D 31769 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2022

BCA

BCA 3B 04—DATA STRUCTURES USING C

(2019 Admissions onwards)

Time : Two Hours Maximum : 60 Marks

Section A

Short Answer Type Questions.
Answer **all** *the questions.*
Each question carries maximum of 2 *marks.*
Ceiling 20 *marks.*

1. Define data structure.
2. Define string. What is mean by indexed variable in linear array ?
3. Explain different applications of data structures.
4. How to represent two-way linked list ?
5. What is the advantage of using Linked list ?
6. What is priority queue ?
7. Define polish notation.

   Convert following expression to prefix :

   (a) $((a - b)/c - ((d + e)* f)$.

   (b) 15/3 + 4*8 – 18/2.
8. What is mean by overflow in Stack ? Explain.
9. What are binary trees ?
10. What complete binary tree ? Explain.
11. What is weighted graph ? Explain.
12. How to define the data structure of a non-weighted graph ?

Turn over

Section B (Short Essay Type Questions)

Answer **all** *the questions.*
Each question carries 5 *marks.*
Ceiling 30 *marks.*

13. What are the different categories of data structures ? Explain each.

14. Define Big O notation. Explain with examples.

15. Write a program to delete a node from two way linked list using recursive function - pass arguments.

16. Explain circular queue ? Write an algorithm and function to add an element into a circular queue.

17. Write an algorithm to evaluate post fix expression explain with example.

18. Differentiate Tree and Binary tree. Write an algorithm to insert an element as root of the binary tree.

19. What is hashing ? Explain hashing function with suitable examples.

Section C (Essay Type Questions)

Answer any **one** *question.*
Question carries 10 *marks.*

20. (a) What are the different ways to allocate memory in two dimensional arrays ? Explain.

(5 marks)

(b) Write a program to add two sparse matrices using different user defined functions.

(5 marks)

21. (a) Write a program to sort a list of numbers using quick-sort with example, use user defined functions and pass parameters.

(5 marks)

(b) What is directed graph ? Explain how to represent a graph ? Explain (5 marks)

(1 × 10 = 10 marks)