D 51252   (Pages : 3)   Name...

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

(CUCBCSS—UG)

Core Course

BCA 3B 04—DATA STRUCTURES USING C++

(2014 Admissions)

Time : Three Hours   Maximum : 80 Marks

Part A

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

1. The total number of nodes in the binary tree which has of level five is :

    (a) 32.   (b) 16.

    (c) 31.   (d) 64.

2. Data structures are used for BFS :

    (a) Struct.   (b) Queue.

    (c) Stack.   (d) Array.

3. Which is the postfix notation of $((A * (B + C))/D)$:

    (a) A B C + * D /.   (b) AB + C * D/.

    (c) ABC D * /.   (d) ABCD / * +.

4. _____is a name of abstract data type.

    (a) Array.   (b) Class.

    (c) Enumerated.   (d) File.

5. Two main measures for the efficiency of an algorithm are :

    (a) Processor and memory.   (b) Complexity and capacity.

    (c) Time and space.   (d) Data and space.

6. If h is any hashing function and is used to hash n keys in to a table of size m, where $n <= m$, the expected number of collisions involving a particular key x is :

    (a) Less than 1.   (b) Less than n.

    (c) Less than m.   (d) Less than $n/2$.

Turn over

7. Which of the following is false about a binary search tree ?

    (a) The left child is always lesser than its parent.

    (b) The right child is always greater than its parent.

    (c) The left and right sub-trees should also be binary search trees.

    (d) None of the mentioned.

8. What is the time complexity of inserting a node in a doubly linked list ?

    (a) O(nlogn).   (b) O(logn).

    (c) O(n).   (d) O(1).

9. What is a sparse array ?

    (a) Data structure for representing arrays of records.

    (b) Data structure that compactly stores bits.

    (c) An array in which most of the elements have the same value.

    (d) None of the mentioned.

10. Which of the following properties does a simple graph not hold ?

    (a) Must be connected.

    (b) Must be un weighted.

    (c) Must have no loops or multiple edges.

    (d) All of the mentioned.

(10 × 1 = 10 marks)

Part B

Answer all questions.
Each question carries 2 marks.

11. What are linear and non linear data Structures ?

12. What is algorithm ?

13. Discuss about the memory management of one dimensional array.

14. What is sparse matrix ?

15. Represent a queue with 10 elements.

(5 × 2 = 10 marks)

Part C

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

16. What are the various operations that can be performed on different Data Structures ?

17. What is a Queue, how it is different from stack and how is it implemented ?

18. Discuss about the implementation of priority queue ?

19. Define array ? Explain about various types of arrays with memory allocation ?

20. How polynomial represented in dynamic management system. Write algorithm for adding two polynomials.

21. Discuss about De-queue and Priority Queue.

22. Write a program to find an element using binary search concept.

23. Define graph data structure ? Discuss about its applications ?

(5 × 4 = 20 marks)

Part D

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

24. What are the different binary tree traversing techniques.

25. Write an algorithm for insertion sort ?

26. Discuss about insertion and deletion algorithms of queue.

27. Compare merge sort and radix sort.

28. Write a program to find transpose of a sparse matrix.

29. Write an algorithm to implement quick sort. Explain it with an example.

30. Write an algorithm to insert nodes into doubly linked list.

31. What are the various data representation methods.

(5 × 8 = 40 marks)