Total No. of Questions – [08] Total No. of Printed Pages:03

G.R. No.	

Paper Code : U228-123 (RE-FS)

MAY 2019/ENDSEM RE EXAM

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 whereever required**

Q.1) a) i) List the steps to find Kth smallest element in Binary Search Tree [6]

ii) If array representation is used to store Binary Search Tree is the array sorted? Why?

iii) When using Binary search to search an array is the array sorted? Why?

OR

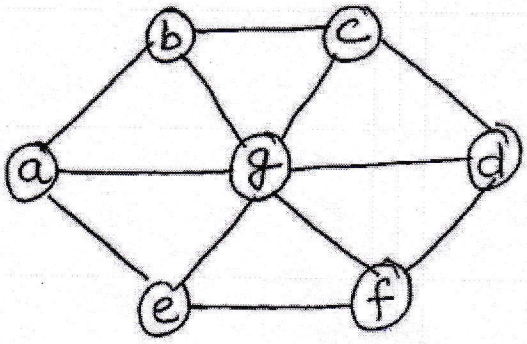
b) i) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. What is the inorder traversal sequence of the resultant tree? [6]

ii) Compare threaded binary trees with binary trees.

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

OR

b) Discuss the different graph representation techniques with respect to the following graph: [6]



Q.3) a) Answer the following regarding heap: [6]

i) Given an array of n elements sorted in non-ascending order. Is it a heap?
ii) In heap sort, after deleting the last minimum element, the array will contain elements in which order?
iii) What is the time taken to perform a delete min operation on a Max heap?
iv) For heap sort, after the first task of building heap, the next task requires swapping which 2 elements in array?
v) What is Bubble-up/Bubble-down?

OR

b) List the operations that are supported bypriority queue using Max heap. Write pseudocode for ExtractMax function and ChangePriority functions. [6]

Q.4) a) Write pseudo code for implementing hash table using linear probing with replacement [4]

OR

b) Write a note on OBST [4]

Q.5) a) What is file? Explain different types of file organizations [6]
b) With the prototype and example, explain following functions: [4]
i) seekg() ii)tellp()
c) Write a note on Multi-level indexing [4]

OR

Q.6) a) Distinguish between logical and physical deletion of the records and illustrate it with an example [6]
b) Explain inverted files with example [4]
c) With prototype explain the C++ language library functions for reading and writing characters and lines from a text file [4]

Q.7) a) Construct B+ tree of order 3 for the following: F,S,Q,K,C,L,H,T,V [6]

b) Briefly describe a Red Black tree? When we insert a node into a red-black tree, explain why we initially set the color of the new node to red and not black [4]

c) What are m-way search trees and B trees? Explain briefly [4]

OR

Q.8) a) What is the need for B trees? Create a B-Tree of order 3 for the following data: 20, 10,30, 15, 12, 40 ,50 [6]

b) What is a Splay tree? What are its advantages? Compare it with AVL tree. [4]

c) Compare Trie and Patricia Trie with an example. [4]