Review: Midterm 2

CS110B

Max Luttrell, Fall 2016

1. What is the purpose of the new operator?

2. True/False: if you use the new operator, you later should use delete. Why or why not?

3. True/False: When you add a value to a pointer using the + operator, you are actually adding that value times the size of the data type referenced by the pointer

4. You are reading a program which includes the following lines:

```
int size = 5;

int *cards = new int[size];
```

Which of the below statements is true:

a) int *cards is a function to print cards

b) If there is no delete statement anywhere else in this program, this program has a memory leak.

c) The program won't compile if there is no delete statement elsewhere in this program.

d) None of the above

6. Write a function which accepts an int array and the array size as arguments. The function should dynamically create a new array which is the same size as the array passed in. Each element in the new array should be double the corresponding element in the array passed in. Return a pointer to the new array.

E.g. if you pass in the array {2, -3, 5} of size 3, it should create a new array of size 3 with values {4, -6, 10} and return a pointer to it.

```
int *doubler(int a[], int size)
```

7. Consider the following line of code:

```
int temps[3] = {68, 72, 62};
```

- What does *temps print out?

- What does *(temps+1) print out?

- What does temps[1] print out?

8. The _____ function returns true if the character is an upper case letter of the alphabet:

a) toupper() b) isupper()

c) isalpha() d) isdigit()

e) none of these

9. The _____ function converts a C-string to an int:

a) strlen() b) length()

c) len() d) atoi()

e) none of these

10. True/False: the strcpy() function will make sure there is enough memory allocated in the destination string before copying C-strings

a) True b) False

11. True/False: when creating a string object, you must dynamically allocate enough bytes to hold the string.

a) True b) False

12. Consider the following statement, assuming goAgain is a valid char. Rewrite it using toupper() or tolower()

```
if (goAgain == 'y' || goAgain == 'Y')
```

13. Write a function which accepts a pointer to a C-string as its argument. It should return the number of words in the C-string. For example, for the C-string “Madison Bumgarner, of the Giants, pitched another gem!” your function should return 8. You may assume the parameter passed is a valid, null-terminated C-string with no newlines or tabs, and one space separates each word.

```
int wordCounter(char* str)
```

14. Assuming slogan is a valid char array storing C-String "Giants", what is the minimum size that slogan needs to be?

```
struct Resort
{
   string resortName;
   int numberLifts;
   int vertical;
   int averageSnowfall;
};
Resort r = { "Kirkwood", 15, 2000, 125 };
Resort resorts[100];
Resort *rPtr = NULL;
```

15. What value is stored in `r.averageSnowfall`?

a) 2000 b) "Kirkwood"
c) 15 d) 0
e) 125

```
struct Resort
{
   string resortName;
   int numberLifts;
   int vertical;
   int averageSnowfall;
};
Resort r = { "Kirkwood", 15, 2000, 125 };
Resort resorts[100];
Resort *rPtr = NULL;
```

16. True/False: `rPtr = &(resorts[9]);` will assign the address of the 10th element of resorts to `rPtr`

```
struct Resort
{
   string resortName;
   int numberLifts;
   int vertical;
   int averageSnowfall;
};
Resort r = { "Kirkwood", 15, 2000, 125 };
Resort resorts[100];
Resort *rPtr = NULL;
```

17. Write a function which will take a Resort structure as a parameter, and ask the user to input new values for each field of the structure. The values in the parameter must be changed to the new values and remain changed after the function call.

18. True/False: a class may have more than one destructor.

19. True/False: assume a class has a default constructor implemented. Any time an object of this class is instantiated, a constructor is called.

20. Public members of an object may be accessed using the following operator:

a) . b) >

c) - d) None of these

21. A header file (.h file) of a class typically contains:

a) The code to implement the class

b) a program using the class

c) The class declaration

d) None of the above

22. The preprocessor directive #ifndef can be used in a class header file to

a) Prevent the header file from being included multiple times

b) Declare a class namespace

c) Implement the class member functions

d) None of the above

```
class SwimmingPool
{
  private:
    int area;
    int gallons;
  public:
    SwimmingPool();
    void setArea(int);
    void setGallons(int);
    int getGallons() const
        { return gallons; }
}
```

23. Which of the following lines of code could you use to implement the setGallons function?

a) `SwimmingPool()`

b) `void SwimmingPool::setGallons(int g)`

c) `SwimmingPool::SwimmingPool()`

d) `void SwimmingPool()::setGallons(int g)`

```
class SwimmingPool
{
  private:
    int area;
    int gallons;
  public:
    SwimmingPool();
    void setArea(int);
    void setGallons(int);
    int getGallons() const
      { return gallons; }
}
```

24. True/False: function getGallons() is an inline member function
a) True b) False

25. Design a class called Date. The class should store a date in three private integers: month, day, year. There should be a member function to print out the date in the month/day/year format, e.g. 12/25/2015, 4/1/1970

There should also be a constructor which takes three parameters to initialize the date. There do not need to be any other member functions.

The constructor should not accept values for day greater than 31 or less than 1, or values for month greater than 12 or less than 1. If the constructor is called with these values an error message should be printed out and the field set to 0.

Provide the class declaration and also the implementation of the member function and constructor.