5. (a) Convert A – B/C + D – E*F to postfix and prefix. **10**

(b) What are applications of stacks in computer science ? **10**

Unit III

6. (a) Make a binary search tree with the following numbers and then traverse the tree in post order : **10**

13, 5, 78, 56, 8, 2, 52, 72, 42, 32, 51, 65

(b) Describe array representation of a binary tree. **10**

7. Write a program in C to implement insertion sort, also write its various time complexities. **20**

8. Describe the following : **20**

(a) Primitive data structures

(b) Binary Search.

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C-162

B.C.A. EXAMINATION, Dec. 2017

(Third Semester)

(Old Scheme) (Re-appear Only)

(BCA)

BCA-203

DATA STRUCTURE USING C

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What is an array ? Give syntax in C to declare an array of pointers.

(b) Describe return type, arguments of Calloc function.

(c) What are advantages of double linked list ?

(d) When implementing circular linked list with arrays what would be the condition for over flow ?

(e) What will be height of a complete binary tree with n number of internal nodes ?

(f) What is the limitation of linear search algorithm ?

(g) What would be prefix notation of (A + B) * (C – D) ?

(h) Define extended binary tree.

(i) Which data structure is used for executing quick sort ? And what is worst time complexity of quick sort ? **20**

(j) What is divide and conquer ? Give example of sorting algorithm that is based on divide and conquer. **20**

Unit I

2. (a) What is a Pointer ? Write a program in C to swap to numbers with the help of pointers. **10**

(b) What is an Array ? What are its properties ? With the help of an array wirte a program in C to reverse a string. **10**

3. What are various categories of data structures ? Explain in detail. **20**

Unit II

4. (a) What is a Queue ? Give some applications of it in computer science. **5**

(b) Compare single linked list with doubly linked list. **5**

(c) What is a stack ? Write algorithm to insert and remove an item from a stack. **10**