Computing III: Packet 3

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) A member function that gets called automatically when an object of the class is declared is called a _____. 1) _____

2) What can a constructor return? 2) _____

3) The name of a constructor is _____. 3) _____

4) The constructor of a class that does not have any parameters is called a _____ constructor. 4) _____

5) In the following class constructor definition, the part of the header starting with a single colon is called the _____. 5) _____

```
BankAccount::BankAccount( ): balance(0), interest(0.0)
```

6) If a given task being performed by a function involves more than one object, then that function should normally be a _____ function. 6) _____

7) An overloaded extraction or insertion operator should return _____. 7) _____

8) A _____ function is not a member of the class, but has access to the private members of the class. 8) _____

9) A friend function needs to be passed an object of the class. If the friend only needs to access the object, but not change its data members, then the object should be passed as _____. 9) _____

10) Putting the keyword const after the function declaration guarantees _____. 10) _____

11) Putting the keyword const in front of a pass by reference parameter guarantees _____. 11) _____

12) Write the function declaration for a destructor for a class named myClass. 12) _____

13) Write the function declaration for a copy constructor for a class named myClass. 13) _____

14) Both the copy constructor and the assignment operator should make _____. 14) _____

15) The assignment operator must be a _____ of the class. 15) _____

16) The _____ class lets you treat string values and variables like other pre-defined data types (such as int). 16) _____

17) How do you concatenate two string values (str1, str2)? 17) _____

18) What is the code to print out the third character in a string variable named str? 18) _____

19) Which string function returns the first occurrence of str1 in a string named str? 19) _____

20) _____ can be thought of as an array that can grow and shrink as needed. 20) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

21) A class member function that automatically initializes the data members of a class is called 21) _____
A) a cast. B) the init function.
C) an operator. D) a constructor.

22) If you have a class named myPersonClass, which of the following correctly declare a constructor in the class definition? 22) _____
A) myPersonClass( ); B) cast( );
C) myPersonClass::myPersonClass( ); D) init( );

23) Given the following class definition, what is missing? 23) _____

```
class ItemClass
{
public:
    ItemClass(int newSize, float newCost);
    int getSize( );
    float getCost( );
    void setSize(int newSize);
    void setCost(float newCost);
private:
    int size;
    float cost;
};
```

A) nothing B) a default constructor
C) mutator functions D) accessor functions

24) Given the following class definition, how could you use the constructor to assign values to an object class? 24) _____

```
class CDAccount
{
public:
      CDAccount( );
      CDAccount(float interest, float newBalance);
      float getBalance( );
      float getRate( );
      void setRate(float interest);
      void setBalance(float newBalance);
private:
      float balance, rate;
};
```

and the following object declaration
CDAccount myAccount;

A) myAccount = CDAccount[myRate, myBalance];
B) myAccount = CDAccount(myRate, myBalance);
C) myAccount = CDAccount {myRate, myBalance};
D) myAccount = CDAccount(float myRate, float myBalance);

25) Given the following class definition, how would you declare an object of the class, so that the object automatically called the default constructor? 25) _____

```
class ItemClass
{
public:
      ItemClass( );
      ItemClass(int newSize, float newCost);
      int getSize( );
      float getCost( );
      void setSize(int newSize);
      void setCost(float newCost);
private:
      int size;
      float cost;
};
```

A) ItemClass myItem(1, 0.0);
B) ItemClass( ) myItem;
C) ItemClass myItem;
D) ItemClass myItem( );
E) You cannot do this.

26) Given the following class, what would be the best declaration for a constructor that would allow the user to initialize the object with an initial age and cost? 26) _____

```
class Wine
{
public:
    Wine( );
    int getAge( );
    float getCost( );
private:
    int age;
    float cost;
};
```

A) Wine( );
B) int getAge(int newAge);
C) Wine(int newAge, float newCost);
D) Wine(int age);

27) Operators can be overloaded as 27) _____

A) members of a class.
B) non-friends, non-members of a class.
C) friends of a class.
D) all of the above

28) If we have a full selection of accessor and mutator functions, why would we have friend functions? 28) _____

A) The friend function must call the accessor or mutator functions anyway.
B) more efficient access to the private data members
C) You should not have them.
D) none of the above

29) Since accessor functions in a class do not modify or mutate the data members of the object, the function should have the _____ modifier. 29) _____

A) friend B) private C) reference D) const

30) How many members (data and functions) does the following class have? 30) _____

```
class Rational
{
public:
    Rational( );
    Rational(int numer, int denom);
    Rational(int whole);

    int getNumerator( );
    int getDenominator( );

    friend void display(ostream& out, const Rational& value);
private:
    int numerator;
    int denominator;
};
```

A) 6 B) 5 C) 2 D) 8 E) 7

31) Why should you generally pass an object of the class to a friend function as a reference parameter? 31) _____
A) It is more efficient to pass the object by reference.
B) if the friend function will not change the values of the data member(s)
C) if the friend function changes the values of the data member(s)
D) A and B
E) A and C

32) Given the following class, what is syntactically wrong with the implementation of the display function? 32) _____

```
class Rational
{
public:
    Rational( );
    Rational(int numer, int denom);
    Rational(int whole);

    int getNumerator( );
    int getDenominator( );

    friend void display(ostream& out, const Rational& value);
private:
    int numerator;
    int denominator;
};

void display(ostream& out, const Rational& value)
{
    out << value.getNumerator( ) << '/'<< value.getDenominator( );
}
```

A) nothing
B) out should be pass by value.
C) The get functions are not const functions.
D) value must not be pass by reference.

33) To overload functions with symbolic names (like + - / <<), you must use the keyword _____ before the symbolic name. 33) _____
A) reference B) void C) const D) operator

34) In the following code fragment, which is the calling object for the less-than operator? 34) _____

```
string s1, s2;
if( s1 < s2 )
```

A) < B) s2 C) s1 D) none

35) Given the following class declaration, 35) _____

```
class Rational
{
public:
    Rational( );
    Rational(int numer, int denom);

    int getNumerator( ) const;
    int getDenominator( ) const;

    friend void display(ostream& out, const Rational& value);

    friend bool operator(const Rational& left, const Rational& right);
private:
    int numerator;
    int denominator;
};
```

what must we add to the class in order for the following code to compile?

```
Rational myRational(2,3);
if ( 3 < myRational)
```

A) We need a constructor that expects a ration number
B) We need another < operator that expects an integer as the first parameter.
C) We need another < operator that expects an integer as the second parameter.
D) We need a constructor that expects an integer
E) B or D

36) When overloading an operator, which of the following is true? 36) _____

A) The operator does not have to be a friend or a member of the class.
B) One of the arguments must be an object of the class.
C) The operator can be a friend or a member of the class.
D) all of the above
E) none of the above

37) What is wrong with the following overloaded extraction operator declaration? 37) _____

```
istream& operator >> (istream& in, const myClass &object);
```

A) Object should not be a pass by reference parameter.
B) You cannot put the & on the return type.
C) Object should not be a const parameter.
D) nothing

38) How many parameters are there in a binary operator implemented as a friend? 38) _____

A) 2 B) 0
C) 1 D) as many as you need

39) How many parameters are there in a binary operator implemented as a member function? 39) _____

A) 1 B) 0
C) 2 D) as many as you need

40) Which of the following would be an appropriate function declaration to add two rational numbers if the declaration is not made within a class? 40) _____

A) Rational operator+(const Rational &left, const Rational &right);
B) friend Rational operator+(const Rational &left, const Rational &right);
C) void operatator+(const Rational &left, const Rational &right);
D) void friend operator+(const Rational &left, const Rational &right);

41) Given the following function declaration, 41) _____

```
friend void display(const myClass& object);
```

which is the correct header for the definition of the function?

A) friend void display(const myClass& object)
B) friend void display(const myClass& object);
C) void display(const myClass& object)
D) void myClass::display(const myClass& object)

42) Why are the extraction and insertion operators always implemented as friends of the class rather than as members of the class? 42) _____

A) because they return a reference
B) because the stream is passed by reference
C) because the first parameter must be the stream object
D) They don't, they could be members.

43) If you want to be able to compile the following code, 43) _____

```
Rational r1;
int x;
cout << r1 + x << endl;
```

which overloaded operator(s) do you need?

A) friend Rational operator+(const Rational& left, int right);
B) friend void operator+ (const Rational& left, int right);
C) friend ostream operator << (ostream& out, const Rational& object);
D) friend ostream& operator << (ostream& out, const Rational& object);
E) A and D

44) What member functions do you need to allow the compiler to perform automatic type conversions from a type different than the class to the class? 44) _____

A) This cannot be done. B) converters
C) This already happens automatically. D) overloaded constructors

45) In an overloaded insertion or extraction operator, which object should be the first parameter, the stream or the object of the class? 45) _____

A) the object B) It doesn't matter.
C) the stream D) none of the above

46) Which of the following operators cannot be overloaded? 46) _____

A) . B) == C) [ ] D) =

47) The destructor for a class is called 47) _____
A) explicitly from the main program.
B) when the class is instantiated.
C) only at the end of main.
D) when the object of the class goes out of scope.

48) The copy constructor for a class is called 48) _____
A) when an object of the class is initialized by another object of the class.
B) when a function returns an object of the class.
C) when an object of the class is passed by value to a function.
D) all of the above

49) What happens when you define a class that used dynamic memory allocation and define a destructor but no copy constructor? 49) _____
A) When an object that was used as an argument for a call-by-value parameter goes out of scope, it will cause a run-time error.
B) If an object of the class is plugged in for a call-by-value parameter, when the function ends, the parameter's dynamic memory is returned to the freestore at the end of the function execution.
C) It is possible to modify the values in the argument in the function.
D) all of the above
E) none of the above

50) If obj1 and obj2 are both objects of a class that uses dynamic memory allocation, but the class does n 50) _____
have an assignment operator, what happens if you execute the following code?

obj1 = obj2;

A) A syntax error occurs, you cannot assign one object to another object without the = operator.
B) There is a complete and independent copy of all the dynamic memory from obj2 to obj1.
C) The pointer(s) to the dynamically declared memory in obj2 are copied to the corresponding pointers in obj1.
D) A run-time error occurs, because the C++ system does not know how to do the assignment.

51) What is the value of str after the following code? 51) _____
string str;
A) the null character B) the empty string
C) a garbage string D) unknown

52) Which is the proper way to determine how many characters are in the string variable named str? 52) _____
A) length(str) B) str.getLength( ) C) str.length( ) D) getLength(str)

53) If the name of a file to open is in the string variable name fileName, which of the following will correctly open the file for output? 53) _____
A) out_file.open(fileName); B) out_file.open("fileName");
C) out_file.open(fileName.c_str( )); D) fileName.open(outfile);

54) Which of the following would correctly read an entire line from an input file stream named fin into a string variable named line? 54) _____
A) fin.getline(line,'\n\'); B) getline(fin, line);
C) fin.getline(line); D) fin.getline(line,80);

55) The notation vector < Base_Type > means that the vector is 55) _____
A) primitive data type. B) an array.
C) a template class. D) all of the above

56) The base type for a vector can be 56) _____
A) float or double. B) char. C) int. D) any data type.

57) What is the proper way to declare a vector of strings named names? 57) _____
A) vector strings names; B) vector < string > names;
C) vector < names > string; D) all of the above

58) To add an element to a vector of integers named numbers at the next available position in the vector, you would use _____. 58) _____
A) numbers = newValue; B) numbers[numbers.size( )+1] = newValue;
C) numbers.push_back(newValue); D) numbers.pushBack(newValue);

59) What is the value of numbers.size( ) after the following code? 59) _____

```
vector < float > numbers;
```

A) 0 B) 100 C) 10 D) unknown

60) What is the value of numbers.size( ) after the following code? 60) _____

```
vector < float > numbers(100);
```

A) 10 B) 100 C) 0 D) unknown

61) What is the value of numbers.size( ) after the following code? 61) _____

```
vector < float > numbers;
numbers.reserve(100)
```

A) 0 B) 100 C) 10 D) unknown

62) What is the value of numbers.capacity( ) after the following code? 62) _____

```
vector < float > numbers;
numbers.reserve(100)
```

A) 100 B) 0 C) 10 D) unknown

63) When a vector is assigned to another vector 63) _____
A) only the location of the vector is copied.
B) if there is not enough room in the left-hand vector, then not all the values from the right side are copied.
C) all the values in the vector are copied.
D) none of the above

64) If a vector named numbers has 20 elements in it, what is the result of executing the following statement? 64) _____
numbers.resize(10);

A) no change
B) The last 10 elements are removed.
C) This causes a run-time error.
D) The first 10 elements are removed.

65) Given the following code, what is the correct statement to insert the string str2 into str1, directly after the 'd'? 65) _____
string str1 = "abcdefg";
string str2 = "ABCDE";

A) str2.insert(4,str1);
B) str1.insert(4,str2);
C) insert(str1,4) = str2;
D) insert(str2,4) = str1;

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

66) All constructors for a class must be private. 66) _____

67) Friend functions are members of the class. 67) _____

68) All operators can be overloaded. 68) _____

69) If you have mutators and accessors, you should not have friend functions also. 69) _____

70) Friend functions may directly modify or access the private data members. 70) _____

71) Functions that are constant member functions may call the class mutator functions. 71) _____

72) Functions that are constant member functions may call constant class accessor functions. 72) _____

73) You cannot create new operators (such as the quote). 73) _____

74) You may not change the precedence of operators by overloading them. 74) _____

75) Operators must be friends of the class. 75) _____

76) The following code declares a vector of characters. 76) _____
vector characters < char >

77) The following code declares a vector of integers named numbers that reserves space for 100 integers 77) _____
vector < int > numbers(100);

78) Vectors can have any type as the base type. 78) _____

79) Using the == operator on a string variable results in the same value as using strcmp on two c-strings. 79) _____

80) Using the [i] on a string variable does not check for illegal values of i. 80) _____