

**ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE**  
**B.E. /B.TECH. DEGREE EXAMINIATIONS: NOV / DEC 2010**

**REGULATIONS: 2008**

**THIRD SEMESTER: ECE**

**080290009 - DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING IN C++**

**TIME: 3 Hours**

**Max. Marks: 100**

**PART-A**

**(20 x 2 = 40 MARKS)**

**ANSWER ALL QUESTIONS**

1. Give the structure of a C++ program.
2. Define an object. Give its relationship with a class.
3. Give the functions of a new and delete operators.
4. What is the dot operator and what for it is used?
5. List out the different types of inheritance
6. Mention some of the stream classes.
7. What are the insertion and extraction operators? Give their functions.
8. What is an exception? What information an exception may contain?
9. Why we need to analyze the time complexity of an algorithm?
10. What is an ADT? List some of the ADTs.
11. Convert into postfix notation:  $4*2+7-3$
12. What is a priority queue? Give its applications?
13. Define AVL tree.
14. What is a graph? Define Topological sort.
15. Define minimum spanning tree.
16. What is an NP-complete Problem? Give two examples.
17. Write the running time for
  - i. Insertion sort
  - ii Shell sort

18. Define divide and conquer technique.
19. Write the working principle of Greedy Algorithm.
20. Compare single source shortest path algorithm with All -Pairs shortest path algorithm.

**PART- B**

**(5 x 12 = 60 MARKS)**

**ANSWER ANY FIVE QUESTIONS**

21. (a) Explain the basic concepts of OOP. (8)  
(b) Explain the functions of standard input and output streams in C++ with example (4)
22. (a) Describe different types of constructors and destructor with suitable programming examples in C++ (8)  
(b) Explain the process or overloading various operators with examples. (4)
23. (a) Define inheritance. Explain various types of inheritance with examples. (8)  
(b) Describe the possibilities of occurrences of an exception. (4)
24. (a) Explain stack ADT. Write programs to implement stack operations. (6)  
(b) What is a queue ADT? Explain the process of array implementation of queue. (6)
25. (a) Explain the various tree traversal algorithms. (6)  
(b) Explain the operations with a binary search tree. (6)
26. (a) What is called Hashing? Write a program to implement separate chaining hash table. (8)  
(b) Explain the Linear probing method of hashing. (4)
27. (a) Explain any two internal sorting algorithms with example. (8)  
(b) Explain anyone external sorting algorithm with example. (4)
28. (a) Trace the Prim's algorithm to find out the minimum spanning tree with example. (12)

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