1911000103040001
BCA S.Y. (Sem-III) EXAMINATION
MARCH 2020
Data Structures

Seat No:

Student's Signature

[Time : Three hours]   **[Max.Mark:70]**

Q.1 **Answer in short (any seven)**   14
    1) Define : recursion
    2) List the applications of Link List
    3) Differentiate array and stack.
    4) Find the location of an element [2][3] in 2- D array of size 3X3 in column major representation with starting address 2020.
    5) Write Down the overflow condition of circular queue.
    6) Convert infix notation to prefix notation: $A^{\wedge}B + (C + D^*E)/E$
    7) Define terminal and root node
    8) What is linear data structure? List various linear data structures

Q.2 A) What is sorting? Explain insertion sort in detail   07
                                OR
    A) Explain 2:3 tree in detail   07
    B) What is stack? Write algorithms for the stack operations.   07

Q.3 A) List the types of link list and write algorithms to traverse and insert the node in the middle of circular link list using index of the node.   07
                                  OR
    A) What do mean by searching? Write the difference between binary search and linear search? Write 07 an algorithm for binary search.
    B) Define Queue. List types of queue and write a program for insertion and deletion operation on simple queue.   07

Q.4 A) Construct a symbol tree for the expression $U^{\wedge}V/(W^*X + Y)^{\wedge} Z$ and write its preorder and post order traversal.   07
                                  OR
    A) Write an algorithm to implement dynamic stack.   07
    B) Differentiate static and dynamic memory allocation. Which allocation scheme the array follows? 07 Write algorithm to insert and delete element in an array.

Q.5 **Write a short note on following (any 2)**   14
    1) Tower of Hanoi
    2) Selection sort
    3) Binary search tree

1