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Name.....

Reg. No.....

**THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2023**

B.C.A.

BCA 3B 04—DATA STRUCTURES USING C

(2019—2022 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type)*All questions can be answered.**Each question carries 2 marks.**(Ceiling 20 marks)*

1. Explain the relevance of Data structure.
2. Which are the two operations on stack.
3. What is the role of a hash function in hashing ?
4. Compare a directed graph and an undirected graph.
5. What is time-space trade off in data structures.
6. Define the Big-O notation.
7. What are the basic properties that a binary search tree (BST) must satisfy.
8. Differentiate between a singly linked list and a two-way linked list.
9. Briefly explain the concept of depth-first traversal.
10. Write a note on pattern matching.
11. Define the term circular queue.
12. Why is time complexity important ?

Turn over

Section B (Paragraph/Problem Type)

*All questions can be answered.
Each question carries 5 marks.
(Ceiling 30 marks)*

13. Explain how linear array is represented in memory.
14. Write a C program to create a singly linked list and perform the following operations :
 - a) Insert a node at the beginning.
 - b) Delete a node with a specific value.
15. Explain how to Design a binary search tree with an example.
16. Explain the concept of hashing and its applications.
17. Explain Exchange sort and its algorithm.
18. Discuss the role of recursion in solving problems. Provide an example of a problem that well-suited for a recursive solution.
19. Describe the applications of linked lists.

Section C (Essay Type)

*Answer any **one** of the following questions.
The question carries 10 marks.*

20. Explain Data structure and its types.
21. Explain the different types of Linked lists with Example.

(1 × 10 = 10 marks)