TMC-401 / TCS-410 / TIT-401

Roll No. | | | | | | | | | | |  Paper Code: TIT 401 / TCS 410 / TMC 401

End Semester Examination 2017

MCA / B.Tech III Semester

Data Structure using 'C' language.

Time: Three Hours  MM: 100

**Note:**
(i) This question paper contains five questions.
(ii) All questions are compulsory.
(iii) Instructions on how to attempt a question are mentioned against it.
(iv) Total marks assigned to each question are twenty.

Q1. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a)

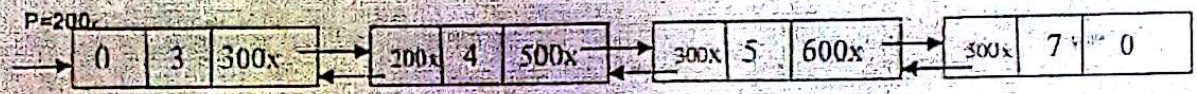
i) Write steps to delete node of following linked list with info 14.


ii) Evaluate the following postfix expression using stack

3 5 1 + 2 / +

b)

i) Write steps to insert a node after node having information 5.




ii) Convert following infix expression to postfix equivalent using stack

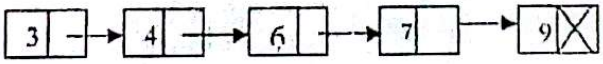
A – B * ( C % D ) ^ E

c)

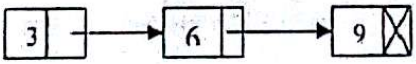
i) Given singly linked list. Write C function to delete all alternate nodes from the linked list.

Example :

Input




Out put



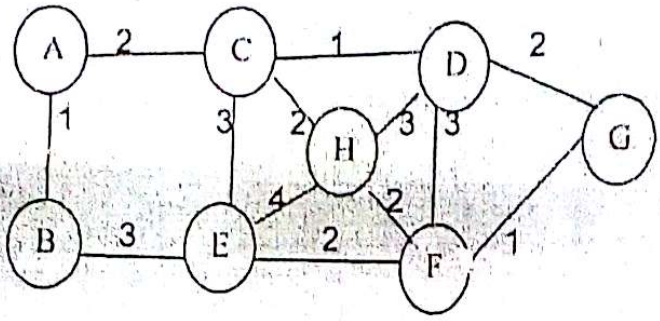

ii) Draw an AVL tree with following keys

3,4,11,2,6,7,9,12,8

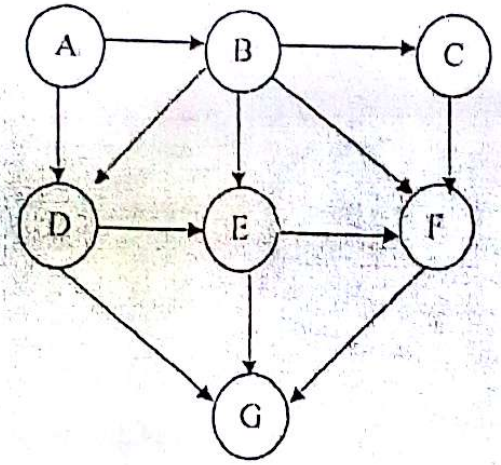
Q2. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a) Write a C function to Create a binary search tree of integers and then write a C function to print all values which are smaller than K ( Value of K should be given by user).

b) Write application of minimum spanning tree. Find minimum spanning tree of the graph given below using kurskal's algorithm.




C) Give memory representation of following graph




Q3. (Attempt any two questions of cho.ce from a, b and c) (2X10=20 Marks)

a) Write applications of Huffman's algorithm. Using Huffman's algorithm encode following signal.

b b b c b c c c c b c a a a d d d d d b a e e e b

b) Show the steps of merge sort on the following set of elements:
1115, 7222, 3338, 11137, 12333, 11112, 4446, 3999.

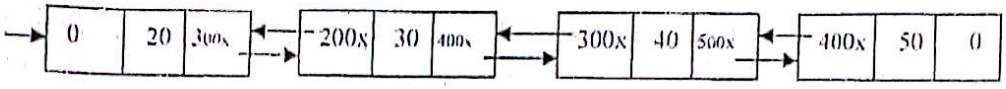
c) Apply linear probing to resolve collision when the hash function (key %10) is used to the following keys : 25, 75, 81, 55, 42, 120, 29, 156, 23,62 (Table size is 10).

Q4. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a) Draw the expression tree from following infix expression.
Ans - (P / X ^ Y ) ^ Q * ( R % S + T ) ^ U - G / H

b) Given a doubly linked list. First node of the linked list is pointed by pointer START and last node of the linked list is pointed by pointer END. Perform following operations and draw linked list after each operation.

START=200x END =500x

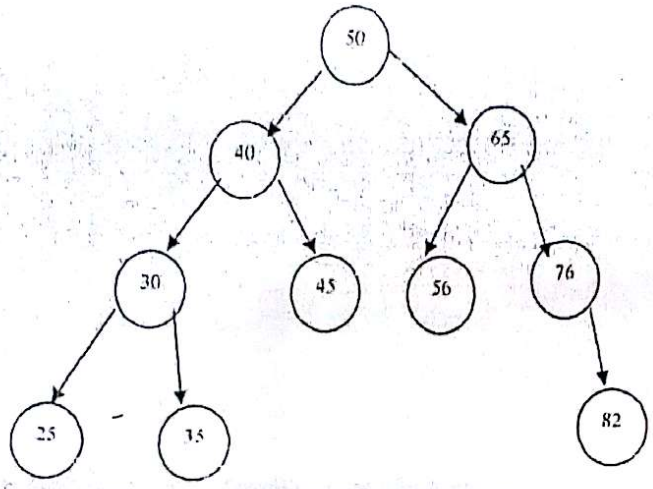



1. Insert a node with information 15 before first node having node address 150x..
2. Insert a node with information 35 in between 30 and 40 having node address 350x.
3. Delete last node.

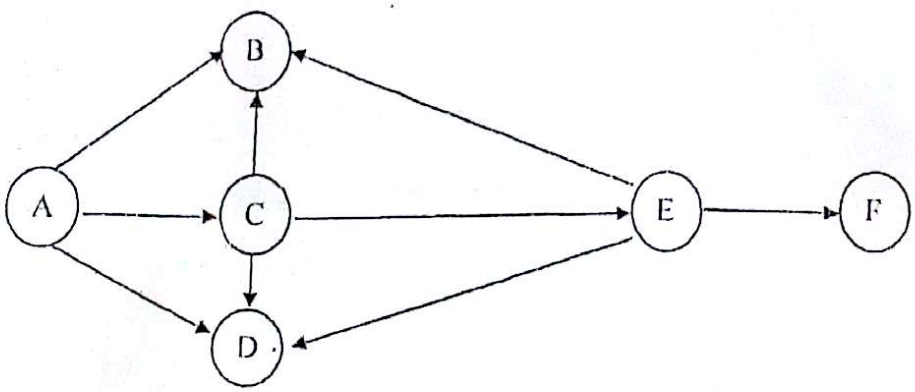
c) Write a C function for detecting a loop in a singly linked list, first node of than linked list is pointed by a pointer Ptr.

Q5. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a) Perform left and right threading on following tree




b ) Find one the possible paths to reach to all reachable nodes from A in following graph.




c) Draw the B-tree of order 3 which is created by inserting the following data arriving in sequence:

19, 14, 16, 17, 98, 13, 28, 18, 6, 7, 8, 3,