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 and 4 of the lecture notes and Chapters 2 through 4 of the text.

After you have analyzed the questions and decided what answers you believe are correct, you may find it useful to write some short programs to test your logic.

Opscan forms will be passed out in class. Write your name and code your ID number on the opsan form. Turn in your completed opsan at the place and time specified by your Instructor. Opscans will not be accepted at any other place or time.

For questions 1 through 3, select the value of the given C++ arithmetic expression. Note that the presence of a decimal point indicates a double, rather than an int.

1. \(6.0 / 8.0 + 5 / 2 = \)
   \[= 0.75 + 2 = 2.75\]
   1) 0.0  3) 2.75  5) None of these
   2) 2  4) 3.25

2. \(9 / 2 * 2 = \)
   \[= (9 / 2) * 2 = 4 * 2 = 8\]
   1) 2  3) 8  5) None of these
   2) 2.25  4) 9

3. \(14 \% 4 + 3 \% 4 = \)
   \[= 2 + 3 = 5 \quad (3 / 4 \text{ yields 0 with a remainder of 3})\]
   1) 2  3) 4.25  5) None of these
   2) 3  4) 5

For questions 4 through 6, select the value assigned to the relevant variable, given the declarations:

```c
int anInt;
double aDble;
```

4. `aDble = 4 / 5;`
   \((\text{Integer division, yields 0; then cvt to double.})\)
   1) 0.0  3) 1.0  5) None of these
   2) 0.8  4) This is not allowed

5. `anInt = 4 / 5;`
   1) 0  3) 1  5) None of these
   2) 0.8  4) This is not allowed

6. `aDble = 5 / 2.0;`
   \((\text{Mixed, so 5 is cvt'd to a double before division.})\)
   1) 0.4  3) 2.5  5) None of these
   2) 2.0  4) 3.0

7. At the hardware level, the values 5 and 5.0 are stored in exactly the same way.
   1) true  2) false  3) maybe
For questions 8 through 11, assume the following variables have been declared:

```c++
int anInt;
double aDble;
char aChar;
```

and assume the standard input stream `cin` contains the following values, separated by tabs:

```
1.2 4.5 A -46.32
```

Determine the value of the indicated variable after the execution of the given statement; each question is independent, that is, each starts with the stream contents shown above.

8. `aChar` after `cin >> anInt` // extracts 1, and stops before the '.'
   `>> aChar;` // extracts the next one character, '.
   1) 4
   2) '4'
   3) '	' (a tab)
   4) '.'
   5) None of these

9. `aChar` after `cin >> aDble` // extracts 1.2, and stops before the tab
   `>> aChar;` // discards tab, extracts next one character
   1) 4
   2) '4'
   3) '	' (a tab)
   4) '.'
   5) None of these

10. `anInt` after `cin >> aDble` // extracts 1.2, as above
    `>> anInt;` // discards tab, extracts next int value
    1) 2
    2) '4'
    3) 4
    4) 4.5
    5) None of these

11. `anInt` after `cin >> anInt;` // extracts first int value, 1
    `cin.get(aChar);` // gets next single character, '.
    `cin >> anInt;` // extracts next int value, 2
    1) 1
    2) 2
    3) 4
    4) 5
    5) None of these

12. What is printed by the statement: `cout << "The answer is" << setw(3) << 30 + 12;`
    1) The answer is 30 + 12
    2) The answer is 42
    3) The answer is 42
    4) The answer is 30 + 12
    5) None of these

13. Assuming that all variables are of type double, the correct C++ expression for \( \frac{(a+b)c}{d+e} \) is:
    1) \( a + b * c / d + e \)
    2) \( (a + b) * c / d + e \)
    3) \( (a + b) * c / (d + e) \)
    4) \( (a + b * c) / d + e \)
    5) None of these
14. What value is assigned to the variable \texttt{Average} below?

\begin{verbatim}
int x = 4, y = 8, z = 5, w = 4;
double Average = (x + y + z + w) / 4;
\end{verbatim}

1) 5.25  
2) 5  
3) 5.0  
4) 4.75  
5) None of these

15. Given the declaration \texttt{int TestScore = 78;}, which of the output statements given below will produce the output:

\begin{verbatim}
1234567890
Score: 78
\end{verbatim}

1) \texttt{cout} << "1234567890" << endl
   << "Score: " << TestScore << endl;
2) \texttt{cout} << "1234567890" << endl
   << "Score: " " " << TestScore << endl;
3) \texttt{cout} << "1234567890" << endl
   << "Score: " << setw(4) << TestScore << endl;
4) All of the above  
5) 1 and 2 only  
6) 1 and 3 only  
7) 2 and 3 only  
8) None of these

16. Among the binary C++ operators +, -, *, /, and \%, which have the lowest precedence when an expression is evaluated?

1) + and -  
2) * and /  
3) *, /, and \%  
4) +, -, and \%  
5) None of these

17. Suppose that the input stream \texttt{cin} contains the IP address: \texttt{298.173.41.142}.

Assuming that the variables \texttt{A} and \texttt{B} are declared as ints, which of the following code fragments will correctly read the second part of the IP address (173) into the variable \texttt{B}?

1) \texttt{cin} >> \texttt{A};
   \texttt{cin}\_\texttt{ignore}(100, '.');
   \texttt{cin} >> \texttt{B};  
2) \texttt{cin} >> \texttt{A};
   \texttt{char} \texttt{ch};
   \texttt{cin}\_\texttt{get}(\texttt{ch});
   \texttt{cin} >> \texttt{B};
3) \texttt{cin}\_\texttt{ignore}(100, '.');
   \texttt{cin} >> \texttt{B};  
4) \texttt{cin}\_\texttt{get}(\texttt{A});
   \texttt{cin}\_\texttt{get}(\texttt{B});
5) All of the above  
6) 1, 2 and 3 only  
7) 1 and 2 only  
8) 1 and 3 only  
9) 2 and 3 only  
10) None of these
18. A program specification says that a line of input will start with a text label, followed by a tab character, followed by an integer value; for example:

```
Number of nodes:<tab>293
```

Here, <tab> and <newline> indicate the occurrence of a single tab character and a single newline character.

Given the specification, which of the following code fragments will successfully read the integer value into the `int` variable `NetSize`? Assume that `In` is an input file stream variable that has been opened on an input file, and that the data in the stream conforms to the specification.

1) `In.ignore(25, '	');`  
   `In >> NetSize;`

2) `In.ignore(30, '	');`  
   `In >> NetSize;`

3) `In.ignore(25, ':');`  
   `In >> NetSize;`

4) `In.ignore(50, '	');`  
   `In >> NetSize;`

5) All of the above
6) 1 and 2 only
7) 2 and 4 only
8) 1, 2 and 3 only
9) 1, 2 and 4 only
10) None of these

There is a problem with the statement. There's no limit on the length of the label text, so none of the calls to `ignore()` can be guaranteed to work properly. However, if you assumed that the label would be no longer than the sample, then answers 1, 2 and 4 all would work. Answer 3 won't work, in general, because there's nothing in the input specification that says there must be a colon after the label.

Because of the misstatement, we wound up throwing this one out.

For questions 19 and 20, assume that the input file variable `Data.txt` is:

```
1234567890
1234567890
1234567890
1234567890
```

19. What output would the following code fragment produce?

```cpp
ifstream In;
In.open("Data.txt");
char Value;
In.ignore(5, '\n'); // ignores up to the '6'
In >> Value; // reads the next character, '6'
cout << "Value: " << Value << endl;
```

1) Value: 1
2) Value: 2
3) Value: 3
4) Value: 4
5) Value: 5
6) Value: 6
7) Value: 7
8) Value: 8
9) Value: 9
10) Value: 0
20. What output would the following code fragment produce?

```cpp
ifstream In;
In.open("Data.txt");
char Value;
In.ignore(20, '\n'); // ignores the first line
In.get(Value); // reads the first char in the 2nd line
cout << "Value: " << Value << endl;
```

1) Value: 1
2) Value: 2
3) Value: 3
4) Value: 4
5) Value: 5
6) Value: 6
7) Value: 7
8) Value: 8
9) Value: 9
10) Value: 0