D 92255

(Pages : 3)

Name.................................

Reg. No.............................

THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2015

(CUCBCSS – UG)

Core Course

BCA 3B 04—DATA STRUCTURES USING C++

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer **all** questions.*
Each question carries 1 mark.

1. The number of elements in an array a[l :u] could be determined by :

    (a) $(u + I + 1)$.

    (b) $(u + l + 2)$.

    (c) $(u - l + 1)$.

    (d) $(u - 1 + 2)$.

2. Sparse matrices have :

    (a) No zero.

    (b) Many zeroes.

    (c) Higher dimension.

    (d) None of the above.

3. Which of the following data structure can't store the non-homogenous data elements :

    (a) Records.

    (b) Arrays.

    (c) Files.

    (d) Linked lists.

4. A data structure where elements can be added or removed at either end but not in the middle :

    (a) Stack.

    (b) Queue.

    (c) Linked list.

    (d) Deque.

5. Which of the following is a two-way list :

    (a) Singly linked list.

    (b) Circular list.

    (c) Linked list with head node.

    (d) None of the above.

6. Node which is of degree zero is called :

    (a) Root node.

    (b) Terminal node.

    (c) Non-terminal node.

    (d) None of the above.

7. You can remove an element from a queue's ————————

    (a) Top.

    (b) Front.

    (c) Bottom.

    (d) Rear.

Turn over

D 92255

8.   The maximum number of nodes in a binary tree of depth k *is* :

     (a) 2k – 1.   (b) $2k^{-1}$.

     (c) $2 * (k - 1)$.   (d) $2k^{-2}$.

9.   Which of the following is useful in traversing a graph in breadth first search :

     (a) Stack.   (b) Queue.

     (c) Linked list.   (d) Tree.

10. Adjacency lists are used for ————————

     (a) Stack representation.   (b) Queue representation.

     (c) Graph representation.   (d) Array representation.

                                                            (10 x 1 = 10 marks)

Part B

Answer **all** *questions.*
Each question carries 2 *marks.*

11. What is an abstract data type ?

12. What is time complexity ?

13. Discuss about pointer arrays.

14. What are the applications of queues ?

15. Discuss indexed searching.

                                                            (5 x 2 = 10 marks)

Part C

Answer any **five** *questions.*
Each question carries 4 *marks.*

16. Discuss the various approaches to algorithm design.

17. Explain recursion with an example.

18. Discuss array as an abstract data type.

19. Explain the way to represent a sparse matrix using arrays.

20. What is a queue ? What are its applications ?

21. Explain the bubble sort technique.

22. Describe the different methods to represent binary tree in memory.

23. Explain binary search.

                                                            (5 x 4 = 20 marks)

Part D

Answer any **five** *questions.*
Each question carries 8 *marks.*

24. What is an algorithm ? Explain the performance analysis of algorithms.

25. Differentiate between static and dynamic data structures.

26. What is an array data structure ? Explain the representation of arrays in memory.

27. What is a stack ? Write a program to implement a stack using array.

28. What is a circular queue ? Write the algorithms for insertion and deletion operations on a circular queue.

29. Discuss the application of graph structures. What are the different methods to traverse graphs ?

30. Write a program to implement heap sort. Explain.

31. What is hashing ? Explain the different hash functions.

(5 ×   = 40 marks)