

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] State whether the following encryption scheme is perfectly secret or not. Justify your answer either with a proof or a counterexample.

The message space is $\mathcal{M} = \{0, \dots, 4\}$. Algorithm **Gen** chooses a uniform key from the keyspace $\{0, \dots, 5\}$. $\mathbf{Enc}_k(m) = (k + m) \bmod 5$ and $\mathbf{Dec}_k(c) = (c - k) \bmod 5$.

Solution: Write your answer here