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Paper Code: : TMC 201

END SEMESTER Examination 2022

MCA II

Data Structure and File organization using 'C' language.

Time : Three Hours

Maximum Marks :100

INSTRUCTIONS TO STUDENTS

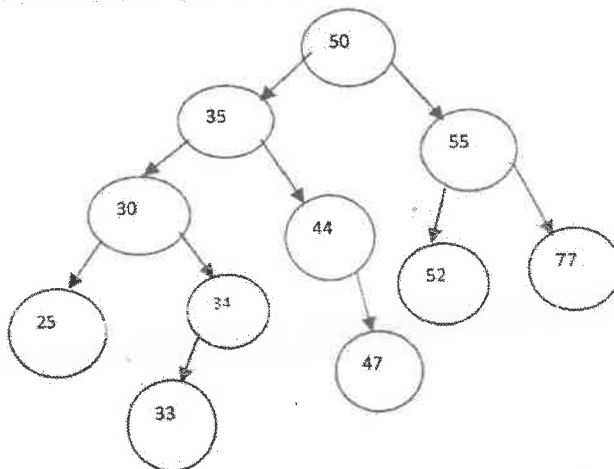
Note:

- (i) All questions are compulsory.
- (ii) Answer any two sub questions among a, b & c in each main question.

Q1.)

(2X10=20 Marks)(CO2, CO3,CO5)

a. Consider the tree given below:

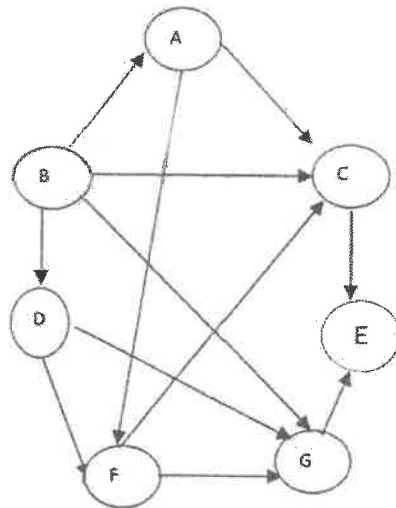


- i) Draw the tree after insertion of node 76 showing each step.
 - ii) Draw the tree after deletion of node 30 showing each step.
- b. Assume that we have a singly circular linked list. Write a C function print that circular linked list in such a way that last node will display first then first node and so on till second last node.
- c. Explain big oh notation. Write an algorithm to find the sum of elements stored in two 2-D arrays, then count total numbers of steps required by the algorithm also predict the nature of the algorithm.

2.)

(2X10=20 Marks)((CO3, CO4, CO5)

- a. Write application of B + tree. Draw a B - tree of order 4 with following keys :
92, 24, 6, 7, 11, 8, 100, 4, 5, 16, 19.
- b. Give linked representation and memory representation of following graph



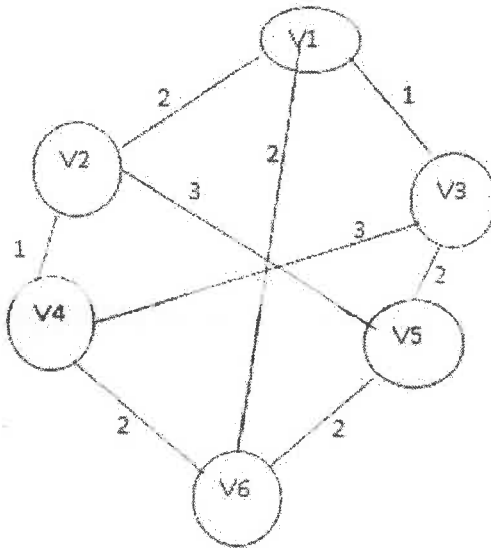
- c. Assume that we have single linked list , First node of the linked list is pointed by a pointer ptr. Write a c function to print the linked list in reverse order.

Q3.)

(2X10=20 Marks)(CO2, CO4, CO3)

- a. Explain Huffman's algorithm. Apply Huffman's algorithm to encode the following signal.
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b. Explain minimal spanning tree. Find minimal spanning tree of following graph, using Kruskal's algorithm.

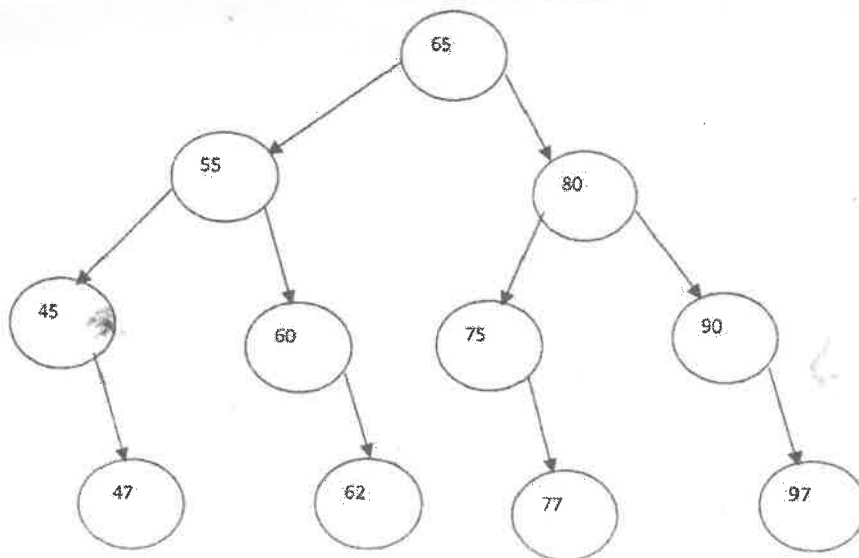


c. Explain hash collision with an example. Consider a hash table of size (m) 8. Using linear probing technique, insert following keys 1, 22, 47, 66, 54, 32, and 121 into the table.

Q4.)

(2X10=20 Marks)((CO1, CO3, CO4)

a. Consider the binary search tree given below:

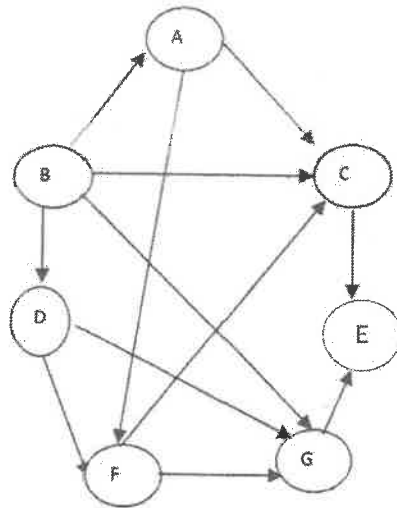


- i) Write preorder of the tree
- ii) Write post-order of the tree

2.)

(2X10=20 Marks)((CO3, CO4, CO5)

- a. Write application of B + tree. Draw a B - tree of order with following keys :
92, 24, 6, 7, 11, 8, 100, 4, 5, 16, 19.
- b. Give linked representation and memory representation of following graph



- c. Assume that we have single linked list , First node of the linked list is pointed by a pointerptr. Write a c function to print the linked list in reverse order.

Q3.)

(2X10=20 Marks)(CO2, CO4, CO3)

- a. Explain Huffman's algorithm. Apply Huffman's algorithm to encode the following signal.
acebccabadedcffeabedfecbf