FORM 1(put name, form, and section number on scantron!!!)

CS 162 Exam I

True (A) / False (B) (2 pts)

1. What value will the function `eof` return if there are more characters to be read in the input stream?

2. It is possible for a structure variable to be a member of another structure variable.

3. What will `inFile.fail( )` return if the file associated with the stream `inFile` cannot be opened?

4. The data members of a class are usually placed in the private section of a class.

5. The expression `s->m;` indicates that `s` is a structure pointer and `m` is a structure member.

6. If the implementation of a member function calls another member function, you do not need to use dot notation.

7. A constructor cannot specify a return type.

8. The implementation of the member functions cannot access the private section of the class.

9. Object-oriented design first identifies the objects required in a problem.

10. In object-oriented design, it is considered a correct procedure to implement a little, then test.

11. When passing a file stream object to a function, you should always pass it by reference.

12. You must use the `private` access specification for all data members of a class.

13. By default, when an object is assigned to another, each member of one object is copied to its counterpart in the other object.

14. A static member variable can be used when there are no objects of the class in existence.

Multiple Choice (3 pts):

15. A class may have this many default constructor(s).
    A) at most one
    B) more than one
    C) a maximum of two
    D) any number
    E) None of these

16. Which of the following assigns a value to the `hourlyWage` member of `employee[2]`?
    A) `employee[2]->hourlyWage = 50.00;`
    B) `employee2.hourlyWage = 7.50;`
    C) `hourlyWage[2].employee = 29.75`
    D) `employee[2].hourlyWage = 100.00;`
    E) None of these

17. Passing a structure as a constant reference parameter to a function _____.
    A) can potentially result in changes to the structure's members
    B) guarantees not to result in changes to the structure's members
    C) will always change the structure's members
    D) All of these
    E) None of these

18. This data type can be used to create files and write information to them but cannot be used to read information from them.
    A) `ofstream`
    B) `ifstream`
    C) `afstream`
    D) `outstream`
    E) None of these

19. Class type declarations (the class interface) are usually stored here.
    A) on separate disk volumes
    B) in their own header files
    C) in .cpp files, along with function definitions
    D) under pseudonyms
    E) None of these

20. A class is a(n) _____ that is defined by the programmer.
    A) data type
    B) function
    C) method
    D) attribute
    E) None of these

21. If the compiler encounters the line
```
#ifndef BUTTON_H
```
    for the first time, it will:
    A) skip all the lines up to and including `#endif`
    B) look for the file `button.h`
    C) go to the next line
    D) do nothing

22. Which is the best prototype for a member function of a `person` class that returns true if the `person` object's age is greater than that of another `person` object. Assume that age is a data member of the `person` class.
    A) `bool isOlderThan (const person &p) const;`
    B) `bool isOlderThan (person &p) const;`
    C) `bool isOlderThan (person p) const;`
    D) `bool isOlderThan (const person &p);`

23. The first line of the implementation file `time.cpp` for a class called `Time` could be:
    A) `#ifndef TIME_H`
    B) `#include "time.h"`
    C) `using namespace std;`
    D) `Time::Time (int, int);`

24. What is the code that associates the input file stream `inf` with the file myFile.txt?

A)
```
…
ifstream myFile.txt;
inf.open (myFile.txt);
```

B)
```
#define aFile myFile.txt
      …
ifstream aFile;
inf.open (aFile);
```

C)
```
#define aFile “myFile.txt”
…
ifstream inf;
inf.open (aFile);
```

D)
```
#define aFile “myFile.txt”
 …
ifstream inf;
inf.open (myFile.txt);
```

25. In the header file of a `person` class, which of the following is the default constructor?

A) `person ();`
B) `person (int, int);`
C) `person::person ( );`
D) `person person1;`

26. A function that retrieves the value of a data member is called a(n):

A) modifier
B) accessor
C) constructor
D) default constructor

27. If `menu_button` is an object of a class called `button` with a member function called `get_color` which has no parameters, a correct function call is:

A) `get_color( )`
B) `button.get_color`
C) `button.get_color( )`
D) `menu_button.get_color( )`

28. The word const after the end of a member function’s heading means:

A) the function does not change any variables
B) the function cannot be changed
C) the function cannot change the data members
D) the function’s arguments cannot be changed

29. To pass an object of class `person` to a function as a formal value parameter most efficiently you should use:

A) `person p`
B) `const person p`
C) `person &p`
D) `const person &p`

30. If a pointer `p` points to a struct type variable of type `car` which has fields `make`, `model` and `year`, which of the following is a correct way to reference the model.
    A) `p.car.model`
    B) `*p.model`
    C) `p.model`
    D) `(*p).model`

31. Given the class definition:
```
class CreateDestroy
{
public:
   CreateDestroy() { cout << "constructor called, "; }
   ~CreateDestroy() { cout << "destructor called, "; }
};
```
What will the following program output?
```
int main()
{
   CreateDestroy c1;
   CreateDestroy c2;
   return 0;
}
```
    A) constructor called, destructor called, constructor called, destructor called,
    B) constructor called, destructor called,
    C) constructor called, constructor called,
    D) constructor called, constructor called, destructor called, destructor called,

32. Given the following declarations:
```
struct house
{
     double price;
     int rooms;
};
house *ptr1, *ptr2;
```
    which of the following is an *invalid* use of ptr1 and/or ptr2?
    A) `ptr1->price = 200000;`
    B) `(*ptr1).rooms = ptr2->rooms;`
    C) `ptr2.rooms = 3;`
    D) `ptr1 = ptr2;`

33. What is true about the following statement?
```
out.open("values.dat", ios::app);
```
    A) If the file already exists, its contents are preserved and all output is written to the end of the file.
    B) If the file exists, it should be replaced with a new copy of values.dat.
    C) If the file exists, it can be opened but not modified.
    D) None of these

34. A header file is typically given the filename extension:
    A) .h
    B) .hdr
    C) .header
    D) .cpp

35. This is a special function that is called whenever a new object is created and initialized with another object's data.
    A) destructor
    B) static function
    C) copy constructor
    D) assignment function
    E) None of these

36. The assignment operator (=) *can* be used to:
    A) Test for equality.
    B) Copy data from one object to another.
    C) Compare two objects.
    D) Copy a class' member functions.

37. The compiler will implicitly create a default constructor if:
    A) The class does not contain any data members.
    B) The programmer specifically requests that the compiler do so.
    C) The class does not define any constructors.
    D) The class already defines a default constructor.

38. Which of the following statements is *not* true of a constructor and destructor of the same class?
    A) They both have the same name aside from the tilde (~) character.
    B) They are both usually called once per object created.
    C) They both are able to have default arguments.
    D) Both are called automatically, even if they are not explicitly defined in the class.

Extra Credit (2 pts):

39. If Americans are objects of the same class, which of the following attributes would most likely be represented by a static variable of that class?
    A) Age.
    B) The President.
    C) Place of birth.
    D) Favorite food.

40. When independent software vendors provide class libraries to clients, they typically give the _____ for the class's interface and the _____ for the class's implementation.
    A) Source code file, source code file.
    B) Source code file, object file.
    C) Object file, source code file.
    D) Object file, object file.

41. Inside a function definition for a member function of an object with data element `x`, which of the following is *not* equivalent to `this->x`:
    A) `*this.x`
    B) `(*this).x`
    C) `x`
    D) `(* (& (*this) ) ).x`

42. True(A)/False(B)
Look at the following structure declaration.

```
struct Circle
{
    double centerX;
    double centerY;
    double radius;
};
```

Assume that `circle1` and `circle2` are variables of the `Circle` type, and their members have been initialized.

The following if statement correctly determines whether the two variables' members contain the same data:

```
if (circle1 == circle2)
```

43. What is the output of the following program?

```
#include <iostream>
using namespace std;

class TestClass
{
private:
    int val;
    void showVal()
    { cout << val << endl; }

public:
    TestClass(int x)
    { val = x; }
};

int main()
{
    TestClass test(77);
    test.showVal();
    return 0;
}
```

A) The program runs, but with no output.
B) 77
C) 0
D) The program will not compile.