

**EE 64100**  
**Homework Assignment #5**

Spring Semester, 2006  
Due Date: May 11, 2006

Please do the following Exercises in the Textbook.

1. Exercise 4.8.
2. Exercise 4.10.
3. Exercise 4.15.
4. Please show that  $x \in Z_N$  has an inverse  $x^{-1}$  if and only if  $(x, N) = 1$ .
5. Let  $x, N$  be relatively prime positive integers with  $x < N$ . Please show that the order  $o_N(x)$  of  $x$  modulo  $N$  is a divisor of the Euler function  $\varphi(N)$  of  $N$ .
6. Exercise 5.2.
7. Exercise 5.4.
8. Exercise 5.5.
9. Exercise 5.6.
10. Exercise 5.9.