

Name: .....

1. [3 pts] Fill the following table.

a = 2, b = 5, c = 6;	output
b = --a; cout << a << " " << b << endl;	1 1
c = a * b++; cout << " " << b << " " << c;	6 10
bool x = (--c > 5); cout << c << " " << x;	5 0

$c = a * b; \quad c = 10$   
 $b = b + 1; \quad b = 6$   
 $c = a * b++$   
 $a = 2$   
 $b = 5 \quad c = 2 * 5$   
 $b = 5 + 1$

2. [2 pts] How many times will the following loop display "Test 3"?

```
for (int i = 0; i < 20; i++)
    cout << "Test 3" << endl;
```

21

$(c) = (b)++ * (a)++;$   
 vs  
 $(c) = (++b) * (++a);$   
 \* Always solve pre for new value

0 → 20  
21 times

3. [2 pts] How many numbers will the following loop display?

```
int i = 1;
while (i < 50)
{
    cout << i << " ";
    i *= i;
}
```

1  
\* It will display infinite number of's

$i = i * i$

$a \neq b$   
 $a = a * b;$

4. [2 pts] What is the last number displayed out when the following fragment executes?

```
for (int i = 1; i <= 5; i++)
{
    cout << i * (i + 1) << endl;
    cout << endl;
}
```

30

Start  
 test  
 body  
 update  
 test  
 body  
 update  
 test  
 body  
 update

start      test      update  
 for (initialization; test; update)

while (test)  
 {  
 statement  
 update  
 }

5. [2 pts] How many times will the following loop display COSC?

```
for (int i = 0; i <= 6; i++)
{
    for (int j = 0; j <= 4; j++)
    {
        cout << "COSC" << endl;
    }
    cout << endl;
}
```

COSC

35

5 x 7  
\*nested\*

The nested loop displays 5 times and then loops 7 times.  
35 total COSC output

6. [2 pts] What is the output of the following code

```
for (int j = 7; j > 4; j--)
    cout << j << " ";
```

← loop  
-1 each time

7

6

5

7. [2 pts] What is the output of the following code

```
int i = 1;
for ( ; i <= 10; i += 2)
    cout << i << endl;
```

→

1

3

5

7

9

8. [4 pts] What would the following code display on the screen.

```
int sum,
    num;
for (sum = 10, num = 0; sum <= 30; num = num + 2)
    sum = sum + num;
cout << num << " " << sum << endl;
```

12 40

9. [3 pts] What would the following code display on the screen.

```
for (int i = 1; i <= 2; i++)
{
    for (int j = 2; j <= 5; j++)
    {
        cout << i << " " << j << endl;
    }
    cout << endl;
}
```

1 2

1 3

1 4

1 5

2 2

2 3

2 4

2 5

cout << i << " " << j << endl;



10. [4 pts] What would the following code display on the screen.

```
int a = 2;

while ( a < 8 )
{
    for (int b = 2; b <= 6; b++)
    {
        cout << a << b << "\t";
        a++;
    }
    cout << endl;
}
```

\* updates are specific  
\* only affects where its nested

22      33      44      55      66  
72      83      94      105      116

11. [4 pts] What would the following code display on the screen.

```
for (int j = 4, k = 7; j <= k; j += 2, k++)
    cout << j << " " << k << endl;
```

j starts 4  
k starts 7  
j = j + 2  
# goes up by 2  
k++ goes up by 1  
j <= k  
stops when j is larger

4      7  
6      8  
8      9  
10      10  
~~12      11~~

12. [4 pts] What would the following code display on the screen.

```
for (int i = 1; i <= 5; i++) \, 2, 3, 4, 5 (5x)
{
    for (int j = 1; j <= i; j++) (5x)
    {
        cout << j << " ";
    }
    cout << endl;
}
```

1  
1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5

i starts 1  
stops 5

1

Question  
The output for if  
cout << j << " " << i;

13. [4 pt]

```
int num = 20, count = 1;
while (num >= 10 && num <= 50)
{
    num += 10;
    count++;
}
cout << count << " " << num << endl;
```

5 60

out of loop  
outputs  
failed  
test

20 >= 10 20 <= 50

num

num = 20 + 10  
count++

1 20 ✓  
2 30 ✓  
3 40 ✓  
4 50 ✓  
5 60 X → output

14. [5 pts]

```
int num = 50, count = 0, sum = 100;
do
{
    num += 50;
    sum += num;
    count++;
}
while (sum <= 500);

cout << count << num << sum << endl;
```

3 200 550  
 count num sum

n = 50 S = 100 C = 0  
 n = 100, S = 200, C = 1  
 n = 150 S = 350, C = 2  
 n = 200, S = 550, C = 3  
 3 200 550

num = 50 + 50  
 sum = 100 + num (each loop)  
 count ++  
 sum <= 500  
 stops

15. [5 pts] Write a code segment that outputs the following; Define all the variables you would use.  
 ABCDEFGHIJKLMNOPQRSTUVWXYZ

char letter;

```
for (letter = 'A'; letter <= 'Z'; letter++)
{
    cout << letter << " ";
}
```