

17.5

King Abdullah II School for Information Technology
Computer Science Department
Computer Skills II (C++) Fall 2012 / Second Exam

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Section: 11:00 - 12:30

Question 1 (5 points, 0.5 points each): Given the following C++ program, answer each of the questions below:

```

1. #include <iostream>
2. #include <cmath>
3. using namespace std;
4. void swap (int&, int&);
5. int first (float);
6. int a = 2, b = 1;
7. void main ()
8. {
9.     int a = 5, b = 10;
10.    swap (a, b);
11.    // inner block
12.        float a = 3.5, b = 2.5;
13.        int c = first (a);
14.        cout<<c<<endl;
15.    }
16.    int d = 3;
17.    cout<<a<<endl;
18.    cout<<b<<endl;
19.    cout<<d<<endl;
20. }
21. void swap (int& f, int& g)
22. {
23.     int tmp = f;
24.     f = g;
25.     g = tmp;
26. }
27. int first (float f)
28. {
29.     cout<<f<<endl;
30.     return a;
31. }

```

Handwritten annotations:
 - Line 6: $a=2, b=1$ with boxes around 2 and 1.
 - Line 9: $a=5, b=10$ with boxes around 5 and 10, and arrows pointing to $a \rightarrow f$ and $b \rightarrow g$.
 - Line 12: $a=3.5, b=2.5$ with boxes around 3.5 and 2.5.
 - Line 13: $c=10$ with a box around 10.
 - Line 16: $d=3$ with a box around 3.
 - Line 23: $tmp = f$ with a box around tmp and f .
 - Line 27: $return a$ with a box around a .
 - Line 29: $cout << f << endl$ with a box around f .
 - Line 30: $return a$ with a box around a .

What is the output of the above program?

3.5 ✓
~~3.5~~
~~10~~ ✓
~~5~~ ✓
~~3~~ ✓

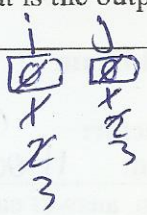
3.5

Put X to indicate the scope of each of the following variables:

	global	main	inner block	swap	first
f in Line 29	⊗	⊗	⊗	⊗	⊗ X
a in Line 12	⊗	⊗	⊗ X		
a in Line 17		X ✓			
a in Line 30			X X		
f in Line 24		X			

Question 2 (3 points) What is the output of the following code?

```
int i = 0, j = 0;
while (i < 3)
{
    while (j < 3)
    {
        j++;
        continue;
        cout << i * j << " ";
    }
    cout << endl;
    cout << i * j << " ";
    i++;
}
```



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Question 3 (3 points) Rewrite the following code using while loop.

```
int value;
for (int i = 0; i < 20; ++i) {
    cin >> value;
    cout << value << endl;
}
```

```
int value;
int i = 0;
while (i < 20)
{
    cin >> value;
    cout << value << endl;
    ++i;
}
```

Question 4 (3 points) Write a function that takes 2 integer variables x and y, returns the multiplication of x and y in variable mul, and returns the division of x on y in variable div. Name the function MultiplyDivide.

```
void MultiplyDivide (int x, int y, int &mul, int &div)
{
    mul = x * y;
    div = x / y;
}
```

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Question 5 (6 points) Write a complete C++ program that asks the user to input an integer and then calls a function named **multiplicationTable**, which displays the results of multiplying the integer by each of the numbers 2 through 10.

```
#include <iostream>
```

```
using namespace std;
```

```
void Multiplication (int a);
```

```
int main ()
```

```
{ int c;  
  cin >> c;
```

```
  Multiplication(c);  
  } returns  
  Table
```

```
void Multiplication (int a)
```

```
{ int i
```

```
  for (int i=2; i<=10; i++)
```

```
  { cout <<
```

```
    int b;
```

```
    b = a * i;
```

```
    cout << b;
```

```
  }
```

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