

- Open-book, open-note, in-class test.
- Put down your answers on paper in an orderly and recognizable fashion.
- You cannot use your C++ compiler during the test.
- Do not pass on the problem set to others.
- Assume x and y are **int** variables **already declared** (i.e. **int x, y;**) when answering the following questions.

1. Consider the following code:

```
if (x<10 && x>=0)
    cout << "Got you";
else
    cout << "Oops!";
```

(i) What would be the output on the screen given that the value of x is -5 immediately before the if statement is executed? (ii) What would be the output given that the value of x is 5 immediately before the if statement is executed? (iii) What would be the output given that the value of x is 25 immediately before the if statement is executed?

2. Consider the following code:

```
if (x<10 || x>=0)
    cout << "Got you";
else
    cout << "Oops!";
```

(i) What would be the output on the screen given that the value of x is -5 immediately before the if statement is executed? (ii) What would be the output given that the value of x is 5 immediately before the if statement is executed? (iii) What would be the output given that the value of x is 25 immediately before the if statement is executed?

3. Consider the following code:

```
if (x<10 && !(x<0) )
    cout << "Got you";
else
    cout << "Oops!";
```

(i) What would be the output on the screen given that the value of x is -5 immediately before the if statement is executed? (ii) What would be the output given that the value of x is 5 immediately before the if statement is executed? (iii) What would be the output given that the value of x is 25 immediately before the if statement is executed?

4. Consider the following code:

```
if (x < 10)
    cout << "Got you";
else
{
    if (x < 20)
        cout << "Alright!";
    else
        cout << "Oops!";
}
```

(i) What would be the output on the screen given that the value of x is 22 immediately before the if statement is executed? (ii) What would be the output given that the value of x is 12 immediately before the if statement is executed? (iii) What would be the output given that the value of x is 2 immediately before the if statement is executed?

5. What would be the output on the screen from the following code?

```
x=0;
while (x < 13)
{
    cout << x << endl;
    x = x+2;
}
```

6. What would be the output on the screen from the following code?

```
for(x=5; x>0; x--)
{
    cout << 2*x << endl;
}
```

7. What would be the output on the screen from the following code?

```

x=0; y=13;
while(y>x)
{
    cout << y;
    y = y -2;
}

```

8. What would be the output on the screen from the following code?

```

x=0;
while (x<3)
{
    y = 0;
    while ( y<3)
    {
        cout << y;
        y = y +1;
    }
    x = x+1;
}

```

9. What would be the output on the screen from the following code?

```

x=0;
while (x<3)
{
    y = 0;
    while( y<x)
    {
        cout << y;
        y = y +1;
    }
    x = x+1;
}

```

10. A buffet restaurant charges their customers according to their ages. If a person is less than 12 years old, the cost is \$0.5 multiplied by the age. If the person is at least 12 years old but no more than 65 years old, the cost is \$8.0. For a senior who is more than 65 years old, they charge \$7.0. Translate the rules above into C++ statements to determine *cost* according to *age*.

```

int age; float cost=0;

```

```
cout << "What is your age?" <<endl;
cin >> age;
```

//Show what would be your code here to determine the cost based on the age

```
cout << "The charge is " <<cost<<endl;
```

11. Speeding on highway ends in a penalty conditional on the actual speed:

| | |
|---|--------|
| More than or equal to 70 mph, and less than 80mph : | \$50; |
| More than or equal to 80 mph, and less than 90mph : | \$75; |
| More than or equal to 90 mph: | \$100; |

Assuming that *speed* and *penalty* are two *double* variables already declared and *speed* has a valid value of speed,

Johnny writes the following piece of code to implement the rules above

```
if (speed >= 70)
    penalty = 50.0;
else if (speed >= 80)
    penalty = 75.0;
else if (speed > 90)
    penalty = 100.0;
else
    penalty = 0;
```

```
cout << penalty << endl;
```

- (i) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 65?
- (ii) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 75?
- (iii) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 85?
- (iv) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 95?

12. Speeding on highway ends in a penalty conditional on the actual speed:

| | |
|---|--------|
| More than or equal to 70 mph, and less than 80mph : | \$50; |
| More than or equal to 80 mph, and less than 90mph : | \$75; |
| More than or equal to 90 mph: | \$100; |

Assuming that *speed* and *penalty* are two *double* variables already declared and *speed* has a valid value of speed,

Johnny writes the following piece of code to implement the rules above

```
if (speed >= 70)
    penalty = 50.0;

if (speed >= 80)
    penalty = 75.0;

if (speed > 90)
    penalty = 100.0;
else
    penalty = 0;

cout << penalty << endl;
```

- (i) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 65?
- (ii) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 75?
- (iii) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 85?
- (iv) What would be the value of *penalty* printed out on the screen by Johnny's code given that the value of *speed* is 95?