Study Guide for Midterm 1 – CMPE 50 Spring 2013

Practice from Textbook 'Problem Solving with C++', W. Savitch

Chapter 4 Procedural Abstraction and Functions That Return a Value
Reading from textbook:
Ch. 4
Self-study exercises
Slides

Practice:
TRUE FALSE

1. the parameter names are mandatory in the function header
   ANSWER: False
2. it is possible to have a function that has no parameters
   ANSWER: TRUE
3. variables that are declared outside of any function body or parameter list are considered global.
   ANSWER: TRUE
4. pow(2,3) is the same as pow(3,2).
   ANSWER: False
5. Functions may have multiple return statements.
   ANSWER: TRUE

Fill In the Blank

1. In the following function declaration, the variable size is known as a _____.
   int myFunction (int size);
   ANSWER: (formal) parameter
2. The _____ describes how the function will work.
   ANSWER: function body
3. When you want to use a function in your program, you would make a function _____.
   ANSWER: call or invocation
4. The black box analogy demonstrates the concept of _____.
   ANSWER: information hiding or procedural abstraction
5. A problem-solving approach that starts with the big problem and breaks it down into smaller pieces is called _____.
   ANSWER: top-down approach
6. Algorithms are typically described in _____.
   ANSWER: psuedocode
7. Varibles that are declared inside a function are said to be _____ to that function.
   ANSWER: local
8. The _____ of a variable is where that variable can be used.
   ANSWER: scope
9. Constant variables that might be used in different functions should be _____
   ANSWER: global

Multiple Choice

1. What is the value of x after the following code fragment executes?
   float x = 36.0;
   x = sqrt(x);
   a. 36.0
   b. 6.0
   c. 3.0
   d. 2.456

ANSWER: B

2. using namespace std; tells the compiler
   a. where to get the definitions of certain objects (variables)
   b. where your program is located
   c. what language to use for input and output
   d. nothing

ANSWER: A

3. the fabs(double num) function
   a. returns the most fabulous number
   b. returns the largest whole number <= num
   c. returns the negative value of num
   d. returns the absolute value of num

ANSWER: D

4. If you need to write a function that will compute the cost of some candy, where each piece costs 25 cents, which would be an appropriate function declaration?
   a. int calculateCost(char name);
   b. char calculateCost(int count);
   c. int calculateCost int count;
   d. int calculateCost(int count);

   ANSWER: D

5. When overloading a function, what must be true?
   a. The names should be different with the same number and/or types of parameters.
   b. The names should be the same with different number and/or types of parameters.
   c. The names should be different with different number and/or types of parameters.
   d. The names should be the same with the same number and/or types of parameters.

   ANSWER: B

6. Which of the following are valid function calls to the fabs function?
   a. fabs(3.5);
   b. cout << fabs(3.5);
   c. cin >> fabs(3.5);
   d. fabs(cin >> x);
   e. a,b and c
   f. a and b

   ANSWER: F

7. In the function declaration shown, the mechanism used to call this function is known as:
   double pow(double base, double exp);
   a. pass by name
   b. pass by value
   c. pass by name
   d. call by name

   ANSWER: B

8. What is the value of i after the following function call?

```
//function definition
int doSomething(int value)
{
        value = 35;
        return value;
        value = 13
}

//fragment of main program
int i=0;
cout << doSomething(i);
```

a. 13
b. 35
c. 48
d. 0

ANSWER: D

9. When the function below is called, the _____ of the actual parameters is passed to the function definition.

```
double sqrt(double value);
```

a. name
b. value
c. address
d. scope

ANSWER: B

Chapter 5 Procedural Abstraction and Functions That Return a Value

Reading from textbook:

Ch. 5
Self-study exercises
Slides

Practice:

TRUE/FALSE

1. A void function can return any value

ANSWER: FALSE

2. A void function can be used in an assignment.

ANSWER: FALSE

3. Functions can return at most one value.

ANSWER: TRUE

4. The following is legal in a void function
   return;

ANSWER: TRUE

5. In a function with call-by-reference parameters, the values of the actual arguments are passed to the function.

ANSWER: FALSE, The actual variables (or more precisely their memory addresses) are passed.

6. In a function with call-by-reference parameters, any changes to the formal parameters will change the actual arguments passed to the function.

ANSWER: TRUE

7. It is acceptable to have both call-by-value and call-by-reference parameters in the same function declaration.

ANSWER: True

SHORT ANSWER

1. A _____ is a main program that only checks that functions execute correctly.

ANSWER: driver

2. The values or variables listed in the function declaration are called _____ to the function.

ANSWER: (formal) parameters

3. If we want to test if a given function works correctly, we would write a _____ to test it.

ANSWER: driver

4. The variables passed a function are called _____.

ANSWER: arguments

5. What is the correct way to call the following function? _____
   void setDisplay();

ANSWER: setDisplay();

6. What symbol is used to signify that a parameter is a reference parameter? _____

ANSWER: ampersand (&)

MULTIPLE CHOICE

1. Which of the following is a legal call to the displayOutput function?
   void displayOutput(int total);
   a. void displayOutput(myTotal);

b. displayOutput(int mytotal);
c. displayOutput(myTotal);
d. cout << displayOutput(myTotal);

ANSWER: C

2. The precondition(s) for a function describe:
   a. What is true after the function is executed
   b. What the function does
   c. How to call the function
   d. What must be true before the function executes

   ANSWER: D
3. Which of the following is true for a void function?
   a. There cannot be a return statement.
   b. The value of void should be returned.
   c. The value of 0 should be returned.
   d. Nothing is returned.

   ANSWER: D

4. Call-by-reference parameters are passed
   a. nothing
   b. the actual argument.
   c. the value in the actual argument.
   d. the address of the argument.

   ANSWER: B
5. What is the output of the following function and function call?

```
void calculateCost(int count, float& subTotal, float taxCost);

float tax = 0.0, subtotal = 0.0;

calculateCost(15, subtotal, tax);
cout << "The cost for 15 items is " << subtotal
     << ", and the tax for " << subtotal << " is " << tax << endl;
//end of fragment

void calculateCost(int count, float& subTotal, float taxCost)
{
    if ( count < 10)
    {
            subTotal = count * 0.50;
    }
    else
    {
            subTotal = count * 0.20;
    }
    taxCost = 0.1 * subTotal;
}
```

   a. The cost for 15 items is 3.00, and the tax for 3.00 is 0.30;
   b. The cost for 15 items is 0.00, and the tax for 3.00 is 0.00;
   c. The cost for 15 items is 0.00, and the tax for 3.00 is 0.30;

d. The cost for 15 items is 3.00, and the tax for 3.00 is 0.00;
ANSWER: D

6. You should make a parameter a reference parameter if:
   a. You need the function to change the value of the argument passed to the function.
   b. You need to be able to change the value of the parameter in the function, but not the value of the argument.
   c. Always.
   d. If any of the other parameters are reference parameters.
   ANSWER: A
7. What is the value of choice after the following statements?
   void getChoice(int& par_choice, in par_count);
   int choice, count=3;

   getChoice(choice, count);

   void getChoice(int& par_choice, in par_count)
   {
   ```
   if(par_count<0)
       par_choice =0;
   if(par_count = 0)
       par_choice=-1;
   else
       par_choice=99;
   return;
   ```
   }
   a. 3
   b. 0
   c. –1
   d. 99
   ANSWER: D
8. Given the function definition

   void something (int a, int& b)
   {
   int c;
   c = a + 2;
   a = a * 3;
   b = c + a;
   }
   what is the output of the following code fragment that invokes something?
   (All variables are of type int.)
   r = 1;
   s = 2;
   t = 3;
   something(t, s);
   cout << r << ' ' << s << ' ' << t << endl;
   a. 1 14 3
   b. 1 10 3

c. 5 14 3
d. 1 14 9
e. none of the above
ANSWER: A

9. Given the following function definition

```
void shift(int& a, int&b)
{
        a=b;
        b=a;
}
```

What is the output after the following function call?

```
int first=0, second=10;
shift(first, second);
cout << first <<" "<< second << endl;
```

a. 0 10
b. 10 0
c. 0 0
d. 10 10
ANSWER: D

10. If a function needs to modify more than one variable, it must
a. be pass by value
b. be a void function
c. return all values needed
d. be a call by reference function
ANSWER: D

11. Call-by-reference should be used
a. For all variables
b. When the function needs to change the value of one or more arguments
c. Never
d. only in void functions
ANSWER: B

12. What is wrong with the following code?

```
int f1( int x, int y)
{
        x = y * y;
        return x;

        int f2( float a, float& b)
        {
                if(a < b)
                        b = a;
                else
                        a=b;
                return 0.0;
        }
}
```

a. Neither function should return a value

b. Function definitions may not be nested
c. Both parameters to f2 should be pass-by reference
d. in f2, a can not be assigned b.
e. nothing is wrong

ANSWER: B

Chapter 6 I/O Streams as an Introduction to Objects and Classes

Reading from textbook:

Ch. 6.1 – 6.3
Self-study exercises
Slides

TRUE/FALSE

1. Two different objects of the same class have a different set of member functions.
   ANSWER: FALSE
2. You may not have more than one input and one output stream open at any one time.
   ANSWER: FALSE
3. The formatting options that were discussed for cout do not work for output file streams.
   ANSWER: FALSE
4. You must use a width statement before each variable that you want output in a certain width
   ANSWER: TRUE
5. If you use the width command, it stays in effect for all values that are send to the stream.
   ANSWER: FALSE
6. Streams may be passed to a function.
   ANSWER: TRUE
7. You may use a read (extraction) as a boolean expression in an if or while statement.
   ANSWER: TRUE
8. Using directives can be placed either directly after the include directives, or at the beginning of each function definition.
   ANSWER: TRUE
9. '\n' is two characters.
   ANSWER: FALSE
10. Data that is sent to an output stream representing a file will be immediately saved to disk.
    ANSWER: FALSE

Short Answer

1. A _____ is a flow of characters or other data.
   ANSWER: stream
2. open is a _____ function of the ofstream and ifstream class.
   ANSWER: member
3. A type whose variables are objects is known as a _____.
   ANSWER: class
4. The flag to display floating point numbers in non-scientific notation is ios:: _____
   ANSWER: fixed
5. The flag to always show the decimal point in floating numbers is ios:: _____
   ANSWER: showpoint
6. A value that can be turned on or off is called a _____.
   ANSWER: flag
7. The manipulator used to change the number of decimal places displayed is _____
   ANSWER: setprecision
8. When passing a stream to a function, it must always be pass-by-_____.
   ANSWER: reference
9. All data is input and output as _____ data.
   ANSWER: character

10. Which command reads one character even if that character is a blank space? _____
    ANSWER: get
11. "\n" is a _____ and '\n' is a _____.
    ANSWER: string, character
12. The _____ function puts one character back into the input stream.
    ANSWER: putback
13. The member function eof() is (true/false) when we are ready to read the end of file character.
    ANSWER: false
14. In the following function declaration, the istream object cin is called a _____.
    void output(istream& in=cin);
    ANSWER: default argument

Multiple Choice

1. Which of the following is not used when using files for input and output
    A. Opening the file stream
    B. Ensuring that the stream opened
    C. Closing the stream
    D. Prompting for file data

    ANSWER: D
2. Which include directive is necessary for file IO
    A. #include <fstream>
    B. #include <iomanip>
    C. #include <cstdlib>
    D. #include <fileIO>

    ANSWER: A
3. When is the external name of the file used in the program?
    A. Any time you read or write to the file
    B. Never
    C. Only when reading from the file
    D. When opening the file stream

    ANSWER: D
4. A(n) _____ is a variable that has functions as well as data associated with it.
    A. member
    B. int
    C. object
    D. float

    ANSWER: C
5. A function that is associated with an object is called a _____ function.
    A. input
    B. output
    C. member
    D. instantiated

    ANSWER: C
6. Which of the following is the correct way to close a file stream named outFile?
    A. outFile.close();
    B. outFile.close;
    C. outFile.close("project.txt");
    D. close(outFile);

    ANSWER: A

7. After a stream is opened, before it is used for input and output, it should be
    A. declared
    B. closed
    C. checked to see if it opened correctly
    D. none of the above

   ANSWER: C
8. If a file did not open correctly, you should
    A. continue on anyway
    B. display an error message and continue on
    C. display an error message and take some suitable action such as exit
    D. exit the program immediately

   ANSWER: C
9. In order to read data from a file you
    A. must know the kind of data in the file
    B. do not need to know the kind of data in the file
    C. should prompt the user for the data you are looking for
    D. a and c

   ANSWER: A
10. To open an output file and add to the end of the data already in the file you would write
    A. outFile.open("project.txt");
    B. outFile.append("project.txt");
    C. outFile.open("project.txt", append);
    D. outFile.open("project.txt", ios::app);

   ANSWER: D
11. To open a file with a user supplied name, you would need to store the name in a variable. If the file name was to have no more than 20 characters in it, which would be an appropriate declaration of the file name variable?
    A. char filename;
    B. char filename(20);
    C. char filename[20];
    D. char filename[21];

   ANSWER: D
12. If the name of the input file was in a variable named filename, which of the following is the correct way to open the input stream named inFile and associate it with this file?
    A. inFile.open(filename);
    B. inFile=filename;
    C. inFile="filename";
    D. inFile.open("filename");

   ANSWER: A
13. The member function setf stands for
    A. set the file name
    B. set the flags
    C. set the format
    D. nothing

   ANSWER: B
14. The command outFile.precision(2);
    A. truncates all floating point variables to 2 decimal places
    B. sets all output streams in your program to display 2 secimal places

C. displays integers as floating point numbers.
D. displays all floating point values sent to outFile with 2 decimal places.

ANSWER: D

15. ios::showpos is a flag that
    A. always displays a + in front of positive integers
    B. can be used to find the absolute value of an integer
    C. always displays a + in front of all integers
    D. all of the above

    ANSWER: A
16. The command outFile.width(10) is used to
    A. change the number of characters in the output
    B. sets the filename of outFile to 10 characters
    C. always uses 10 characters to display the output
    D. displays the next value in at least 10 characters

    ANSWER: D
17. In order to use the stream manipulators, you must include the _____ library
    A. manip
    B. iomanip
    C. cstdlib
    D. fstream

    ANSWER: B
18. If the user types in the characters 10, and your program reads them into an integer variable, what is the value stored into that integer?
    A. 1
    B. 0
    C. 10
    D. none of the above.

    ANSWER: C
19. The get function reads
    A. one integer value
    B. one float value
    C. one double value
    D. one character value

    ANSWER: D
20. The put function outputs
    A. one character value
    B. one float value
    C. one integer value
    D. one double value

    ANSWER: A
21. We have a file that has a name in it, but the name is written one character per line. We need to write this name to the screen. What is wrong with the following code?

```
ifstream fileIn;
fileIn.open("file.txt");
char ch;
fileIn.get(ch)
while(!fileIn.eof())
```

```
{
        cout.put(ch);
        fileIn.get(ch);
}
```

A. can not use put with cout.
B. our output has new lines in it.
C. nothing is wrong
D. eof is not a member of an ifstream object

ANSWER: B

22. What is wrong with the following code?

```
while( ! fileIn.eof() )
{
        fileIn >> value;
        fileOut << value;
}
```

A. We have read past the end of the input file and attempt to output a nonexistent value
B. We have written past the end of the output file
C. Nothing
D. A and B

ANSWER: A

23. What is the output of the following code?

```
char ch='G';
cout << tolower(ch) << endl;
```

A. G
B. g
C. the integer value of 'g'
D. the integer value of 'G'

ANSWER: C

24. Which function returns true if the character argument is a letter?

A. isdigit
B. islower
C. isalpha
D. isspace

ANSWER: C

Chapter 7 Arrays
Reading from textbook:
Ch. 7.1 – 7.4
Self-study exercises
Slides

Practice:

TRUE/FALSE

1. The indexed variables (members) of an array must be integers.
   ANSWER: FALSE
2. The locations of the various indexed variables in an array can be spread out all over the memory.
   ANSWER: FALSE
3. The following array declaration is legal
   double scores[ ]={0.1,0.2,0.3};
   ANSWER: true
4. Arrays can be passed to functions.
   ANSWER: TRUE
5. If a function is expecting a pass by reference parameter, you can pass an index variable from an array of the same base type to that function.
   ANSWER: TRUE
6. When you have a function that expects an array, it should also expect the size of the array or the number of indexed variables with valid data.
   ANSWER: TRUE
7. The following function declaration guarantees the values in the array argument are not changed.

   void function1(int array[], int numElements);

   ANSWER: FALSE
8. If you use the const modifier in a function declaration, you do not include it in the function definition.
   ANSWER: FALSE

Short Answer

1. Write the code to declare an array of 10 doubles named list;
   ANSWER: double list[10];
2. The modifier that guarantees that an array argument will not be changed is called _____.
   ANSWER: const
3. How many indexed variables does the following array have?
   int myArray[]={1,2,3,6,5,4,7,1,2};
   ANSWER: 9
4. Write the declaration for a function named funct1 that expects an array of floats, the number of elements in the array and does not return any value.
   ANSWER: void funct1(float myArray[], int numElements);
5. If your index used to access the indexed variables of the array has the value of a non-existent index, this is called _____

ANSWER: Index out of range, Index out of bounds, or illegal.

6. The computer remembers the address of which indexed variable(s) in an array? _____
   ANSWER: the first
7. A computer's memory consists of numbered locations called _____.
   ANSWER: bytes
8. In the expression
   double score[10];
   double is called the _____ of the array
   ANSWER: base type
9. An _____ is used to process a collection of data all of which is the same type
   ANSWER: array
10. The individual variables that comprise an array are called _____
    ANSWER: indexed variables, subscripted variables, or elements.
11. Indexes are numbered starting at _____
    ANSWER: 0

Multiple Choice

1. What are the valid indexes for the array shown below?
   int myArray[25];
   A. 0-25
   B. 0-24
   C. 1-25
   D. 1-24
   ANSWER: B
2. Given an array named scores with 25 elements, what is the correct way to access the 25th element?
   A. scores+25
   B. scores[24]
   C. scores[25]
   D. scores[last]
   ANSWER: B
3. Given an array of integers of size 5, how does the computer know where the 3rd indexed variable is located?
   A. It adds 3 to the base address of the array
   B. It adds space for 3 integers to the base address of the array
   C. It remembers where all the indexed variables of the array are located.
   D. None of the above
   ANSWER: B

4. What is wrong with the following code fragment?

```
const int SIZE =5;
float scores[SIZE];
for(int i=0; i<=SIZE;i++)
{
        cout << "Enter a score\n";
        cin >> scores[i];
}
```

   a. Array indexes start at 1 not 0

b. Arrays must be integers
c. Array indexes must be less than the size of the array
d. Should be cin >> scores[0];

ANSWER: C

5. Which of the following declare an array of 5 characters, and initializes them to some known values?
   A. char array[5]={'a','b','c','d','e'};
   B. char array[4]={'a','b','c','d','e'};
   C. char array[5]={''};
   D. char array[]={'a','b','d','e'};
   E. A and C
   F. B and D
   G. all of the above

   ANSWER: E
6. Arrays are always passed to a function using
   A. pass by value
   B. pass by reference
   C. pass by array
   D. you cannot pass arrays to a function

   ANSWER: C

7. Given the following declarations, which of the following is a legal call to this function?
   int myFunction(int myValue);

   int myArray[1000];
   A. cout << myFunction(myArray);
   B. cout << myFunction(myArray[0]);
   C. myArray = myFunction(myArray);
   D. myArray[1] = myFunction(myArray[0]);
   E. A and B
   F. A and C
   G. B and D

   ANSWER: G
8. Which of the following function declarations correctly guarantee that the function will not change any values in the array argument?
   A. void f1(int array[], int size) const;
   B. void f1(int array[], int size);
   C. void f1(int &array, int size);
   D. void f1(const int array[], int size);
   E. void f1(int array[], const int size);

   ANSWER: D
9. Which of the following function declarations could be used to input data from the keyboard into the array?
   A. void input(int array[], int &numElements, int MAX_SIZE);
   B. void input(int array[], int numElements, int MAX_SIZE);
   C. void input(int &array[], int numElements, int MAX_SIZE);
   D. int array[] input(int array[], int &numElements, int MAX_SIZE);

   ANSWER: A

10. Given the following function definition for a search function, and the following variable declarations, which of the following are appropriate function calls?

```
const int SIZE=1000;
int search(const int array[], int target, int numElements);

int array[SIZE], target, numberOfElements;
```

    A. search(array[0], target, numberOfElements);
    B. result=search(array[0], target, numberOfElements);
    C. result=search(array, target, numberOfElements);
    D. result=search(array, target, SIZE);

    ANSWER: C

11. Given the following function definition, will repeated calls to the search function for the same target find all occurrences of that target in the array?

```
int search(const int array[], int target, int numElements)
{
        int index=0;
        bool found=false;

        while((!found) && (index < numElements))
        {
                if(array[index] == target)
                        found=true;
                else
                        index++;
        }
        if(found==true)
                return index;
        else
                return -1;
}
```

    A. Yes
    B. No
    C. Impossible to tell without looking at the values of the array
    D. It depends on the value of target.

    ANSWER: B

12. Given the following function definition, what modifications need to be made to the search function so that it finds all occurrences of target in the array?

```
int search(const int array[], int target, int numElements)
{
        int index=0;
        bool found=false;

        while((!found) && (index < numElements))
        {
                if(array[index] == target)
                        found=true;
                else
```

```
                index++;
        }
        if(found==true)
                return index;
        else
                return -1;
}
```

A. Add another parameter to indicate where to stop searching
B. Add another parameter to indicate where to start searching
C. This already can find all occurrences of a given target
D. Have the function return the whole array

ANSWER: B

13. Which sort algorithm does the following outline define?
    for i between 0 and number_used-1 inclusive
        put the ith smallest element at array[i]
    A. insertion
    B. selection
    C. bubble
    D. swap

    ANSWER:B
14. If you need a function that will handle multi-dimensional arrays, you must specify the following sizes inside the square brackets.
    A. All the sizes
    B. All sizes except the last dimension
    C. All sizes except the first dimension
    D. None of the sizes

    ANSWER: C
15. Which of the following correctly declare an array that can hold up to 3 rows of 5 columns of doubles?
    A. int array[3],[5];
    B. int array[3][5];
    C. float array[3][5];
    D. float array[3,5];

    ANSWER: C

16. Which of the following will correctly assign all the values in one array to the other array? (Assume both arrays are of the same type and have SIZE elements)
    A. array1=array2;
    B. array1[]=array2;
    C. for(i=0;i<SIZE;i++)
            array1[i]=array2[i];
    D. for(i=0;i<SIZE;i++)
            array1[]=array2[];

    ANSWER: C
17. Which of the following will read values from the keyboard into the array? (Assume the size of the array is SIZE).
    A. cin >> array;
    B. cin >> array[];

C. cin >> array[SIZE];
D. for(i=0;i<SIZE;i++)
cin >> array[i];

ANSWER: D

18. Which of the following function declarations can be passed the following array?
char myArray[6][8];
A. void f1(char a[][], int sizeOfFirst);
B. void f1(char a[][8], int sizeOfFirst);
C. void f1(char& a, int sizeOfFirst);
D. void f1(char a[6][8], int sizeOfFirst);
E. B and D
F. A and D

ANSWER: E

Ch. 10 – Classes

Reading:

Ch. 10.2, 10.3
Self-study exercises
Slides

Practice:

TRUE/FALSE

1. Different class may not have member functions with the same name.
   ANSWER: FALSE
2. A class member function may be private.
   ANSWER: TRUE
3. Class data members are almost always public.
   ANSWER: FALSE
4. The assignment operator may not be used with objects of a class.
   ANSWER: FALSE
5. All constructors for a class must be private.
   ANSWER: FALSE

Short Answer

1. When several items (variables or variables and functions) are grouped together into a single package, that is known as _____.
   ANSWER: (data) encapsulation
2. The double colon (::) is known as the _____ operator.
   ANSWER: scope resolution operator
3. Who can access private members in a class?
   ANSWER: only other members of the class
4. A member function that allows the user of the class to find out the value of a private data type is called a _____.
   ANSWER: accessor function.
5. A member function that allows the user of the class to change the value of a private data type is called a _____.
   ANSWER: mutator function.
6. If you have a class with a member function called display(ostream& out), that will send the values in the class to the parameter stream, and you need to call that function from within another member function, how would you call it to print the data to the screen?
   _____
   ANSWER: display(cout);
7. What can a constructor return? _____
   ANSWER: nothing
8. The name of a constructor is _____
   ANSWER: the name of the class
9. The constructor of a class that does not have any parameters is called a _____ constructor.

ANSWER: default

10. A class in which modifications to the implementation appear to be invisible to the user of the class is known as _____.
    ANSWER: an Abstract Data Type (ADT)
11. A member function that gets called automatically when an object of the class is declared is called a _____.
    ANSWER: constructor

Multiple Choice

1. When defining a class, the class should be composed of the kind of values a variable of the class can contain, and
    a. member functions for that class
    b. the keyword private
    c. other class definitions
    d. nothing else

    ANSWER: A
2. Which of the following is the correct function definition header for the getAge function which is a member of the Person class?
    a. int getAge();
    b. int getAge()
    c. int Person:getAge()
    d. int Person::getAge()

    ANSWER: D
3. Given the following class definition and the following member function header, which is the correct way to output the private data?

```
class Person
{
public:
        void outputPerson(ostream& out);
private:
        int age;
        float weight;
        int id;
};

void Person::outputPerson(ostream& out)
{
        //what goes here?
}
```

    a. out << person.age << person.weight << person.id;
    b. out << person;
    c. out << age << weight << id;
    d. outputPerson(person);

    ANSWER: C
4. Why do you want to usually make data members private in a class?
    a. so that no one can use the class.
    b. ensure data integrity

c. provide data abstraction.
d. provide information hiding.
e. B and D
f. B, C and D

ANSWER: F

5. Given the following class definition, how could you use the constructor to assign values to an object of this class?

```
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(float myRate, float myBalance);
b. myAccount = CDAccount {myRate, myBalance};
c. myAccount = CDAccount[myRate, myBalance];
d. myAccount = CDAccount(myRate, myBalance);

ANSWER: D

6. A data type consisting of data members and operations on those members which can be used by a programmer without knowing the implementation details of the data type is called
   a. an abstract definition type
   b. an available data type
   c. an abstract data type
   d. a primitive data type

   ANSWER: C
7. If you are designing a class for an ADT, you can tell if the class is an ADT if
   a. when you change the implementation of the class, none of the rest of the program needs to change.
   b. when you change the interface of the class, nothing else needs to change.
   c. you change the private part and the rest of the program using the ADT does not compile.
   d. everything must be changed.

   ANSWER: A
8. Developing an ADT means that the user of your class does not have to know the details about how the class is implemented. This is known as
   a. interface
   b. implementation
   c. testing and debugging
   d. information hiding

ANSWER: D

9. 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?

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

   a. int getAge(int newAge);
   b. Wine();
   c. Wine(int age);
   d. Wine(int newAge, float newCost);

   ANSWER: D

10. In a class, all members are _____ by default
    a. public
    b. private
    c. global
    d. all of the above

    ANSWER: B