D 51253-A (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2018

(CUCBCSS)

BCA 3B 04—DATA STRUCTURE USING C

Time : Three Hours Maximum : 80 Marks

Part A

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

1. In what areas do Data Structures are applied ?
2. What is a Data ?
3. What is meant by subscripted variable in linear array ?
4. Explain Logical representation of linked list.
5. Why we call stack is a linear Data Structure ? Explain.
6. Convert following infix expression to postfix expression :

   (a) ((a + b)/d–((e-f)+g). (b) 12/3*6+6–6+8/2.
7. What is strictly binary tree ?
8. Define forest. Also give example of it.
9. What is undirected graph ? Explain.
10. Define unordered linear search.

(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 steps involved in the development of an algorithm.
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 pop operation.
15. What is priority queue ?
16. Write the following prefix notation to expression tree in step by step.

    +, *, 2, 6/ , 3, 8.

Turn over

17. Write a program to sort a list of numbers in descending order using Bubble. Explain.

18. When we called a graph is complete ? Explain.

(8 × 2 = 16 marks)

Part C

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

19. List out areas in which Data Structures are applied. Explain with example.

20. What are the different string operations ? Explain each with example.

21. What is column major order ? Explain how it is represented in memory and calculate the address of an element.

22. Write a program to insert more than one element into a one dimensional array, use user defined functions.

23. What are circular queues ? Write down functions for inserting and deleting elements from a circular queue implemented using arrays.

24. Write algorithm for push and pop operation on a linked stack.

25. What is expression tree ? Represent the following expression using a tree. Comment on the result that you get when this tree is traversed in Preorder, Inorder and Postorder.

    (a–b)/((c*d)+e).

26. What are binary trees ? Explain how it is represented.

27. Define Hashing. Explain the different hash functions.

(6 × 4 = 24 marks)

Part D

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

28. (a) Differentiate between linear and non-linear Data Structure.

(4 marks)

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

(6 marks)

29. (a) Define two-way lists. Write an algorithm to insert elements at the middle of a circular linked list.

(5 marks)

(b) What are the different applications of queue and stack ? Explain.

(5 marks)

30. What is exchange sort ? Write algorithm and Sort the following array using exchange Sort method.

    24 56 47 35 10 90 82.

31. With an example, explain the algorithms of inorder to postorder traversal.

32. (a) Compare binary search and linear search.

(4 marks)

(b) Write a program to implement singly linked list using user defined functions.

(6 marks)

[3 × 10 = 30 marks]