

ANNA UNIVERSITY:: CHENNAI

B.E. / B.Tech. (Full Time) DEGREE ARREAR EXAMINATIONS, APR / MAY 2012

COMPUTER SCIENCE & ENGINEERING BRANCH

THIRD SEMESTER (REGULATIONS 2008)

CS9211 – DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING IN C++

Time : 3 Hrs.

Max. Marks : 100

Answer ALL Questions

PART – A (10 X 2 = 20 Marks)

1. Compare the class of C++ with structure of C.
2. What is inline function? Give example.
3. Can a class be a member of another class? Justify your answer.
4. What is the significance of a friend function?
5. What is the purpose of using ADTs in programs?
6. What are the necessary conditions to check for performing insertion and deletion operations on a Queue?
7. Convert the following into an expression tree: $(a + b) * (c / d) - e / f$.
8. Write how extendible hashing is better than rehashing.
9. With a simple example demonstrate the ways of representing a Graph.
10. What is greedy algorithm? Mention any one problem that uses this algorithm design technique.

PART – B (5 X 16 = 80 Marks)

11. Consider a class network of Fig. 11. The class *master* derives information from both *account* and *admin* classes which in turn derive information from the class *person*. Define all the four classes and write a program to create, update and display the information contained in *master* objects. [16]

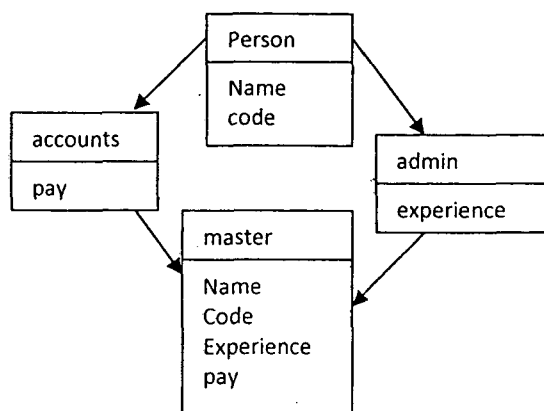


Fig. - 11

12. a) Write a C++ program to perform complex numbers addition, subtraction and result display operations, using constructors and destructors; member and friend functions and an operator overloading function appropriately. [16]

Or

- b. i) Illustrate the concept of virtual functions with an example. [6]
ii) Illustrate the different kinds of class type conversions with example. [10]

13. a) Write a program to store the polynomial expression terms in random order, display the terms in descending order of powers and count the number of terms in the expression using a doubly linked list. [16]

Or

- b) Write a program to convert an infix expression to a postfix expression and evaluate that postfix expression. [16]

14. a) i) Construct a binary search tree by inserting 3,1,4,9,6,5,2,8,7 into an initially empty tree. Show the results of splaying the nodes 1,6 and 7 one after the other of the constructed tree. [10]
ii) Explain binary heap that has a max-value at the root. [6]

Or

- b) i) Show the results of inserting 4,1,2,5,6,7,3 into an initially empty AVL tree. [8]
ii) What is collision in terms of hashing? Explain any three collision resolution methods with example. [8]

15. a) i) Explain greedy algorithm by solving the problem of single source shortest path of a digraph using Dijkstra's algorithm. [10]
ii) Explain shell sort algorithm with an example. [6]

Or

- b) i) Explain divide and conquer method of solving problems using suitable example. [10]
ii) Illustrate with an example the insertion sort algorithm to sort a list of elements in ascending order. [6]