Reg. No…….. Name…… **18U230**

B. C. A. DEGREE END SEMESTER EXAMINATION MARCH / APRIL 2018

SEMESTER **– 2 : BACHELOR OF COMPUTER APPLICATION (BCA) CORE COURSE**

COURSE: **16U2CRBCA6 – DATA STRUCTURES USING 'C'**

(Common for Regular 2017 / Supplementary - Improvement 2016 / 2015 Admission)

Time: Three Hours Max. Marks: 75

PART A

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

1. Define Algorithm.
2. What is the time complexity of quick sort algorithm in worst, best and average case?
3. Give the postfix form of (A+B)*C + (A-D).
4. Explain general syntax of malloc () function.
5. Define Stack.
6. What is a priority queue?
7. What is the difference between singly linked list and circular linked list?
8. What are the advantages of linked list?
9. What is a complete binary tree?
10. What is a simple graph? (1 x 10 = 10)

PART B

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

11. What you mean space and time complexity?
12. Distinguish between static and dynamic memory allocation.
13. Give recursive algorithm to find n^{th} Fibonacci no.
14. Compare Linear Search and Binary Search.
15. Explain any two applications of Stack.
16. What is a circular queue? Give a pictorial representation.
17. Give an algorithm to traverse a linked list.
18. Explain representation of binary tree using array with an example.
19. Explain binary search tree with an example.
20. Explain any one method of graph representation using array or linked list (2 x 8 = 16)

PART C

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

21. Explain the classification of data structures with example. Explain recursive algorithm for calculating Binomial Coefficient.
22. Write a C program to sort N numbers using selection Sort.

23. How to implement a Queue using array. Explain basic operations of Queue.
24. Explain different operations on DEQUE.
25. Write an algorithm to construct a singly linked list and search for a data.
26. Compare Breadth First Search and Depth First Search
27. What is meant by Dynamic memory allocation? Explain any three dynamic allocation functions in C. (5 x 5 = 25)

PART D

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

28.
   a. Write the algorithm for Merge Sort and trace Merge Sort algorithm on the list L= {78, 67, 90, 52, 82, 92, 33, 56, 18, 25}.
   b. What is recursion? Explain with an example.

29.
   a. Write an algorithm to convert infix expression to postfix notation. Explain the algorithm using A/B ^C + D*E – A*C
   b. Explain how circular Queue can be implemented? Also explain the basic operations on circular Queue.

30.
   a. Give an algorithm to concatenate two singly linked list.
   b. Explain three cases of deletion operations on doubly linked list.

31.
   a. Discuss different binary tree traversal algorithms with example.
   b. Explain any three applications of Graph. (12 x 2 = 24)

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