B.E /B.TECH. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APR./MAY.2013

CSE / IT DEPARTMENT

III SEMESTER

CS9203 PROGRAMMING AND DATA STRUCTURES II

(REGULATION 2008)

Time: 3 hour   Max.Mark:100

Answer ALL Questions

Part-A (10 X2=20 marks)

1) State any two differences between copy constructor and assignment operator.
2) What are Const objects and how can it be accessed?
3) Can the assignment operator (=) be overloaded as friends? Justify ?
4) What do you mean by Large object?
5) What are the disadvantages of multiple inheritance?
6) State any two instances to use virtual function instead of normal function.
7) Consider a scenario of selling the services of a machine over a fixed time period(day or month). Each user pays a fixed amount per use but the time needed by each user is different. Specify a suitable data structure to maximize the earning from this machine.
8) Compare and contrast AVL tree and Red-Black tree based on performance.
9) State the data structure and its two useful operations to determine the connected components of an undirected graph.
10) What do you mean by spanning tree and minimum spanning tree?

Part -B(5 X 16 =80 Marks)

11.a Write a C++ program to create 3 X 3 matrix template class to perform the following operations.   (16)
    i) Add two matrix
    ii)Multiply 3 * M1
    (iii)Increment M1++, ++M1
    iv)Display matrices using >>,<< operators

12.a (i)Write a program that takes an integer from the base class and converts it in to binary, octal and hexadecimal number through derived classes. The member functions of the class shares the same name and invoked via base class pointer.   (8)
    (ii)Write a C++ program to perform Insert, copy, compare, concat, clear, extract operations on String class.   (8)

(Or)
b. (i)What are the different forms of inheritance and choose the suitable form of inheritance to implement the Figure 1.   (10)
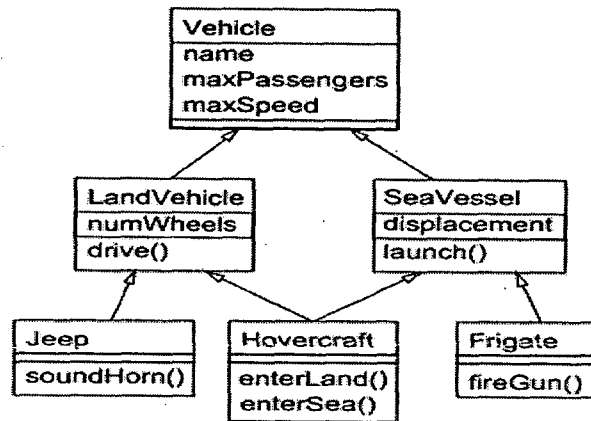
Figure. 1

(ii)Write a C++ program to provide "safe array" operations using array subscript operator for queue class. (6)

(Or)

13.a (i)Write a class The exception which contains member functions for displaying messages regarding stack underflow and stack overflow, and when overflow occurs ,it asks for increasing the stack size. Use dynamically allocated array to implement stack. (10)

(ii)Write a program to determine which type (derived class) of objects is pointed by a base class pointer. (6)

(Or)

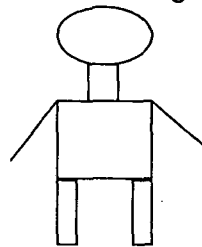b. (i)Write a program that to draw the following figure 2 on the frame. (10)

Figure. 2

(ii)Write a program to show explicitly when and where the copy constructor will be is invoked implicitly. (6)

14.a Write a program to implement the binary search tree with the following added functions.
(i) Insertion (ii) tree traversals (iii) find mirror image of a given binary search tree (16)

(Or)

b. Write a program that constructs a height balanced tree by performing single rotations and double rotations during insertion and deletion operations. (16)

15.a Write a program that determines minimum spanning tree of an undirected graph using prim's algorithm. Illustrate with example. (16)

(Or)

b. (i)Write a program to perform topological sort (8)

(ii)Write a program to determine articulation points in an undirected graph (8)