Topics of the first written test:

- Modular arithmetics
- Greatest common divisor
- Modular inverse calculation
- Solving linear equations modulo n
- Euler function and its computation
- Probability calculations. For example, given $P(A)$, $P(B)$ and $P(A \cap B)$, find $P(A \cup B)$
- Conditional probability and calculations with it
- Deciding whether a cipher is unbreakable (using the uniqueness theorem)
- Breaking a shift cipher
- Breaking an affine ciprer given two plaintext-ciphertext pairs
- Calculating the index of coincidence and mutual index of coincidence
- Kasiski test on a ciphertext
- Frequency analysis
- Deciding if an element of $\mathbb{Z}_p$ is primitive