

Total No. of Questions – [08]

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G.R. No.	
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Paper Code - U228-123 (ESE)

MAY 2019/ENDSEM

S. Y. B. TECH. (COMPUTER) (SEMESTER - II)

COURSE NAME: Data Structures and Files

COURSE CODE: CSUA22173

(PATTERN 2017)

Time: [2 Hours]

[Max. Marks: 50]

Instructions to candidates:

- 1) Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data wherever required

Q.1) a) Describe an efficient method to merge two balanced binary search trees with n elements each into a balanced BST. Give its running time [6]

OR

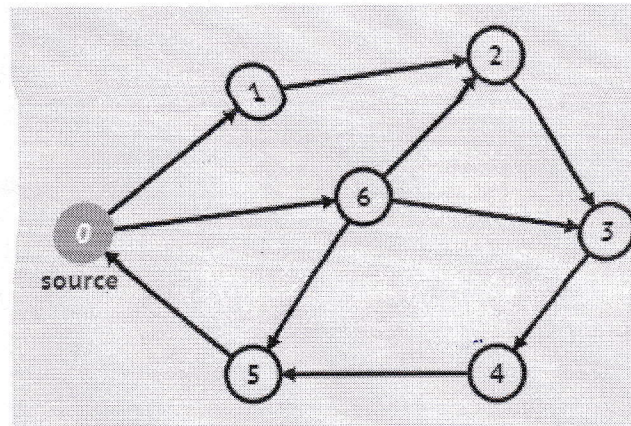
b) Inserting the values 40, 30, 60, 50, and 10 into a binary search tree, what is the output of calling function someOrder(root) written below? [6]

```
void someOrder(Node *p)
{ if (p != Null)
  { someOrder(p->right);
    cout << p->data << endl;
    someOrder(p->left);
  }
}
```

Q.2) a) Write the pseudo code for finding minimum spanning tree using Kruskal's algorithm. Find the running time for your algorithm [6]

OR

b) For the graph given below, find BFS and DFS stepwise. [6]



- Q.3) a) Given an array of 6 elements: 15, 19, 10, 7, 17, 16. Consider values as priorities and sort it in ascending order using heap sort. [6]

OR

- b) In the first phase of heap sort, initially random elements in array are rearranged to satisfy the heap structure constraints. How is this rearrangement done? Prove that it can be done in $O(n)$ time, where n is the number of elements in the array. [6]

- Q.4) a) For a given set of values : 9, 45, 13, 59, 12, 75, 88, 11, 105, 46 create a hash table and resolve collision using chaining without replacement ($H(x) = x \bmod 10$) [4]

OR

- b) Write a note on Height Balanced Search Trees [4]

- Q.5) a) Compare Sequential, Index sequential and Direct access files [6]
 b) Some N employee records are stored in a sequentially organized file. Write C++ code to find the value of N [4]
 c) List different types of indexing techniques [4]

OR

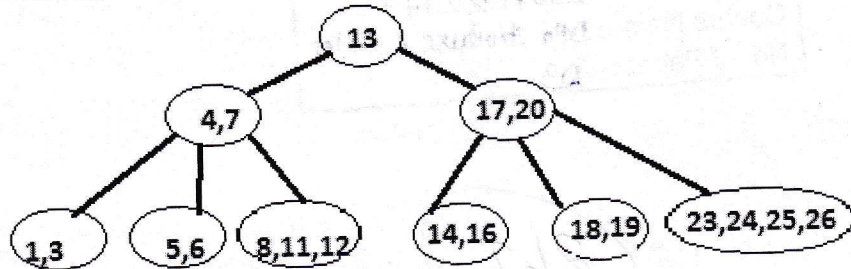
- Q.6) a) Explain C++ file open functions with syntax, example. Explain difference between C++ ios: :app and ios::ate flags associated with file open function [6]
 b) Explain how records can be logically deleted from the file [4]
 c) Write short note on hashed files [4]

- Q.7) a) What is the importance of a Red Black tree? Create a Red Black Tree with following Insertions 20, 12, 43, 55, 98, 13, 16, 17. Draw all the necessary diagrams [6]
 b) What is meant by splaying a node to the root? When and why is it done? [4]

- c) Draw and compare the detailed node structures of B and B+ tree [4] nodes.

OR

- Q.8) a) Delete the following keys - 8, 20, 18, 5, one after the other, from [6]
the B-Tree of order 5 shown below. Draw the resultant tree after
each deletion.



- b) What are Red Black trees? What are their advantages and [4]
disadvantages?
- c) Explain use of Trie data structure with example. [4]