

## CS111 Spring 2020 Midterm 1

## SECTION 1 – General Knowledge - 3 Points Each.

- 1) If a program executes correctly, what traditional value does it return to the operating system?

0

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- 2) Which line of code could cause the compile error “a': redefinition; multiple initialization”?

int a = 1, a =2;

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- 3) Which statement(s) are **false**?

- a) C++ programmers cannot directly access computer memory.
- b) C++ does not have the ability to create objects.
- c) Queens College is located in Queens.
- d) C++ programs are compiled into machine language.
- e) Generally, programs written with higher level languages run quicker and faster than programs written with lower level languages.

A B

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E

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- 3) What is the name of the program that interprets this line of code? `#include <iostream>`

The Pre-  
Processor

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- 4) The compiler does these two things:

a) Checks Syntax

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b) Converts code to machine language

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**SECTION 2 – Operators - 3 Points Each. Answer 7 out of 8. Cross out the question that is not to be graded, otherwise first seven questions will be graded.**

What is the output of the code below?

Q1)

```
int j = 123;
j %= 10, j++, j *= 100;
if(j >= 500)
    cout << j << " ";
    cout << j << " ";
```

Q1) 400

Q2)

```
int i = 473;
cout << i / 100 << (i - ((i / 100) * 100)) / 10 << i - ((i / 10) * 10);
```

Q2) 473

Q3)

```
double d = 1.23;
int i = 1.23;
cout << (i * 100) + ((d - i) * 100);
```

Q3) 123

Q4)

```
int i = rand() % 100;
if(i >= 100)
    cout << i;
else
    cout << i == 100;
```

Q4) 0

Q5)

```
char c = 'Z';
c--;
if(c == 'y')
    cout << 'y';
else
    cout << 'Y';
```

Q5) Y

Q6)

```
char c = 'A';
c += ('c' - 'a');
if (c >= 'a' && c <= 'z')
    cout << "lower case";
else
    cout << c;
```

Q6) C

Q7)

```
int i = 10;
i *= (8 + i);
if ((1 == 2) || ((1/2) == (1/3)) || (i == 18))
    cout << i;
else
    cout << "False";
```

Q7) 180

Q8)

```
cout << ((1 / 2) * 8)
    << " "
    << ((1.0 / 2) * 8);
```

Q8) 0.4

**SECTION 3 – Programming - 10 Points Each - Answer 2 out of 3. Cross out question that should not be graded, otherwise first 2 questions will be graded.**

P1) Write a program that randomly outputs a random letter from the options below:

- a) A random lower case letter ('a'..'z')
- b) A random upper case letter ('A'..'Z')
- c) A random number ('0'..'9')

```
int main()
{
    srand(time(0));
    int type = rand() % 3;
    char c;
    if (type == 0)
        c = 'A' + (rand() % ('Z' - 'A' + 1));
    else if (type == 1)
        c = 'a' + (rand() % ('z' - 'a' + 1));
    else
        c = '0' + (rand() % ('9' - '0' + 1));
    cout << c << endl;
    return(0);
}
```

**P2)** Write a program that asks for two whole numbers. Both numbers must be positive. Replace the last two digits of the first number with the last two digits of the second number.

Sample Input **12 24** → **24**

Sample Input **12 34** → **34**

Sample Input **0 12** → **12**

Sample Input **1234 5678** → **1278**

Sample Input **678 1** → **601**

```
int main()
{
    cout << "take the last two digits of the first number"
         << " from the last two of the first number " << endl;

    //while (true)
    //{
        int i,j;
        cout << "enter digits" << endl;
        cin >> i >> j;
        cout << ((i / 100) * 100) + (j % 100) << endl;
    //}
}
```

P3) Write a program that outputs a random date for the year 2020. You should follow the following rules. Feb. 2020 has 29 days (2020 is a leap year).

January has 31 days

February has 28 days in a common year and 29 days in leap years

March has 31 days

April has 30 days

May has 31 days

June has 30 days

July has 31 days

August has 31 days

September has 30 days

October has 31 days

November has 30 days

December has 31 days

**Good Output: 1/1/2020**

**Good Output: 12/31/2020**

**Bad Output: 9/31/2020**

**Bad Output: 2/30/2020**

```
int main()
{
    srand(time(0));
    int m = 1 + rand() % 12;
    cout << m << "/";
    if (m == 1 || m == 3 || m == 5 || m == 7 || m == 8 || m == 10 || m == 12)
        cout << rand()%31+1 << "/";
    else if (m==2)
        cout << "29/";
    else
        cout << rand()%30+1 << "/";
    cout << "2020";
}
```