

D 91678

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Name.....

Reg. No.....

**THIRD SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

B.C.A.

BCA 3B 04—DATA STRUCTURE USING C

(2017 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Write short answer on all questions.

Each question carries 1 mark.

1. What is an Array ?
2. What is a Graph ?
3. What is a Queue ?
4. What is a circular singly linked list ?
5. What is a full binary tree ?
6. Give the name of the searching algorithm that follows divide and conquer strategy.
7. Name different types of tree traversals.
8. How will you calculate hash function in division method ?
9. What is pattern matching ?
10. What is the necessary requirement for a binary search algorithm to work ?

(10 × 1 = 10 marks)

Part B

Write a paragraph on all questions.

Each question carries 2 marks.

11. What is a non-linear data structure ? Give examples.
12. Explain the string functions strcmp() and strlen().
13. Explain column major ordering in multidimensional arrays.

Turn over

14. How can you represent a sparse matrix using 2D array. Illustrate with an example.
15. How to implement queue as a linked list ?
16. What is a weighted graph ?
17. What is depth first search ?
18. What are parallel arrays ?

(8 × 2 = 16 marks)

Part C

*Write short essay on any **six** questions.*

Each question carries 4 marks.

19. Explain the space complexity of an algorithm.
20. Write down the algorithm for deleting an element at the beginning of a singly linked list.
21. Explain some applications of linked list.
22. Explain how recursion can be implemented using a stack.
23. Explain the algorithm for deleting an element from a queue.
24. Explain different types of priority queue.
25. Write a C program to implement POSTORDER traversal in a binary tree.
26. Explain the steps for searching in a binary search tree.
27. Write a C program for exchange sort.

(6 × 4 = 24 marks)

Part D

*Write essays on any **three** questions.*

Each question carries 10 marks.

28. Explain push and pop operations on stack.
29. Explain the insertion and deletion operation in a singly linked list.
30. Explain selection sort with illustration.
31. Explain linear search algorithm with an example.
32. Explain with an example, the adjacency matrix representation of a) Directed graph ; b) Undirected graph ; and c) Multigraph.

(3 × 10 = 30 marks)