

15U323

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Name:

Reg. No.....

THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2016

(CUCBCSS - UG)

CC15U BCA3 B04- DATA STRUCTURES USING C++

(Core Course)

(2015 Admission)

Time: Three Hours

Maximum: 80 Marks

PART A

(Answer *all* questions)

1. What do you mean by structured programming approach?
2. Expand ADT
3. Give an example of a static data structure.
4. What are sparse matrices?
5. Given an empty stack, after performing Push (1), Push (2), Pop, Push (3), Push (4), Pop, Pop, Push (5), Pop, what is the value of the top of the stack?
6. What is the advantage of postfix expression over infix expression?
7. Give any one application of queue.
8. Define height of a tree.
9. What do you mean by a cycle in a graph?
10. What is the best case time complexity of quick sort?

(10 x 1 = 10 Marks)

PART B

(Answer *all* questions)

11. Differentiate between linear and non linear data structures with examples
12. Explain the representation of one dimensional array in memory.
13. Write short notes on circular linked lists.
14. What is a priority queue? Give an application of it.
15. What are the properties of a complete binary tree?

(5 x 2 = 10 Marks)

PART C

(Answer *any five* questions)

16. Explain the concept of recursion with an example.
17. What is the advantage of postfix expressions over infix? Give the postfix expression for $d / (e+f)^b * c$.
18. How will you perform insertion and deletion in a queue?

19. Write an algorithm to perform binary search.
20. Explain insertion sort with an example.
21. Write short note on graphs and its applications.
22. Explain minimum spanning trees with an example?
23. Explain collision handling techniques in hashing.

(5 x 4 = 20 Marks)

PART D

(Answer *any five* questions)

24. What are the advantages of linked list over arrays? Explain various operations performed on singly linked lists.
25. What are the applications of a stack? Write an algorithm to perform PUSH and POP operations in a stack?
26. Explain the algorithm for converting an infix expression to its postfix equivalent.
27. Explain the representation of polynomials using linked list. Write an algorithm to add two polynomials.
28. Explain Binary Search Trees and algorithm to insert elements into a BST. Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?
29. What do you mean by hashing? Explain various hash functions in detail.
30. Discuss merge sort algorithm with suitable example.
31. Explain Prim's algorithm for finding MST with suitable example

(5 x 8 = 40 Marks)
