CS 162 Exam II Spring 2018 FORM 1

Please put your name and form number on the scantron.

True (A)/False (B) (28 pts, 2 pts each)

1. All operators can be overloaded.
   F

2. You cannot create new operators (such as the quote).
   T

3. If you use the keyword virtual in a function declaration, you must also use it in the function definition.
   F

4. The destructor is inherited from the base class.
   F

5. All member functions in a base class should be listed as virtual functions.
   F

6. The derived class may define variables and member functions other than those that are in the base class.
   T

7. If the member variables in a base class are marked as private, the derived class directly access those variables.
   F

8. A base class pointer variable can point to derived class objects only.
   F

9. If a function throws an exception, it must be caught inside that function.
   F

10. In a try block, the throw statement is always executed.
    F

11. The catch block is the group of statements that handle an exception.
    T

12. If a throw list has multiple exceptions listed, they are separated by semicolons.
    F

13. A class that has a pure virtual member function is called a concrete base class.
    F

14. If your program defines a class template, then the compiler will generate a class for each different data type for which it is instantiated.
    T

Multiple Choice (72 pts, 3 pts each)

15. A ________ function is not a member of the class, but has access to the private members of the class.
   a. Parent
   b. Child
   c. Friend
   d. Leech

16. Operators can be overloaded as
    a. friends of a class
    b. members of a class
    c. non-friends, non-members of a class
    d. All of the above

17. If the member variables of the base class are marked as protected, who can access those variables?
   a. Users
   b. Other programs
   c. Derived classes
   d. All of the above
18. The ability to associate multiple meanings to one function name using dynamic binding is called
   a. Inheritance
   b. Object Oriented
   c. Polymorphism
   d. Inconsistency

19. A base class may have at most ________ child class derived from it.
   a. 1
   b. 2
   c. 12
   d. any number

20. Which is the correct way to tell the compiler that the class being declared (ChildClass) is derived from
   the base class (BaseClass)?
   a. class ChildClass::public BaseClass
   b. class ChildClass::public BaseClass
   c. class ChildClass childOf public BaseClass
   d. class ChildClass derived BaseClass

21. In the derived class definition, you list from the base class
   a. all the member functions every time
   b. only those member functions that need to be redefined
   c. only those member functions that were in the public section
   d. only those member functions you want to overload.

22. Using inheritance allows us to
   a. eliminate duplicate code
   b. make our classes more modular
   c. use polymorphism
   d. all of the above
   e. none of the above

23. Which of the following are not true
   a. an object of the derived class may be stored in a variable of the base class
   b. an object of the base class may be stored in a variable of the derived class
   c. an object of a derived class that is derived from another class that is derived from a third class
      can be stored in a variable of the third class.
   d. all of the above
   e. none of the above

24. If you have a copy constructor in the base class, but do not have a copy constructor for the derived class,
   then
   a. you will have a syntax error
   b. a copy constructor for the derived class is automatically created for you
   c. you cannot use pointer variables
   d. the default constructor is used
25. Which of the following would correctly call the base class (BaseClass) assignment operator from the derived class (DerivedClass) assignment operator?

DerivedClass& DerivedClass::operator =(const DerivedClass& rightSide)
{
    //what goes here?
}

a. BaseClass::operator=(rightSide);
b. leftSide=rightSide;
c. rightSide=BaseClass::rightSide;
d. DerivedClass::rightSide=BaseClass::rightSide;

26. If the following function is in a base class, which of the following are polymorphic declarations of the same function in the derived class?
   
   virtual void print(ostream& out);

   a. virtual void print (ostream& out);
   b. void print(ostream& out);
   c. void print();
   d. virtual void print();
   e. A and B

27. If a base class has a non-virtual member function named print, and a pointer variable of that class is pointing to a derived object, then the code ptr->print(); calls

   a. the base class print function
   b. the derived print function
   c. both the derived and base print functions
   d. it causes a run-time error

28. The catch block
    catch (...) 

    is known as the ______________.

   a. Default catch block
   b. A syntax error
   c. The ellipses block
   d. None of the above

29. If the following function throws an unhandled exception, what happens?
    void f1() throw ( );

   a. The program will exit
   b. the exception will propagate to the calling program or function
   c. The program will hang
   d. None of the above
30. If you define a function in the derived class that has the same function signature as a function in the base class, this is known as
   a. overloading
   b. redefinition
   c. overwriting
   d. a syntax error

31. A catch block that expects an integer argument will catch
   a. all exceptions
   b. all integer exceptions
   c. any exception value that can be coerced into an integer
   d. none of the above

32. If you want to make a function a template function, you must precede the function declaration and definition with
   a. template
   b. template <class int>
   c. template <class T>
   d. template <void>

33. Which of the following describes a class that would be a good candidate for conversion to a template class?
   a. A class which defines a new type of array
   b. A class which defines rational numbers
   c. A class which defines customers for a store
   d. All of the above

34. If you define some list class template in your program, and then declare a list of integers, 2 lists of doubles and 1 list of strings, how many different versions of the template class will the compiler provide?
   a. 1
   b. 2
   c. 3
   d. 4

35. Which of the following is an incorrect declarations of iterators for STL containers? You may assume that the proper header has been included and that a using directive makes the names from namespace std available.
   a. vector<int>::iterator vecIterator;
   b. list::iterator<int> listIterator;
   c. deque<int>::iterator dequeIterator;
   d. list<int>::iterator listIterator;

36. To add an element to a vector of integers named numbers at the next available position in the vector, you would use:
   a. numbers[numbers.size()+1] = newValue;
   b. numbers = newValue;
   c. numbers.push_back(newValue);
   d. numbers.push_back(newValue);
37. Which of the following operations do forward iterators have?
   a. Overloaded operator+ to add an int value to the iterator to move the place the iterator points forward by the argument number of elements.
   b. Overloaded operator* to multiply the iterator by an int value to move the place the iterator points by a number of elements equal to the argument.
   c. Overloaded operator++ to move the place the iterator points forward by one element.
   d. Overloaded operator-- to move the place the iterator points backward by one element.

38. Given the following declarations, which statement would put the value of 3 in the item part of the first node in the linked list?
   struct Node {
       int item;
       Node *link;
   };
   Node *head;
   head = new Node;
   a. head=3;
   b. head.item=3;
   c. *head.item=3;
   d. head->item=3;

Extra Credit (2 pts each)

39. Given the function below, which of the following are needed to change the function into a function template?

   int smallest( int array[], int size)
   {
       int small=0, i;
       for(i=0;i<size;i++)
       {
           if(array[i] < array[small])
               small=i;
       }
   return small;
   }
   a. precede the function definition with template <class T>
   b. change the type of the array to T
   c. change all occurrences of int to T
   d. All of the above
   e. A and B
40. True(A)/False(B): The STL containers each define iterators appropriate to the internal structure of the container.

41. In Linked Lists, the pointer variable head
   a. is the first node in the list
   b. points to the first node in the list
   c. is always NULL
   d. is undefined

42. We generally set a pointer variable to NULL
   a. to signify that the pointer does not point to any memory
   b. because we want all our pointers to always point to NULL
   c. never

43. Given the following search function declaration, what would be the corresponding declaration for a templated search function?

   int search( int array[], int start, int target, int size);

   //pre: start is > 0, and < size
   //the position of the first occurrence of target at or after start is returned, or -1 is returned.

   a. template <class T>
      int search(int array[], int start, T target, int size);
   b. template <class T>
      T search(T array[], T start, T target, T size);
   c. template <class T>
      int search(T array[], int start, T target, int size);
   d. template <class T>
      int search(T array[], T start, T target, T size);
   e. all of the above