“Introduction to C++ Programming” Online Course

Midterm Test

True/False Section. Indicate the best response. (1 point each)

Are these valid C++ names for variables?

___ 1. C3PO

___ 2. total Cost

___ 3. 3D

___ 4. Are these the same floating point constants?
   12345  .12345E-4

On 5 thru 11, are these legal C++ statements, assuming correct data types?

___ 5. while (cin) {

___ 6. X = Y = Z = 6;

___ 7. if (count=7) {

___ 8. cout >> "HELLO WORLD";

___ 9. While (x < 42) {

___ 10. count++;

___ 11. count += 1;
12. The instructions in #10 and 11 above produce the same result.

13. The following is valid but runs forever:
   ```c
   int i = 20;
   int sum = 0;
   while (i>0); {
       sum += i;
   }
   ```

Multiple Choice Section: Choose the best answer (1 point each)

14. We wish to store the total cost of $1,234.56 in a floating point number. Which of these would be the correct constant?
   
   a. $1,234.56   b. 1,234.56   c. 1234.56   d. 123456   e. 1.23456E4

15. Which of the following test conditions is coded correctly?
   
   a. (P > 6. & Q < 5.)  
   b. (A == 4. | B != 3.)  
   c. (I <= 3 & C > 4.)  
   d. (I <= 5 & F >> 6.)

Short Answers Section (2 points each) What results from these calculations?

<table>
<thead>
<tr>
<th>value</th>
<th>Final data type</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>(Indicate Floating point or Integer)</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>16. 1/4</td>
<td>________</td>
</tr>
<tr>
<td>17. 1/4*4</td>
<td>________</td>
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<tr>
<td>18. 1./2*2</td>
<td>________</td>
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<tr>
<td>19. 1+4/8+1</td>
<td>________</td>
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<tr>
<td>20. 5/2*3</td>
<td>________</td>
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</tbody>
</table>
Assume: int I = 3; int J = 4; double X = 2.;
       int N, K; double Y, Z;

<table>
<thead>
<tr>
<th>value</th>
<th>Final data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. N = X/I*J</td>
<td>__________</td>
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<tr>
<td>22. y = X*I/J</td>
<td>__________</td>
</tr>
<tr>
<td>23. Z = X*I/J</td>
<td>__________</td>
</tr>
<tr>
<td>24. K = 9./X</td>
<td>__________</td>
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<tr>
<td>25. K = 9/X</td>
<td>__________</td>
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Section IV - Short coding  (3 points each)

Write legal C++ statements to solve these:

26. `X`=```````B OVER
    `{A`+`2C}

27. `X`=````
    `-B`+`SQRT{{B^2`-
    `^4AC}OVER{2A}}

28. If the totalCost exceeds 200.00, then the shippingCost is 0;
otherwise the shippingCost is $4.00;
29. What is **logically** wrong with the following?

* assume that the child's age as input is less than 20

```cpp
if (age >= 13)
    cout << "teenager\n";
else if (age < 12)
    cout << "school kid\n";
else if (age < 4)
    cout << "toddler\n";
```

30. Correct the above to give proper results

31. Write a loop (not a complete program) that prints 1/N for N = 1, 2, 3, .... 25.

32. Consider the following sequence.
```cpp
int I, J;
I = 3;
while (I <= 8) {
    J = 2 * I;
    I = I - 1;
    cout << I << " " << J << endl;
}
```

What prints out and **why**?
33. What prints out?

```cpp
double result = 0;
int i;
for (i=9; i>1; i-=3) {
    result += 1;
}
cout << result << endl;
```

34. Code the full program here; include the variable definitions for any variables you use. (41 points)

Create the Weather Summary Report. Prompt the user to enter periodic temperature observations or a ^Z to quit. When the end of the data occurs, if there have been any temperatures entered, then display the following three lines:
The high temperature for today was:  99.9
The low temperature for today was:   45.6
The average temperature for today was: 75.6

A sample program run might appear as follows:

Acme Weather Report Program
Enter the next temperature or ^Z to quit: 50.0
Enter the next temperature or ^Z to quit: 55.5
Enter the next temperature or ^Z to quit: 94.5
Enter the next temperature or ^Z to quit: 100.0
Enter the next temperature or ^Z to quit: ^Z

Acme Weather - Today’s Statistics
The high temperature for today was:   100.0
The low temperature for today was:     50.0
The average temperature for today was: 75.0