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

Total Number of Pages : 02 **B.Tech**
BE2106

2nd Semester Back Examination 2018-19
DATA STRUCTURE USING C
BRANCH : CHEM, CIVIL, CSE, ECE, EEE, EIE, ELECTRICAL, IT, MECH
Time : 3 Hours
Max Marks : 70
Q.CODE : F058

Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions :** **(2 x 10)**

a) List out few Application of tree data-structure.
b) Which data structures are applied when dealing with a recursive function?
c) State the difference between arrays and linked list.
d) How can you calculate balance factor of a node in AVL tree?
e) What would be the asymptotic time complexity to add an element in the linked list?
f) For any two different vertices u and v of an Acyclic Directed Graph if v is reachable from u, u is also reachable from v? Analyse it.
g) What are the types of Collision Resolution Techniques and the methods used in each of the type?
h) Classify the Hashing Functions based on the various methods by which the key value is found.
i) Define spanning Tree.
j) How many stacks are required to implement a Queue.

Q2 **a)** Write a function to delete a node from a circular linked list. **(5)**
b) Write an algorithm to insert a node into the double linked list. **(5)**

Q3 **a)** Convert the following infix expression to prefix notation **(5)**
E: (A+B*C*(M*N^P+T)-G+H)
b) Evaluate the given prefix expression appended with a left parenthesis at the beginning E: (, -, *, 3, +, 16, 2, /, 12, 6 **(5)**

Q4 **a)** Construct a binary search tree (BST) using list of letters J, R, D, G, T, E, M, H, P, A, F, Q. Find the pre-order, in-order, post-order traversal of the BST created. **(5)**
b) Write a program to arrange the list of numbers in ascending order using quick sort. **(5)**

Q5 **a)** Explain the difference between depth-first and breadth-first traversing techniques at a graph. **(5)**
b) Develop C-segments for array implementation of stack for PUSH & POP operation. **(5)**

Q6 Insert the following nodes in an AVL tree. Nodes are 55, 66, 77, 15, 11, 33, 22, 35, 25, 44, 88, 99 **(10)**

Q7 Write a C program to create a single linked list and split it at the middle and make the second half as the first. Display the final list. **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Abstract Data Type

b) Krushkal's Algorithm

c) Warshall's algorithm