D 31563 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2022

B.C.A.

BCA 3B 04—DATA STRUCTURE USING C

(2017—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Write short answer on **all** *questions.*
Each question carries 1 *mark.*

1. Name any two linear data structures.
2. Mention different types of linked list.
3. What do you mean by traversing a linked list ?
4. What is a parallel array ?
5. What do you mean by a pointer ?
6. What is a tree ?
7. What is a stack ?
8. Name the data structurethat is used for depth first traversal of a graph.
9. What are the factors by which the performance of an algorithm can be measured ?
10. What do you mean by degree of node in a graph ?

(10 × 1 = 10 marks)

Part B

Write a paragraph on **all** *questions.*
Each question carries 2 *marks.*

11. What is Big O notation ?
12. Explain row major ordering in multidimensional array with an example.
13. Explain with a diagram the concept of two-way linked list.

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14. What is polish notation ? Give an example.
15. What is a circular queue ?
16. Mention the characteristics of a priority queue.
17. Explain the concept of binary search tree.
18. What do you mean by a complete graph ?

(8 × 2 = 16 marks)

Part C

Write short essay on any **six** *questions.*
Each question carries 4 *marks.*

19. Differentiate data type and data structure.
20. Write the algorithm for insertion at the beginning in a singly linked list.
21. Write down the steps for PUSH operation in a stack when the stack is implemented as linked list.
22. Mention any 4 applications of stack.
23. Explain the algorithm for inserting an element in a queue.
24. Explain the concept of hash tables.
25. Write a C program to implement PREORDER traversal in a binary tree.
26. Explain the algorithm for binary search.
27. Explain the concept of directed and undirected graphs.

(6 × 4 = 24 marks)

Part D

Write essays on any **three** *questions.*
Each question carries 10 *marks.*

28. Explain the algorithm and write a C program to implement insertion sort.
29. Explain breadth first search algorithm with an example.
30. Write a C program to implement insertion operation in a binary search tree.
31. Write down the algorithm for insertion and deletion in a circular queue.
32. Write a C program to convert a two-dimensional matrix into sparse representation.

(3 × 10 = 30 marks)