Total No of Questions: [12] *SEAT NO. :*

[Total No. of Pages : 2]

S.E. 2008(Computer Engineering)

Data Structures

(Semester -II)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Answer questions 1 or 2, 3 or 4, 5 or 6, 7 or 8, 9 or 10, 11 or 12.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***
5) ***Assume Suitable data if necessary***

SECTION I

Q1) a) What is binary tree ? How binary tee is represented using sequential and linked organization? What are the application of Binary tree [8]

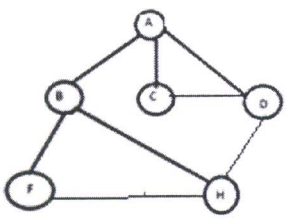
b) Draw binary search tree (BST) for the data:60,17,29,30,44,31,63,56,50 ,23 Write Binary search tree search(BST) algorithm. [10]

Or

Q2) a) What are the advantages of using threaded binary tree? With suitable example explain in-order threaded binary tree traversals. [10]

b) In how many ways binary tree can be traversed? Write a non-recursive in-order and preorder algorithm for traversal of binary tree [8]

Q3) a) What are the applications of Graph ? Write Depth First Search(DFS) and Breadth First Search (BFS) traversal for Following Graph . Write an algorithm for Depth First Search(DFS) traversal . [10]



b) Write the Prims algorithm for minimum spanning tree(MST) ? [6]

Or

Q4) a) Write the Abstract data type (ADT) for a graph ? Which data structures are used to traverse the graph , explain with suitable example ? [8]

b) Write Kruskal's algorithm for minimum spanning tree (MST) with suitable example? [8]

Q5) a) Why the rotations are done in AVL tree? Explain different types of [8]

rotations for AVL tree with suitable example?

b) What do you mean by Hashing ? Explain in brief different hashing methods? [8]

Or

Q6) a) Write an algorithm to delete node from AVL tree ? Show pictorially its working [8]

b) What is purpose of hashing ? Explain about collision resolution in hashing? [8]

SECTION II

Q7) a) Explain the working of heap sort for the list of 12 elements . Show how this sorting technique will sort the elements in ascending order [10]

b) What is B-tree ? Write an algorithm to delete value from B-tree [8]

Or

Q8) a) What is heap and its different types ? Write an algorithm to insert an element into heap ? [8]

b) Construct B-tree of order 5 for following elements. [10]

A G F B K D H M J E S I R X C L N T U P

Q9) a) Justify file is a data structure? List different file opening modes . Explain Index sequential file organization? [8]

b) What is linked and direct file organization, Explain in detail? [8]

Or

Q10) a) Write an algorithm to perform create, insert , display and search operations for sequential file organization ? [8]

b) How index sequential file organization is different from sequential file organization . Explain in which cases they are suitable ? [8]

Q11) a) What is STL ? Write a program in C++ to implement stack using STL. [8]

b) Write a program in C++ using list in a STL to implement Queue insertion and deletion operation ? [8]

Or

Q12) a) What are iterators and Containers ? Explain different types of Iterators in brief. [8]

b) Explain the following terms [8]

i) Generic Programming
ii) Inheritance in C++
iii) Template classes for vectors
iv) Classes and Objects