CSE112 Fall 2004-2005 First Midterm Examination

1 Calculating Cosh *(40 points)*

The hyperbolic cosine, or $\cosh$ function, can be calculated as:

$$\cosh x = 1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \frac{x^6}{6!} + \cdots$$

Write a C function with the following prototype:

```
double cosh(double x, int n);
```

where x is the number we wish to calculate the $\cosh$ of, and n is the number of terms in the above series. For instance, if n is 1, the function should always return 1. You are not allowed to use any math library functions, and specifically not pow().

2 Print an Integer in Base 5 *(40 points)*

Write a C function that takes an unsigned integer n as an argument, and prints it on the screen in base 5. You may *not* assume anything about the number of digits of n. The prototype of the function is:

```
void print_base_5(unsigned int n);
```

So, for instance, if the function is called with 26, it should print 101 on the screen, and if it is called with 50, it should print 20 on the screen. Also, if called with 0, it should print 0 on the screen.

3 Implement XOR *(20 points)*

Write a C function that takes two integer arguments x and y, and returns x ^ y (x XOR y) as its result. In other words, the function should return the same as:

```
int xor(int x, int y)
{
    return x^y;
}
```

except you are *not* allowed to use the ^ operator in your function. So, implement this function (with the same prototype) without using the ^ operator.