Instructions: This homework assignment focuses primarily on some of the basic syntax and semantics of C++. The answers to the following questions can be determined from Chapters 3 through 6 of the lecture notes and Chapters 2 through 6 of the text. Assume any include directives, variable declarations, etc, which are needed to make the given code syntactically correct.

Opscan forms will be passed out in class this week. Print your name and code your ID number on the opscan form. Mark Group 1 if you are in the 8TTH section and Group 2 if you are in the 10MWF section. Turn in your completed opscan at class on March 18th or 19th, or to the 1044 GTAs in McB 116/118 between 12:00 and 3:00 on Friday March 19th. Opscans will not be accepted late or at any other time.

1) What is the value of loopCount after control exits the following loop?

```c++
int loopCount = 1, alpha = 5;
while (loopCount <= 145) {
    alpha = alpha + 7;
    loopCount++;
}
```

1) 1    2) 144    3) 145    4) 146
5) None of these

2) What is the value of someInt after control exits the following loop?

```c++
int someInt = 273;
while (someInt > 500)
    someInt = someInt - 3;
```

1) 270    2) 273    3) 497    4) 500
5) Infinite loop    6) None of these

3) What is the termination condition for the following while loop?

```c++
int beta = 5;
while (beta > 0 && beta < 10) {
    cout << beta << endl;
    cin >> beta;
}
```

1) beta > 0 && beta < 10    2) beta >= 0 && beta <= 10
3) beta < 0 | | beta > 10    4) beta <= 0 | | beta >= 10
5) None of these

4) What is the output of the following code fragment?

```c++
int n = 1;
while (n <= 5) {
    cout << n << " ";
    n++;
}
```

1) 1 2 3 4 5    2) 1 2 3 4
3) 1 1 1 forever    4) 2 3 4 5
5) 2 3 4 5 6    6) None of these
5) What is the output of the following code fragment?

```c++
int n = 1;
while (n < 5) {
    n++;
    cout << n << ' ';
}
```

1) 1 2 3 4 5  
2) 1 2 3 4  
3) 1 1 1 forever  
4) 2 3 4 5  
5) 2 3 4 5 6  
6) None of these

6) What is the output of the following code fragment? (Be careful here.)

```c++
int n = 1;
while (n <= 5)
    cout << n << ' ';
    n++;
```

1) 1 2 3 4 5  
2) 1 2 3 4  
3) 1 1 1 forever  
4) 2 3 4 5  
5) 2 3 4 5 6  
6) None of these

7) Which of the following would be a poor choice for a sentinel value?

1) a value of 999 for voterAge  
2) a value of 1 for testScore  
3) a value of 13 for birthdayMonth  
4) a value of 75 for carSpeed  
5) 2 and 4 above  
6) None of these would be poor choices.

8) With respect to the loop in the following `main()` function, what is missing?

```c++
#include <iostream.h>
int main() {
    int loopCount = 4;
    while (loopCount <= 8) {
        cout << "Hi";
        cout << loopCount++;
    }
    return 0;
}
```

1) the initialization of the loop control variable  
2) the testing of the loop control variable  
3) the incrementation of the loop control variable  
4) Nothing is missing.
9) Indicate where (if at all) the following loop needs a priming read.

```c
int sum = 0;               // line 1
while (inFile)             // line 2
{
    sum = sum + number;    // line 4
    inFile >> number;      // line 5
}
// line 6
```

1) between lines 1 and 2 2) between lines 2 and 3
3) between lines 3 and 4 4) between lines 4 and 5
5) No priming read is necessary.

10) After execution of the following code, what is the value of Length?

```c
int Length = 5,
    Count = 4;
while (Count <= 6) {
    if (Length >= 100)
        Length = Length - 2;
    else
        Length = Count * Length;
    Count++;
}
```

1) 600 2) 100 3) 98 4) 20
5) None of these

11) In the following code fragment, a semicolon appears at the end of the line containing the while condition.

```c
cout << 'A';
int loopCount = 1;
while (loopCount <= 3);
{
    cout << 'B';
    loopCount++;
}
cout << 'C';
```

The result will be:

1) the output AC 2) the output ABC
3) the output ABBBC 4) a compile-time error
5) an infinite loop 6) None of these
12) What is the output of the following code fragment?

```cpp
int Sum = 0,
    outerCount = 1;

while (outerCount <= 3) {
    int innerCount = 1;

    while (innerCount <= outerCount) {
        Sum = Sum + innerCount;
        innerCount ++;
    }
    outerCount ++;
}
```

```
1) 1 2) 4 3) 10 4) 20
5) 35 6) None of these
```

13) What is the output of the following code fragment?

```cpp
const int Limit = 8;
cout << 'H';
int loopCount = 10;
do {
    cout << 'E';
    loopCount ++;
} while (loopCount <= Limit);
cout << "LP";
```

```
1) HLP 2) HELP 3) HEELP 4) HEEELP
5) None of these
```

14) To produce the output 2 4 6 8, what loop condition should be used in the blank below?

```cpp
int n = 0;
do {
    n = n + 2;
    cout << n << ' ';,
} while (_________);
```

```
1) n <= 10 2) n < 10 3) n < 8 4) n >= 2
5) n > 8 6) None of these
```
15) Which for loop is equivalent to the following while loop? Equivalent here means that the value of each of the variables would be the same when the code has completed execution.

```cpp
int count = -5, sum = 0;
while (count <= 15) {
    sum = sum + count;
    count++;
}
```

1) int count, sum = 0;
    for (count = -5; count <= 15; count++)
        sum = sum + count;

2) int count, sum = 0;
    for (count = -5; count <= 15; count++) {
        sum = sum + count;
        count++;
    }

3) int count, sum = 0;
    for (count = -5; count <= 15; count++) {
        count++;
        sum = sum + count;
    }

4) int count, sum = 0;
    for (count = 1; count <= 21; count++)
        sum = sum + count;

5) None of these are equivalent to the given while loop.

16) Which of the loops below produces the same number of loop iterations as the following loop?

```cpp
for (int count = 1; count <= 10; count++)
    DoSomething();
```

1) for (int count = 10; count >= 1; count--)
    DoSomething();

2) for (int count = 0; count < 10; count++)
    DoSomething();

3) for (int count = 10; count >= 0; count--)
    DoSomething();

4) 1 and 2 above  
5) 1, 2, and 3 above  
6) None of these

17) What is the output of the following code fragment?

```cpp
for (int loopCount = 1; loopCount < 3; loopCount++)
    cout << loopCount << ' ';
cout << "Done" << endl;
```

1) Done  
2) 1 Done  
3) 1 2 Done  
4) 1 2 3 Done  
5) 1 2 3 4 Done  
6) None of these
18) What is the output of the following code fragment?

```cpp
for (int loopCount = 1; loopCount > 3; loopCount++)
    cout << loopCount << ' ';
cout << "Done" << endl;
```

1) Done 2) 1 Done 3) 1 2 Done 4) 1 2 3 Done 5) 1 2 3 4 Done 6) None of these

19) In the following code fragment, the programmer mistakenly placed a semicolon at the end of the for statement heading. What is the result?

```cpp
cout << 'A';
for (int count = 1; count <= 3; count++)
    cout << 'B';
    cout << 'C';
```

1) a compile-time error 2) an infinite loop 3) the output ABC 4) the output ABBC 5) the output ABBBC 6) None of these

20) What is the output of the following code fragment?

```cpp
int n = 2;
for (int loopCount = 1; loopCount <= 3; loopCount++) {
    while (n <= 4)
        n = 2 * n;
}
cout << n << endl;
```

1) 4 2) 8 3) 16 4) 32 5) 64 6) None of these