EE 720: Introduction to Number Theory and Cryptography (Spring 2018) Instructor: Saravanan Vijayakumaran

Indian Institute of Technology Bombay

Date: January 23, 2018

Assignment 2: 10 points

Find the pdf file corresponding to your roll number in the directory https://www.ee.iitb.ac.in/~sarva/courses/EE720/2018/assignments/assignment2/. Upload the answers as a pdf file in Moodle. Use the tex file provided in the directory to fill in your answers. The upload deadline will be 11:00pm IST on Wednesday, January 31, 2018.

1. [5 points] Consider a variant of the one-time pad with message space $=\{0,1\}^l$ and keyspace \mathcal{K} restricted to all l-bit strings with an even number of 1's. Is this scheme perfectly secret? Justify your answer either with a proof or a counterexample.

Solution: Write your answer here

2. [5 points] Let $negl_1$ be a negligible function. Prove that for any positive polynomial p, the function $negl_2$ defined by $negl_2(n) = p(n) \cdot negl_1(n)$ is negligible.

Solution: Write your answer here