

Roll No.

Paper Code:

TCS 301

End Semester Examination 2019

B.Tech (CSE) III Semester

Data Structure using 'C' language.

MM: 100

Time: Three Hours

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)

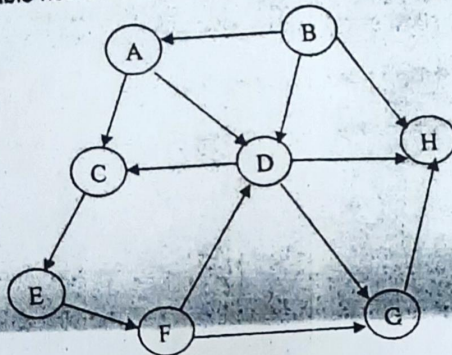
- a. Assuming that we have a stack made up linked list having a pointer top. Write a C function to print element from bottom to top.
- b. What do mean by an AVL tree? Write a advantages of an AVL tree. Draw an AVL tree with following keys: A, V, L, T, R, E.
- c. If in order traversal and preorder traversal of a binary tree are given as

In-order : D, B, E, A, F, C, H, G.
Pre-order : A, B, D, E, C, F, G, H.

Draw a binary tree from these tree traversals.

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

- a. Apply a graph traversal algorithm to find one of the possible paths to reach to all reachable nodes from node A, on following graph.
- b.



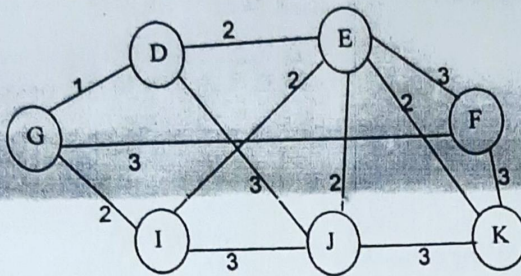
- b. Write applications of Huffman's algorithm? Using Huffman's algorithm encode following signal.
a a d d c e c e c a d a e c d e c a e c a d e a c d e a c d e e
- c. Explain hash collision with a example. Explain any two hash collision resolving techniques with examples.

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

- Write a 'C' function to create a binary search tree also write a function to count total number of leaf nodes.
- What do mean by B and B+ Tree? Draw a B tree of order 4 with following keys
4, 6, 7, 18, 9, 11, 12, 3, 20, 14, 17.
- What do you mean by asymptotic notations? Write an algorithm to find the sum of terms of Fibonacci series then count total steps required by the algorithm also predict the nature of the algorithm in terms of big oh notions.

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

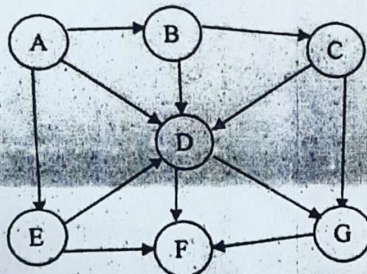
- Write an algorithm to convert an infix expression into postfix expression using stack. Show all step to convert the following infix expression into postfix expression using stack.
Expression: $7 + 5 + (3 \% (5 + 6) / 3) - 6 * 4$
- What do you mean by spanning tree. Find minimum spanning tree of the following graph.



- Write a 'C' function to sort an array using Merge sort technique. Apply Merge sort to arrange the given numbers in ascending order. Show all steps.
189, 160, 290, 380, 164, 199, 531, 111, 101, 909

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

- Give linked and memory representation of following graph.



- Explain index sequential file organization and relative file organization.
- Write C function to create a circular linked list using double pointers. Then count total no of nodes.