

Sample Computer Science Placement Exam Questions

These questions are similar to those on the test used to place students in the proper section of the first course in computer science. The number of questions on the placement exam may be different.

Some questions follow C++ usage of `cin` and `cout` for input and output. The meaning of `cin` and `cout` is illustrated by the following program. It uses `cin` to read two integers from the input and uses `cout` to print them to the output. It uses `endl` as the end of line character in the output.

```
main()
{
    int number1, number2;
    cin >> number1 >> number2;        /* read two numbers */
    cout << "The first number that was input was " << number1 << endl;
    cout << "The second number that was input was " << number2 << endl;
}
```

In any problem below, you can assume that any required header files have been included.

Questions 1-5

For each of the following arithmetic expressions, give the value of the expression.

- 1) $7 + 3 * 4$
- 2) $4 + 4 - 1 * 3$
- 3) $6 * 2 - 5$
- 4) $16 / 5$
- 5) $16.0 / 5.0$

Question 6

Complete the following Boolean expression by filling in the three blanks in a way that makes the expression true. Do not use the Boolean operator “!” (not).

If the integer variable `n` is one of the numbers in the range 10, 11, 12, ... 20:

`(n ___ 10) ___ (n ___ 20)`

Question 7

The following program is supposed to read an integer n from the input and write a message saying whether the number that was read is even or odd. Read the program and choose the correct answer.

```
main( )
{
    int n;
    cin >> n;
    if (n mod 2) == 0
        cout << " even";
    else if (n mod 2 == 1)
        cout << "odd";
}
```

- a) The program always gives the correct answer
- b) The program gives the correct answer only for even inputs
- c) The program gives the correct answer only for odd inputs
- d) The program gives the correct answer except when the input is 0
- e) The program never gives the correct answer

Questions 8-13

What value is output by the `cout` statement in each of the following program fragments?

8)

```
int a = 0;
for (n = 0; n < 5; ++n) {
    a += 1;
}
cout << a;
```

9)

```
int a = 0;
for (n = 0; n < 0; ++n) {
    a += 1;
}
cout << a;
```

10)

```
int a = 0;
for (n = 0; n <= 0; ++n) {
    a += 1;
}
cout << a;
```

11)

```

int a = 0;
for (n = 1; n < 5; ++n) {
    for (m = 0; m < 3; ++m)
        a += 1;
    }
}
cout << a;

```

12)

```

int a = 0;
for (n = 1; n < 5; ++n) {
    for (m = 1; m < 1; ++m)
        a += 1;
    }
}
cout << a;

```

13)

```

int a = 0;
for (n = 1; n < 5; ++n) {
    for (m = n; m < 5; ++m)
        a += 1;
    }
}
cout << a;

```

Question 14

The following program is supposed to identify the largest and smallest of n non-negative integers, entered from the input. The integer n is input first (you may assume that it is a positive number). For example, if n is 5 and the numbers input are 3, 2, 7, 0 and 4, the smallest is 0 and the largest is 7.

```

main ( )
{
    int numItems, item;
    _____ smallest, largest; /* put the appropriate type here */
    cin >> numItems;
    _____ ; /* initialize smallest */
    _____ ; /* initialize largest */
    for (i = 1; i < numItem; ++i)
        cin >> item;
        _____ smallest = item; /* put the appropriate statement here */
        _____ largest = item; /* put the appropriate statement here */
}

```