

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) ostream
 - 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.