? Find out minimum spanning tree for the given graph step-by-step : [8]



- (b) Write a C/C++ program to find out minimum spanning tree of a given graph using Prim's algorithm. What is time complexity of your algorithm ? [8]

5. (a) (i) What is height balanced tree ? Explain with *one* example. [4]
- (ii) Explain static and dynamic tree tables. [4]
- (b) Write a Pseudo 'C' algorithm for LL, RR, LR and RL rotations for AVL tree. [8]

Or

6. (a) What is collision ? What are different collision resolution techniques ? Explain any *two* methods in detail. [8]
- (b) Create AVL tree for the following given data : [8]
- 65, 85, 95, 30, 06, 71, 23, 99, 44, 21.

## SECTION II

7. (a) Define Max Heap. Write Pseudo 'C' code for the following operations on Max Heap : [10]
- (i) Insertion of element in Max Heap
- (ii) Deletion of an element from Max Heap.
- Mention time complexity of each operation.
- (b) What is the difference between B - tree and B + tree ?
- Construct B + tree of order 3 for the following : [8]
- F, S, Q, K, C, L, H, T, V, W, M, R.

Or

8. (a) Create Min Heap (Binary) for  
10, 12, 1, 14, 6, 5, 8, 15, 3, 9, 7, 4, 11, 13.  
After creating Min Heap delete element 8 from Heap and repair  
it. Then insert element 20 and show final result. [10]
- (b) What is B-tree ? Write a Pseudo 'C' algorithm for deleting  
a node from B-tree. [8]
9. (a) (i) What is file ? Explain types of files. [4]  
(ii) Explain different modes of opening files. [4]
- (b) Write a C/C++ program to create a file. Insert records in  
the file by opening file in append mode. Display all records  
and search for a specific record entered by user. [8]

Or

10. (a) Explain in detail different file organizations. [6]
- (b) Write a C/C++ program to implement direct access file for  
employee database and perform insert a record, search a record  
and display database. [10]
11. (a) (i) Differentiate between structures and classes. [4]  
(ii) What is STL ? What are the components of STL ? [4]
- (b) Write a 'C++' program using STL to perform sorting of given  
array of integers using bubble sort technique. [8]

Or

12. (a) Explain the following terms : [8]
- (i) Containers
  - (ii) Iterations
  - (iii) Algorithms
  - (iv) Generic programming.
- (b) Write a C++ program using STL to reverse the given array. [8]  
Use container template stack.