EE2302 Foundations of Information Engineering

Assignment 5 **Due: 6 pm, Oct 13**

Full mark: 14 points

1. (6 points)
   a) Write down the multiplication table for modulo 6.
   b) Does the multiplicative inverse of 3 (mod 6) exist? If so, find its value from the table.
   c) Does the multiplicative inverse of 5 (mod 6) exist? If so, find its value from the table.

2. (4 points) Describe all integer solutions to each of the following equations:
   a) $107x + 121y = 1$
   b) $575x + 345y = \gcd(575, 345)$

3. (2 points) Compute $13^{26} \bmod 40$. Show your steps.

4. (2 marks) Use Fermat's Little Theorem to perform the following tasks to compute $9^{794} \bmod 73$.