1. Circle the valid C++ identifiers in the following list (each line contains
one possible identifier):

- abxk
- XY_s
- f2
- double
- 8th_number
- eighth_number
- eighth_number

2. For each of the following arithmetic expressions, give its value and check
off whether the value is integer or floating-point. The first row is filled in
for you:

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
<th>Integer</th>
<th>Floating Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+2</td>
<td>3</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6 - 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 / 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 % 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 / 2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 * 4 % 6 + 4 * 5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Give the values of the integer variables n and m after the following piece
of code has executed:

```cpp
int p=2, q;
p++;
q = p*2;
p = q-1;
q = q+p;
```

```plaintext
p  q
```
4. Consider the following file text file named boxes.dat (the file is in the current directory)

```
2 3 3
1 1 2
```

What is the output of the following program?

```c
#include<iostream.h>
#include<fstream.h>

void main(){
    double height1, width1, length1;
    double height2, width2, length2, area1, area2;
    ifstream infile("boxes.dat");

    infile >> height1 >> width1 >> length1;
    area1 = width1 * length1 + 2 * height1 * width1 + 2 * height1 * length1;
    cout << area1 << endl;

    infile >> height2 >> width2 >> length2;
    area2 = width2 * length2 + 2 * height2 * width2 + 2 * height2 * length2;
    cout << area2 << endl;

    infile.close();
}
```

Output: 

5. Which of the following must every C++ program have?

(a) main
(b) #include
(c) //
(d) cin
6. Which operator will find the remainder when 15 is divided by 6?
   (a) 15 / 6
   (b) 15 % 6
   (c) 6 % 15
   (d) 15. / 6

7. Which of the following is not considered hardware?
   (a) a CPU
   (b) a keyboard
   (c) an operating system
   (d) a hard disk

8. Which of the following will not increment the int variable c by one?
   (a) c++;
   (b) ++c;
   (c) c + 1;
   (d) c += 1;

9. Assume i is 1, j is 2, k is 3, and m is 2. Which code fragment prints YOU WIN to the screen?
   (a) if (i==1 && j>2) cout << "YOU WIN" << endl;
       else cout << "YOU LOSE" << endl;
   (b) if (k-3) cout << "YOU WIN" << endl;
       else cout << "YOU LOSE" << endl;
   (c) if (!(m==j)) cout << "YOU WIN" << endl;
       else cout << "YOU LOSE" << endl;
   (d) if (i+j >= k) cout << "YOU WIN" << endl;
       else cout << "YOU LOSE" << endl;

10. A byte consist of _____ bits.
    (a) 8
    (b) 24
    (c) 255
    (d) 256
11. A variable of char type can assume ___ different values.

(a) 8  
(b) 24  
(c) 255  
(d) 256

12. The decimal representation of the octal number 76 is

(a) 76  
(b) 13  
(c) 62  
(d) 118

13. Syntax is

(a) A list of steps for solving a problem  
(b) A tax on cigarettes or alcohol  
(c) Grammar rules for a programming language  
(d) Approximately one billion bytes

14. Which is the syntax error in the following line of code?

    cout >> "There is an error here!";

(a) The operator >> should not be used with cout.  
(b) There should not be a semicolon at the end of the line.  
(c) The double quotes " should be replaced by single quotes ".  
(d) cout should be replaced by cin.

15. True-false

(a) An expression containing the && operator is true if either or both of its operands are true.  
(b) An expression containing the || operator is true if either or both of its operands are true.  
(c) It is reliable to test the equality of two variables x and y of double type by the expression (x==y).  
(d) In a C++ program, a++ always has exactly the same meaning as ++a.  
(e) After the line of code below has executed, the variable a has value 'B'.

    char a = 'A'; a++;
(f) It is easier to change a number from hexadecimal to binary than it is to change a number from decimal to binary.

(g) C is an object oriented programming language.

(h) C++ is an example of an assembly language.

(i) Forgetting one or both of the braces that delimit a compound statement can lead to a syntax or logic error.

(j) The following line of code generates an error.

\[
\text{const double PI}=3.14159; \quad \text{PI} += 1;
\]

(k) Using a reserved word as an identifier is a syntax error.

(l) The following lines of code print out \text{YOU WIN} to the screen.

\[
\begin{align*}
\text{int a} & = 4; \\
\text{if (a++ == 4) cout} & << \text{"YOU WIN"} \text{<< endl;}
\end{align*}
\]

(m) If the body statement of an \textbf{if} statement is not indented, then a syntax error is generated.

Answers:

1. Only the second, third, and sixth are valid.

2. 
   - row 2: -1, floating point
   - row 3: 0, integer
   - row 4: 3, integer
   - row 5: 5.5, floating point
   - row 6: 20, integer

3. \( p \) is 5, \( q \) is 11.

4. Output:
   
   \[
   33 \\
   8
   \]

5. (a)

6. (b)

7. (c)

8. (c)

9. (d)

10. (a)
11. (d)
12. (c)
13. (c)
14. (a)
15. (a) F  (b) T  (c) F  (d) F  (e) T  (f) T  (g) F  (h) F  (i) T  (j) T  (k) T  (l) F  (m) F