C 2176 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Computer Science

BCS 4C 04—DATA STRUCTURE USING C PROGRAMMING

(2017 Admissions)

Time : Three Hours Maximum : 64 Marks

Section A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. Define Data Structure.
2. Define complexity of algorithms.
3. Matrices with high proportion of zero entries are called ————.
4. ———— is a list of a finite number n homogeneous data elements.
5. A header linked list always contains a special node called ————.
6. Write one example for linear data structure.
7. If the size of the stack is 10 and we try to add 11^{th} element in to the stack, the condition is called ————.
8. Define a queue.
9. ———— refers to the operation of finding the location of a given item in a collection of items.

(9 × 1 = 9 marks)

Section B

Answer **all** *questions.*

Each question carries 2 *marks.*

10. Differentiate between primitive data types and abstract data types.
11. Briefly explain sparse matrix representation with example.
12. Write a procedure to PUSH an item onto the stack and delete the top item from the stack.
13. Define circular queue and Deque.
14. What is the difference between linear and binary search ?

(5 × 2 = 10 marks)

Turn over

Section C (Short Essay Type)

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

15. Define 2D array. Explain how 2D arrays are represented in memory.
16. What is the difference between a queue and a stack ?
17. Write a program for traversing a linked list with suitable example.
18. What are the applications of stack and queue ?
19. Write the procedure for inserting an element into the array.
20. Briefly explain doubly linked list. Write a program for inserting a new node into a doubly linked list.
21. Explain the working of selection sort.
22. Briefly explain linear search and binary search algorithms. Compare both.

(5 × 5 = 25 marks)

Section D (Long Essay Type)

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

23. Explain any two types of sorting with example.
24. Explain insertion and deletion operations in a queue.
25. Write notes on : a) Header linked list b) Priority queue.

(2 × 10 = 20 marks)