

**B.C.A DEGREE END SEMESTER EXAMINATION - MARCH/APRIL 2019**  
**SEMESTER – 2: BACHELOR OF COMPUTER APPLICATION (BCA) (CORE COURSE)**  
**COURSE: 16U2CRBCA6, DATA STRUCTURES USING 'C'**

*(Common for Regular 2018 admission and improvement/supplementary 2017/2016 admission)*

Time: Three Hours

Max. Marks: 75

**PART A**

*Answer **all** questions. Each question carries **1** mark.*

1. Define space complexity of an algorithm with an example.
2. What is the time complexity of Insertion sort in worst, best and average case?
3. Give the prefix form of  $(A-B) + C * D$ .
4. What is Pop () function?
5. What is deque queue?
6. What is deletion anomaly in an array?
7. What you mean by dynamic memory allocation function?
8. Draw a doubly linked list with 2 nodes
9. What is a Heap Tree?
10. What is Depth First search? (1 x 10 = 10)

**PART B**

*Answer **any eight** questions. Each question carries **2** marks.*

11. Explain pointer concept with an example
12. Write GCD function in C using recursion.
13. Explain in detail Binary search.
14. Which among the searching is a better search. Why?
15. Explain the Array representation of Queue.
16. Explain Priority Queue.
17. Explain the concept of singly linked list.
18. Explain the disadvantages of linked list?
19. What do you mean by degree of a node in a tree?
20. Explain preorder traversal of a binary tree with example (2 x 8 = 16)

**PART C**

*Answer **any five** questions. Each question carries **5** marks.*

21. Explain the classification of data structures
22. Explain how selection sort works.
23. Write a program to delete a node in circular linked list.

24. Explain insert & delete function in a queue
25. Convert X: A-B+C-D into postfix notation using stack.
26. Write a C program to sort N numbers using merge sort.
27. Explain different application of stack (5 x 5 = 25)

#### PART D

*Answer **any two** questions. Each question carries **12** marks.*

28. Create a C Program to implement a singly linked list and do the following operations
  - a. Insert at the beginning
  - b. Insert at the end
  - c. Insert at specific location
  - d. Delete a node
29. Explain in detail Binary Tree and Binary Tree traversals.
30. Explain about different types of queue and how to insert and delete in a circular queue
31. Write the algorithm for Bubble Sort and explain the sorting stages of the following list  
L= {-19, 7, 65, 95, 12, 42, 13, 99, -1, 55}. (12 x 2 = 24)

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