

**18U415**

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Name: .....

Reg. No. ....

**FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2020**

(CUCBCSS-UG)

**CC17U CSC4 C04 – DATA STRUCTURE USING C PROGRAMMING**

(Computer Science – Complementary Course)

(2017 Admissions onwards)

Time: Three Hours

Maximum: 64 Marks

**PART A**

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

1. Define data structure.
2. List names of any four linear data structures
3. An n-dimensional array element can be accessed using \_\_\_\_\_ subscripts
4. The process of visiting each and every element of an array for a specific purpose is known as \_\_\_\_\_
5. If the last node of a list points to the first node, then the list is called \_\_\_\_\_
6. Write the postfix expression of the following:  $A + B \times C - D/E$
7. What is Dequeue
8. What is the time complexity of insertion sort?
9. \_\_\_\_\_ sort is an algorithm that works by selecting the smallest element without any interchange of elements from the array and putting it at its correct position.

**(9 x 1 = 9 Marks)**

**PART B**

Answer *all* questions. Each question carries 2 marks.

10. What do you mean by space complexity?
11. Write an algorithm to insert an element at the end of an array.
12. What is a doubly linked list?
13. Write underflow and overflow conditions of a linear queue represented using array?
14. What is the difference between internal and external sorting?

**(5 x 2 = 10 Marks)**

**PART C**

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

15. Give a brief explanation on primitive data types and abstract data types.
16. What are the different types of data structures? Explain
17. Explain how can a sparse matrix be represented in memory.

18. What are the different operations on arrays? Explain.
19. Write an algorithm to create doubly linked list.
20. Write notes on circular linked list.
21. Write and explain recursive procedure to solve towers of Hanoi problem
22. Write a program to search an element in a sorted array with the most time efficient method

**(5 x 5 = 25 Marks)**

#### **PART D**

Answer *any two* questions. Each question carries 10 marks.

23. Write a program to insert elements in different positions of a singly linked list.
24. Explain array and linked list implementation of stack operations.
25. Write algorithm and demonstrate quick sort using the following numbers:

55    44    33    66    77    22    11

**(2 x 10 = 20 Marks)**

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