Q.4   What is Binary Tree? Explain Representaton of Binary tree. Also explain different operations that can be performed on Binary tree.

OR

Consider the following eight numbers 50, 33, 44, 22, 77, 35, 60, and 40. Display hte construction of the binary tree by inserting the above numbers in the given order.

Q.5   Sort following element using bubble sort.
　　　　10, 20, 3, 5, 1, 7, 30, 50, 35, 2

OR

Sort the following sequence of keys using merge sort.
　　　　66, 77, 11, 88, 99, 22, 33, 44, 55

---x---

Code No. : C-293

Annual Examination - 2018

B.C.A-II

(BCA-201)

THEORETICAL FOUNDATION

OF COMPUTER SCIENCE

Paper - III

DATA STRUCTURES

Max.Marks : 50

Time : 3 Hrs. _____ **Min.Marks : 17**

Note : Section 'A', containing 10 very short-answer-type questions, is compulsory. Section 'B' consists of short answer type questions and Section 'C' consists of long answer type questions. Section 'A' has to be solved first.

Section - 'A'

Answer the following very short-answer-type questions in one or two sentences :　　　　　　　　**(1×10=10)**

Q.1   Differentiate between data type and data structures.

Q.2   Give examples of Linear and Non-Linear Data Structures.

Q.3   How an array can be accessed using pointer?

Q.4   What is the precondition for binary search?

Q.5   How stack is different from queue?

P.T.O.

Q.6   Define linked list.

Q.7   When insertion sort is efficient?

Q.8   What technique merge sort makes use of?

Q.9   Define the term forest in DS.

Q.10 What are the basic terms associated with tree.

Section - 'B'

Answer the following short-answer-type questions with word limit 150-200 :   **(3 5=15)**

Q.1   Explain different applications of data structures.

OR

List and explain different types of data structures with examples.

Q.2   What are arrays? How are they represented? Also explain sparse matrix.

OR

What is Linear Array? Explain representation of linear array in memory. Consider linear array Year (1935:1985). Find the number of elements in the array.

Q.3   Explain the concept of linked list with diagram. What are the different types of linked list?

OR

Explain push and pop operation in stack.

Q.4   What is a Binary Search Tree (BST)? Make a BST for the following sequence of number 45,36,76,23,89,115,98, 39,41,56,69,48. Traverse the tree in Pre-order, In-order and post-order.

P.T.O.

OR

Write an algorithm for deleting an element from binary search tree.

Q.5   Write an algorithm for selection sort.

OR

Convert the infix (a+b)*(c+d)/f into postfix & prefix expression.

Section - 'C'

Answer the following long-answer-type questions with word limit 300-350 :   **(5 5=25)**

Q.1   Evaluate following postfix expression:
        (i) 5, 6, 2, +, * 12, 4, /,-
        (ii) -, *, 5, +, 6, 2, /, 12, 4

OR

Explain various types of operations in 5 different Data Structures in detail.

Q.2   Calculate the address of X [0, 30] in a 2D array X [-20...20, 10...35] stored in column major order in the main memory. Assume Base Address B = 500.

OR

Explain the binary search algorithm with an example.

Q.3   Explain Queue and write an algorithm to insert and delete an element in Queue.

OR

Write an algorithm to delete the first element in singly linked linked list and explain with an example.

P.T.O.