1. Given that \( n \) independent random trials are performed and the probability of all failures in the \( n \) trials is at most \( \epsilon \), find the smallest success probability \( p \) of a single trial in terms of \( n \) and \( \epsilon \).

2. Give an informal description of a nondeterministic Turing machine for the language
\[ L = \{0^n1^n \mid \gcd(m, n) > 1\} \]

3. Express the deterministic time complexity of any problem that has nondeterministic time complexity \( O(\log n) \) in terms of \( n \), not \( \log n \).

4. Prove that if \( A \leq_p B \) for all \( B \in NP \) and \( A \) is \( NP \)-hard, then all problems in \( NP \) are \( NP \)-complete.

5. Prove that the problem of checking if there is a clique of even size \( k \) in an undirected graph is \( NP \)-complete.