

D 71615

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Name.....

Reg. No.....

THIRD SEMESTER B.A./B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

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. Define Data Structure.
2. List out the derived data types in C.
3. What is meant by indexed variable in linear array ?
4. How to represent two-way linked list ?
5. Define polish notation.
6. Convert following expression to prefix :
(a) $((c - b)/d - ((e + f) * g).$ (b) $24/6 - 3 * 7 - 6 + 10/2.$
7. What is meant by degree of a node ? with example.
8. Clarify whether Linked List is linear or Non-linear data structure ?
9. What is weighted graph ? Explain.
10. How to define the data structure of a non-weighted graph ?

(10 × 1 = 10 marks)

Part B

Write a paragraph on all questions.

Each question carries 2 marks.

11. Briefly describe the notation of the space-time trade off of algorithm.
12. List out the applications of data structures.

Turn over

13. What will happen in a C program when you assign a value to an array element whose subscripts exceed the size of array ? Explain with example.
14. Write an algorithm to perform insertion operation in queue.
15. What is priority queue ?
16. Write the following prefix notation to expression tree in step by step.
* + + abc + + def
17. Write a program to sort a list of numbers in ascending order using Bubble. Explain.
18. How the depth first traversal algorithm works ? Explain.

(8 × 2 = 16 marks)

Part C

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

19. What are the different string operations ? Explain each with example.
20. Explain different categories of data structures.
21. Write an algorithm to insert an element into a linear linked list.
22. Write a program to delete more than one element from a one dimensional array, use user defined functions.
23. What are circular queues ? Write down functions for deleting elements from a circular queue implemented using array.
24. What is a singly linked list ? Write a program to insert an element and search an element in a singly linked list.
25. What are binary trees ? Explain how it is represented in memory.
26. Write a program to sort a list of numbers using Selection. Use user defined functions. Pass parameters, check all validations.
27. Compare binary search and linear search.

(6 × 4 = 24 marks)

Part D

Write essays on any **three**.

Each question carries 10 marks.

28. (a) Write the pattern matching algorithm with example. (5 marks)
(b) Write a program to add two sparse matrices using different user defined functions. (5 marks)
29. (a) Define circular linked lists. Write an algorithm to insert elements at the middle of a circular linked list. (7 marks)
(b) What are the different applications of tree ? Explain. (3 marks)
30. What is insertion sort ? Write a program sort the following array using quick sort method.
20 76 87 31 12 96 84 (10 marks)
31. (a) Explain different traversal methods in binary tree. (6 marks)
(b) With an example, explain the algorithms of evaluation of postfix expression. (4 marks)
32. (a) Define Hashing. Explain the different hash functions. (5 marks)
(b) What is binary search tree ? Write an algorithm to find an element from an array of elements. (5 marks)
- [3 × 10 = 30 marks]