Roll No. | | | | | | | |

Paper Code: TIT 401 /TCS 410 / TMC 401

End Semester Examination 2018

MCA / B.Tech(EC/IT) IV 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.

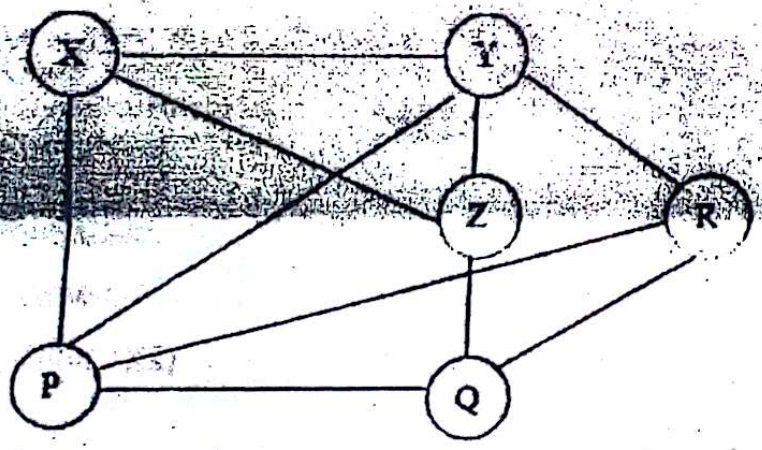
(iv) Marks assigned to each question are twenty.

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

a) Convert following infix expression into postfix expression using a stack: also evaluate the resultant postfix expression.
Infix expression: 5*2 - (4*(3+2)-1)/3

b) Explain balance factors in AVL tree also explain how to balnce a unbalance binary tree to balance binary tree. Draw an AVL tree with following keys
13,4,1,12,16,17,5,2,7,9

c) Give linked list representation of following graph



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

a) Write a C function to create a circular linked list using double pointer. Then print the list such that last node should be printed first and then first node and so on till second last node

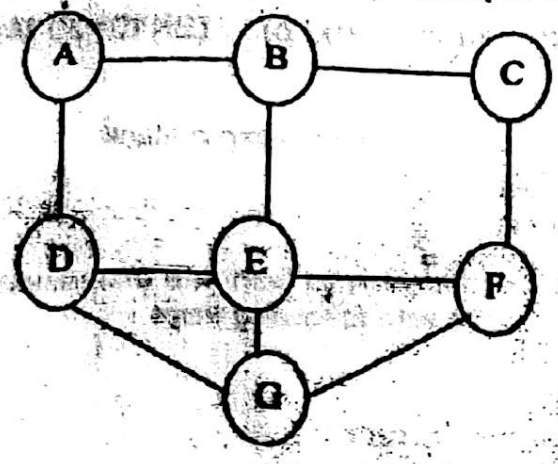
b) Write applications of B and B^+ trees. Draw a B tree of order 4 with following keys 32, 4, 5,36, 17, 8, 11, 22, 23, 24,45,77,10.

c) Explain insertion sort technique apply it on following data and show all steps.
34,66,12,37,89,45,53,43,33,3

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

a) Explain Huffman's algorithm. Using Huffman's algorithm encode following signal.
abcaccbbcbcccaaaddddbaccccb

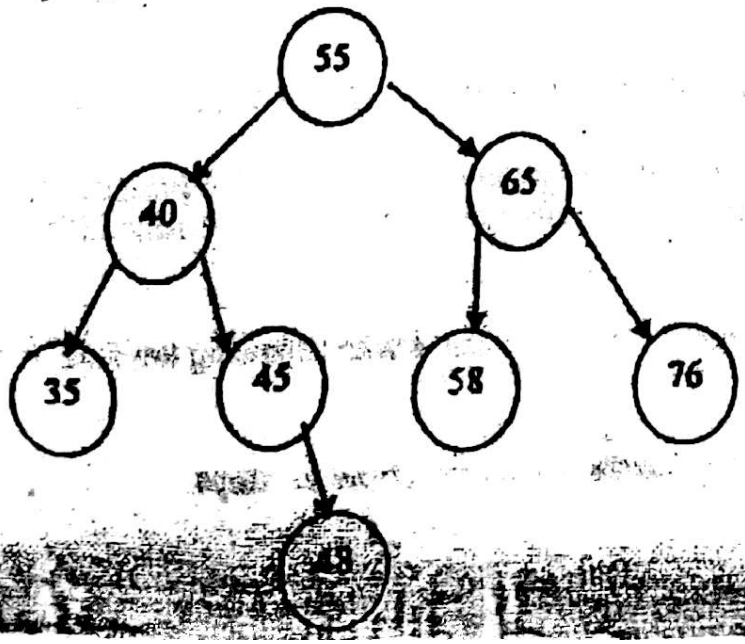
b) Apply Depth First Search technique on following graph starting from vertex A.



c) Explain following with examples
i) Linear probing
ii) Bucket addressing
iii) Quadratic probing

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

a) Explain threaded binary tree. Perform right threading on following tree



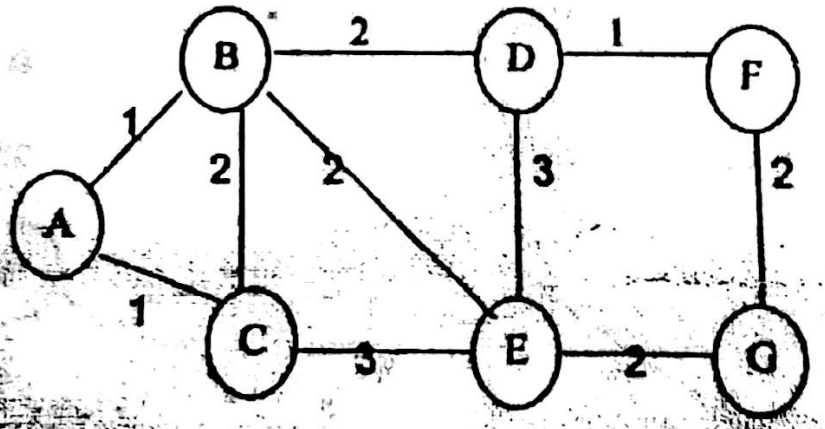
b) Draw the expression tree from following infix expression:
Z = (4*T/U)^3 % (4*X-Y)-R^3

c) Write a C function to create a doubly linked list by inserting nodes at right side and then print alternative nodes of the linked list (Use double pointer).

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

a) Write a 'C' function to count all those nodes from a singly linked(already created) having Information as a prime number.

b) Write applications of minimal spanning tree. Find minimal spanning tree of the following graph using kurskal's algorithm.



c) Explain Multi-key file organization and relative file organization with an example.