

MIDTERM2 C

Section A – 3 Points Each (do 7 out of 8)

Q1) What is the output of the loop below?

Q1)

X
X
X
X
X
X
X
X
X
X

```
for (int row = 1; row <= 10; row++, cout << endl)
{
    for (int col = 1; col < 10; col++)
        if (col == row)
            cout << "X";
        else
            cout << " ";
}
```

Q2) What is the output of the loop below?

Q2) 10 12 14 16 18

```
for (int i = 10; i < 20; i++)
{
    if (i == 30)
        break;
    cout << i << " ";
    i++;
}
```

Q3) What is the output of the loop below?

Q3) 20

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

Q4) What is the output of the loop below?

Q4) 0 1 2 3 4 5 6 7 8 9

```
for (int i = 0; i < 10; i += 2)
{
    cout << i << " ";
    i--;
}
```

Q5) What is the output of the loop below?

Q5) 0 2 4 6 8

```
for (int i = 0; i < 10; i += 2)
    cout << i << " ";
cout << endl;
```

Q6) What is the output of the loop below?

Q6) 0

```
for (int i = 0; i % 2 == 0; i++)
    cout << i << " ";
cout << endl;
```

Q7) What is the output of the loop below?

Q7) **0 1 2 3 4 5**

```
int i = 0;  
while (1 <= 1)  
{  
    cout << i << " ";  
    if (i == 5)  
        break;  
    i++;  
}  
cout << endl;
```

Q8) What is the output of the loop below?

Q8) **10 9 8 7 6 5**

```
int i = 10;  
do  
{  
    cout << i << " ";  
    i--;  
} while (i > 4);
```

Section B – 10 Points Each (do 3 out 4)

P1)

*Print the numbers between start and finish using a **for** loop**Numbers should be separated by comma**PrintRange2(4,6) ==> 4, 5, 6**PrintRange2(6,4) ==> 6, 5, 4*

```
void PrintRange2(int start, int finish)
{
    bool firstTime = true;
    if (start < finish)
        for(int i =start; i <= finish; i++)
            {
                if (firstTime)
                    firstTime = false;
                else
                    cout << ", ";
                cout << i;
            }
    else
        for (int i = start; i >= finish; i--)
            {
                if (firstTime)
                    firstTime = false;
                else
                    cout << ", ";
                cout << i;
            }
    cout << endl;
}
```

P2)

Print odd numbers between start and finish using a for loop

Numbers should be separated by comma

*You **cannot** assume start is always less than finish*

PrintOddRange(6,4) ==> 5

PrintOddRange(1,10) ==> 1, 3, 5, 7, 9

```
void Swap(int& i1, int& i2)
{
    int temp = i1;
    i1 = i2;
    i2 = temp;
}

void PrintOddRange(int start, int finish)
{
    if (start > finish)
        Swap(start,finish);

    bool firstTime = true;
    while (start <= finish)
    {
        if (start % 2 == 1)
        {
            if (firstTime)
            {
            }
            else
                cout << ", ";
            cout << start;
            firstTime = false;
        }
        start++;
    }
}
```

P3)

Using a while loop, add digits of a number

AddDigits(7777) ==> 28

AddDigits(27) ==> 9

AddDigits(0) ==> 0

int AddDigits(int n)

```
{  
    int sum = 0;  
    while (n)  
    {  
        sum += n % 10;  
        n /= 10;  
    }  
    return(sum);  
}
```

P4)

Use a double for loop to output the following

For example PrintPattern3(10) will output the following...

XXXXXXXXXX

X X

X X

X X

X X

X X

X X

X X

XXXXXXXXXX

void PrintPattern3(int n)

```
{
    for (int row = 1; row <= n; row++)
    {
        for (int col = 1; col <= n; col++)
        {
            if (row == 1 || row == n || col == 1 || col == n)
                cout << "X";
            else
                cout << " ";
        }
        cout << endl;
    }
}
```