RAN-1911040102020001

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MCA 2nd Semester Examination

March / April - 2019

Data Structures

(Old & New)

Time: 3 Hours] **[Total Marks: 70**

સૂચના : / Instructions

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:

☛ **MCA 2nd Semester**

Name of the Subject :

☛ **Data Structures**

Subject Code No.: **1911040102020001**

Seat No.:

Student's Signature

Q.1. **Do as Directed** **[14]**

(A) Answer the following: **[06]**

1. Define: Data Structures
2. Define: Asymptotic Notations
3. A graph with only one isolated node is a tree. True/False
4. An edge of a graph that joins a node to itself is called _____ .
5. Give two applications of stack.
6. The best case of Binary search algorithm is _____ .

(B) Write in detail about various primitive and non-primitive data structures. **[05]**

(C) I Explain iterative and recursive forms of algorithms with an example. **[03]**

Q.2. Do as directed: **[14]**

(A) Convert following infix expression into postfix by using stack table. **[06]**
A*B + C-D/E*F + G

(B) Write an algorithm/code to delete an element X from the circularly linked list with head node. **[5]**

OR

(B) Write an algorithm/code to insert an element after a node X in a circular queue with head node. **[05]**

(C) Draw binary search tree from the given elements. 20, 10, 5, 7, 50,45,75, 65, 80, 3, 1 **[03]**

Q.3. Do as directed: **[14]**

(A) What is expression tree? Make an expression tree for following: (a+b)*(c-d)/(e/f) **[06]**

(B) Explain Threaded Binary Tree in detail with proper example. **[05]**

OR

(B) What is divide-and-conquer strategy? Explain giving examples. **[05]**

(C) Define m-ary tree. **[03]**

Q.4. Do as directed: **[14]**

(A) Explain Binary Search taking an example of array of integers. **[06]**

(B) Explain 2-3 Trees. **[05]**

OR

(B) Explain AVL Trees. **[05]**

(C) State applications of stack. **[03]**

Q.5. Do as directed: **[14]**

(A) What is hashing? Explain any one collision resolution techniques. **[06]**

(B) Sort the following data using Heap sort algorithm.
25, 37, 52, 38, 12, 86, 92 **[05]**

OR

(B) Sort the following data using selection sort algorithm.
25 37 52 38 12 86 92 44 36 20 **[05]**

(C) Define indegree, out-degree and degree of a node in a graph. **[03]**

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