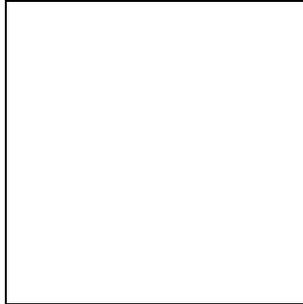


1 SI204, 25 September 2001, 6-Week Exam, X-Period

1. (5 Points) What is the output of the following program segment? (All variables are of type `int`.)

```
i = 1;
while (i <= 3)
{
    sum = 0;
    j = 1;
    while (j <= i)
    {
        sum = sum + j;
        j++;
    }
    cout << sum << ' ';
    i++;
}
```



2. (5 Points) Which of the following is an infinite loop?

(a) `for (int k=0 ; !(k==10) ; k++)`
 `cout << "Go Navy" << endl;`

(b) `int number=101;`
 `while (number<=100)`
 `{`
 `cout << "Go Navy" << endl;`
 `number--;`
 `}`

(c) `int number=101;`
 `do`
 `{`
 `cout << "Go Navy" << endl;`
 `number--;`
 `}while (number<=100);`

(d) all of the above

3. (4 Points) Which would be the proper way to write the character 7 in C++

(a) `'7'`

(b) `"7"`

(c) `7`

(d) `seven`

4. (5 Points) Consider the following loop, in which the line "....." represents a series of statements:

```
do
{
    .....
    cin >> prompt;
}while(.....);
```

If we would like the loop to stop when the user types a 'q' or 'Q' for input to the variable prompt, then which of the following boolean expressions would be appropriate for the while loop?

- (a) `(prompt == 'Q') || (prompt == 'q')`
 - (b) `(prompt != 'Q') || (prompt != 'q')`
 - (c) `(prompt == 'Q') && (prompt == 'q')`
 - (d) `(prompt != 'Q') && (prompt != 'q')`
5. (5 Points) I am writing a program which computes PRT grades. The portion of the program that calculates grades is given below.

```
double push_grade, curl_grade, run_grade, tot_grade;

cin >> push_grade;
cin >> curl_grade;
cin >> run_grade;

tot_grade = push_grade+curl_grade+run_grade / 3;
```

Why do I get incorrect results when I run the program, and how would you correct the program?

6. (4 Points) Which of the following for loops matches this while loop:

```
int i=1;
int sum = 0;
while(i<10)
{
    sum = sum + i;
    i = i + 2;
}
```

- (a)

```
int sum = 0;
for( int i=1 ; i<10 ; i++)
{
    sum = sum + i;
}
```
- (b)

```
int sum = 0;
for( int i=1 ; i<10 ; i++)
{
    sum = sum + i;
    i=i+2;
}
```
- (c)

```
int sum = 0;
for( int i=1 ; i<10 ; i=i+2)
{
    sum = sum + i;
    i=i+2;
}
```
- (d)

```
int sum = 0;
for( int i=1 ; i<10 ; i=i+2)
{
    sum = sum + i;
}
```
- (e) None of these

7. (6 Points) What is wrong with the following statements (if anything)? Which statements produce compile-time errors?

- (a)

```
cout << ++(x + y);
```
- (b)

```
if (x = 5)
    cout << "Got a 5" << endl;
```
- (c)

```
cin >> a, b, c;
```

8. (5 Points) Explain why the following program does not compile, and explain what needs to be done to fix it.

```
#include <iostream>
using namespace std;
int main()
{
    int k;
    cin >> k;
    if (k < 0)
    {
        int n = -1*k;
    }
    else
    {
        int n = k;
    }
    cout << "|" << k
         << "| is " << n
         << endl;
    return 0;
}
```

9. (14 Points) For the following,

```
int n = 3, k = -1;
double x = 3.3;
string s = "find";
```

Give the type and value of each expression:

Expression	Type	Value
<code>x / n</code>		
<code>x > n && n % 2 == 0</code>		
<code>2 / n * x</code>		
<code>x != 5.0 s == "find"</code>		
<code>k = x</code>		
<code>cin >> x</code>		
<code>k++</code>		

10. (4 Points) Why doesn't the following code fragment compile?

```
string s;
cin >> s;
if (s == "down" || "up")
{
    cout << "horizontal";
    cout << endl;
}
```

11. (4 Points) What does the following code print:

```
char c1,c2;
c1 = 'K';
c2 = c1/2;
cout << c2 << endl;
```

12. (6 Points) With supervision you look into your computers memory at a particular byte, and you see that it is 01011000. What is the value of this byte as

- (a) a number in binary?
- (b) a char?
- (c) a bool?

13. (8 Points) Fill in the last row of the following table, which shows a fragment of code that reads input and writes output, shows the user input, and (when you're done) will show the output produced by each code fragment.

Code	double f; cin >> f; cout << f;	int k; cin >> k; cout << k;	char c; cin >> c; cout << c;	string s; cin >> s; cout << s;
User Input	-112.53% +/-6	-112.53% +/-6	-112.53% +/-6	-112.53% +/-6
Program Output				

14. (10 Points) The following rule is used to define leap years:

A leap year is a year that is:

- divisible by 4, but not divisible by 100, or
- divisible by 400.

So note, for instance, that 1900 was not a leap year, but that 2000 is, and 2004 will be. Write a C++ program that accepts as input a year (as an integer), and informs the user of whether or not that year was a leap year.

15. (15 Points) Times for marathon runners are kept the following format: `h:mm:ss`. So for example, my time might be `8:34:08`. Write a program that reads in a list of one or more such times, separated by commas and terminated by a semicolon, and prints out the average time in seconds. typical input might look like:

`3:22:01, 2:58:27, 2:59:23, 3:05:00, 3:08:33;`