EGN 3211 Test 1 T,R Dr. Fernando Gonzalez Spring 2006

NAME Solutions Comp name_____

1. (20%) Write a function that computes $f(\phi)$ of an angle by calling 1 of 4 predefined $f(\phi)$ functions depending on the input parameter passed. The functions: $f1(\phi)$ through $f4(\phi)$ are assumed to be given. Each one is assigned over an area specified.

Use $f1(\phi)$ for $0 \le \phi < \frac{\pi}{2}$ Use $f3(\phi)$ for $\pi \le \phi < \frac{3\pi}{2}$

Use $f2(\phi)$ for $\frac{\pi}{2} \le \phi < \pi$ Use $f4(\phi)$ for $\frac{3\pi}{2} \le \phi < 2\pi$

The function simply needs to see what range the input is in and call the appropriate function. Use a series of "if else" statements to accomplish this.

Example. $f(2)$ returns $f2(2)$ because $\frac{\pi}{2} \le 2 < \pi$

Assume input is in (0, 2π) range.

```
double f(double x)
{
if (x < Pi/2)
    return f1(x);
else if (x < Pi)
    return f2(x);
else if (x < (3/2) * Pi)
    return f3(x);
else if (x < 2*Pi)
    return f4(x);
else
    Printf("error %d is > than Pi", x);
}
```

2. (18%) What is the output of the following code segments?

```
for (x = 0; x < 2; x = x++)
    for (y = 0; y < 8; y = y + 3)
        printf("%d, ", x + y);
```
0, 3, 6, 1, 4, 7,

```
for (x = 25; x > 10; x = x - 5)
    printf("%d, ", x);
```
25, 20, 15,

```
for (x = 1; x < 75; x = x * 5)
    printf("%d, ", x);
```
1, 5, 25,

```
x = 10;
for ( ;x < 10; x = x + 13)
    printf("%d, ", x);
```
no output

```
for (x = 0; x < 10; x = x + 5)
    {
    printf("%d, ", x++);
    x = x - 3;
    }
```
0, 3, 6, 9

```
a = 0;
for (b = 10; a < 5 && b > 0; b = b - 3)
    {
    printf("%d, %d, ", a, b);
    a = a + 1;
    }
```
0, 10, 1, 7, 2, 4, 3, 1,

x	y
0	0
	3
	6
	9
1	0
	3
	6
2	9

x	x
0	25
3	20
6	15
9	10

x	x
1	1
5	5
25	25
125	125

x	x
10	10

x	x
0	10
1	7
-2	4
3	1
4	-2
1	
6	
7	
4	
9	

a	b
0	10
1	7
2	4
3	1
4	-2

3. (20%) For each of the following code segments indicate what is the output. Assume the following declarations: int w = 0, x = 10, y = 20, z = 30;

```
    10      50
if (w + 10 < y + z)
        printf ("True");
else
        printf("False");
```

True

```
      T
if ( w == 0 || ( x + pow(y,k) > z) )
        printf ("True");
else
        printf("False");
```

True

```
  F     F
if (w || x == y)
        printf ("True");
else
        printf("False");
```

False

```
     F
if (x < 3)
        printf ("x >= 3");
else
        printf("x < 3");
```

x < 3

```
  30  F  30
if (y + x > z)
        if (w > 0)
                printf("A");
        else
                printf("B");
else        30     30
        if (y + x >= z)
                printf("C");
        else
                printf("D");
```

C

4. (22%) What is the output of the following program?

```
int  a = 10, b = 20, c = 30, d = 40;

int bill(int a, int x, int *c)
    {
    int d = 100;

    printf("Bill:  a = %d, b = %d, c = %d, d = %d \n", a, b, c, d);
    d = a;
    d = d + b;
    d = d + (*c);
    *c = *c + 3;
    a = 5;
    return *c + d;
    }

void main( )
    {
    int a = 50, x = 60;
    c = bill(a, b, &x);
    a = a + 5;
    b = b + 5;
    c = c + 5;
    d = d + 5;
    x = x + 10;
    printf("main:  a = %d, b = %d, c = %d, d = %d x = %d  \n", a, b, c, d, x);
    }
```

-63+130= 193

20

&main's X

50

file

a	b	c	d
10	20	30	40
	25	193	45
	3	198	
	4	2	2

193 = bill(a, X, *C)

a	X	*C	d
50	20	&main's X	100
			50
			70
			130
			4

main

a	X
50	60
55	63
	73
=	4

output

Bill: a = 50, b = 20, C = &main's X, d = 100

main: a = 55, b = 25, C = 198, d = 45, X = 73

2 3 4 2 4