Roll No.

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. *Write advantages of an AVL tree. Draw an AVL tree with following keys:*

4, 6, 9, 16, 7, 1, 5, 8, 10, 20, 25

b. *Write a C function to sort a sequence of string using quick sort technique.*

c. *Assume that we have a single linked list and a key value. First node of linked list is pointed by a pointer P. Write a C function to print the nodes having information multiple of the key value in the linked list*

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

a. *Explain sequential file organization and index sequential file organization with suitable examples*

b. *Explain Huffman's algorithm. Apply Huffman's algorithm to draw Huffman's tree, also find minimum weighed path length using following data.*
seacebcbddfebdfecbf

c. *Write a 'C' function to create a binary search tree and write another function to print the node having smallest information in the tree (do not use global variables).*

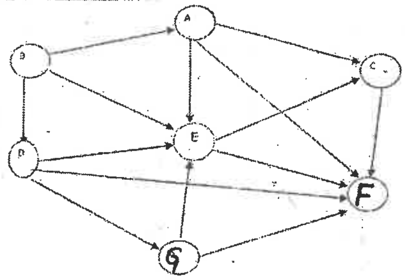
Q3.) (2X10=20 Marks) (CO2, CO4, CO3)

a. What is hashing? Give the characteristics of hash function. Explain any three hash functions.

b. *Write applications of B + tree. Draw a B - tree of order 4 with following keys :*

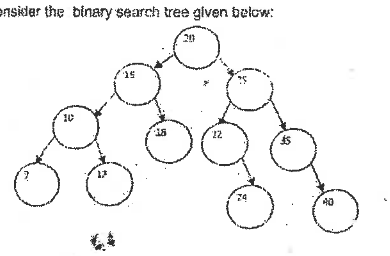
9, 8, 7, 10, 12, 4, 14, 3, 20, 25, 11, 13, 2

c. *Give linked representation and memory representation of following graph*



Q4.) (2X10=20 Marks) ((CO1, CO3, CO4)

a. Consider the binary search tree given below:



i) Write preorder of the tree

ii) Write in-order of the tree

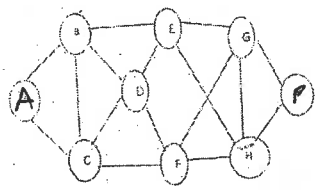
b. Assume that we have a single linked list . First node of the linked list pointed by pointer P. Write a C function to delete second last node in the linked list.

c. Convert the following infix expression into postfix expression using stack (Show all steps).
(p-q*a)/5-r*(u+v)%w+x

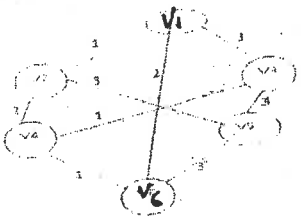
(2X10=20 Marks) (CO3, CO4, CO5)

Q5.

a. Give name and apply a graph traversal technique on the given graph, so that the number of nodes between A to P, are minimum.



b. Explain minimal spanning tree. Find minimal spanning tree of following graph, using Kurskal's algorithm.



c. Assume that you have a double linked list, first node of the list is pointed by pointer P, write a C function to insert a node before the last node in the list.