Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**

15BE2106

2nd Semester Back Examination 2018-19

DATA STRUCTURE USING C

BRANCH : AEIE, AUTO, CHEM, CIVIL, CSE, ECE, EEE, ELECTRICAL, ETC, FAT, IT, MECH, MINERAL, MME, PE, TEXTILE

Max Marks : 100

Time : 3 Hours

Q.CODE : F1010

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10) (2 x 10)

a) Distinguish between primitive data structure and non-primitive data structure.
b) List out few of the Application of data-structure.
c) Define a full binary tree & a complete binary tree.
d) What do you mean by balance factor of a node in AVL tree?
e) How can you check whether a binary tree is height balanced or not?
f) Is it possible to find a loop in a Linked list ? Explain your answer.
g) Differentiate between BFS vs DFS for Binary Tree.
h) How many stacks are required to implement a Queue.
i) Mention about the different types of Hashing Techniques.
j) What are the categories of AVL rotations?

Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

a) Illustrate an algorithm to insert a node at a particular location in a double linked list.
b) Write suitable functions or procedures to perform the following string operations:
   a) Check whether a string is empty
   b) Comparing whether 2 strings are identical
   c) Reverse of a string
c) Evaluate the arithmetic expression P written in postfix notation using stack.
P: 3, 16, 2, +, *, 12, 6, /, -,)
d) Develop an algorithm to insert an item and to delete an item from a queue.
e) Define tree. Explain basic terminologies used in tree.
f) Construct a binary tree from its given Preorder: A B D E F C G H J L K and Inorder: D B F E A G C L J H K.
g) Construct an expression tree from a prefix expression: * + a b * c + d e
h) Explain the difference between depth-first and breadth-first traversing techniques at a graph.
i) Explain quick sort & merge sort algorithms & derive their time-constraint relation.
j) Write a program to arrange the list of numbers in ascending order using bubble sort.
k) Design a heap by using the following list of numbers: 30, 60, 51,40, 15, 95, 89, 36
l) Write short note on Krushkal's Algorithm.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Represent a stack and queue in a single one-dimensional array. Write functions for Push, Pop operations on the stack and Add, Delete functions on the queue. **(16)**

Q4 Draw a binary search tree whose elements are inserted in the following order: **(16)**
50, 70, 90, 93, 100, 20, 10, 12, 9, 25, 51, 15, 95

Q5 Design an AVL tree whose elements are inserted in the following order: mar, may, nov, aug, apr, jan, dec, jul, feb, jun, oct, sep. **(16)**

Q6 Give a basic algorithm for searching operation using linear searching and binary searching technique. Find out its time complexity. **(16)**