1) Indicate which of the following are legal variable names in C++: (12)

a. `x`
b. `formula1`
c. `average_rainfall`
d. `%correct`
e. `short`
f. `tiny`

g. `total output`
h. `aReasonablyLongVariableName`
i. `12MonthTotal`
j. `marginal-cost`
k. `b4hand`
l. `_stk_depth`

a, b, c, f, h, k, l are legal variables.

2) All C++ programs must have a function named what? (4)

Main()

3) Mark the following statements as true or false. (10)

    a) An identifier can be any sequence of digits and letters. **(F)**
    b) A C++ identifier can start with a digit. **(F)**
    c) The operands of the modulus operator must be integers. **(T)**
    d) If a = 4; and b = 3;, then after the statement a = b; the value of b is still 3. **(T)**
    e) In the statement cin >> y;, y can only be an integer or a double variable. **(F)**

4) The following program has syntax mistakes. Correct them. On each successive line, assume that any preceding error has been corrected. (10)

```cpp
const char = STAR = '*'
const int PRIME = 71;

int main
{
    int count, sum;
    double x;

    count = 1;
    sum = count + PRIME;
    x := 25.67;
    newNum = count * ONE + 2;
    sum + count = sum;
    x = x + sum * COUNT;
    cout << " count = " << count << ", sum = " << sum
        << ", PRIME = " << Prime << endl;
}
```

5) Preprocessor directives begin with which of the following symbols: (2)
    a) *   b) #   c) $ d) !   e) None of these.

6) Suppose a, b, and c are int variables and a = 5 and b = 6. What value is assigned to each variable after each statement executes? If a variable is undefined at a particular statement, report UND (undefined). (18)

```
a = (b++) + 3;
c = 2 * a + (++b);
b = 2 * (++c) - (a++);
```

a	b	c
_	_	_
_	_	_

9   7   UND

9   8   26

10   45   27

7) What is printed by the following program? Suppose the input is (12):

20 15

65

```cpp
#include <iostream>

using namespace std;

const int NUM = 10;
const double X = 20.5;

int main()
{
    int a, b;
    double z;

    char grade;

    a = 25;

    cout << "a = " << a << endl;

    cout << "Enter two integers: ";
    cin >> a >> b;
    cout << endl;

    cout << "The numbers you entered are "
         << a << " and " << b << endl;

    z = X + 2 * a - b;
    cout << "z = " << z << endl;

    grade = 'A';
    cout << "Your grade is " << grade << endl;

    a = 2 * NUM + z;
    cout << "The value of a = " << a << endl;

    return 0;
}
```

20
20 and 15
45.5
A

8) Indicate the values and types of the following expressions: (12)

a. `2 + 3`   d. `3 * 6.0`
b. `19 / 5`   e. `19 % 5`
c. `19.0 / 5`   f. `2 % 7`

a. 5 (int)   b. 3 (int) c. 3.8 (double) d. 18 (int)
e. 4 (int) f. 2 (int)

9) Will the following lines of code print the same thing? Explain why or why not. (5)
cout << 6 << endl;
cout << "6" << endl;

6

6

10) Suppose x, y, and z are int variables and w and t are double variables. What value is assigned to each of these variables after the last statement executes? (6)

x = 17;
y = 15;
x = x + y / 4;

```
z = x % 3 + 4;
w = 17 / 3 + 6.5;
t = x / 4.0 + 15 % 4 - 3.5;
```

x=20
y=15
z=6
w=11.5
t=4.5

11) What is the result of the following expression? (9)

(2+5.0)*4+static_cast<int>(5/2+3.6)-6/4.0

31.5