For the purposes of this problem set, we restrict attention to truth-functional schemata all of whose sentence letters are among $p_1$, $p_2$, $p_3$, and $p_4$. We employ the following terminology in the problems below.

- A list of truth-functional schemata is *succinct* if and only if no two schemata on the list are equivalent.

- A truth-functional schema *implies a list of schemata* if and only if it implies every schema on the list.

- The *power* of a truth-functional schema is the length of a longest succinct list of schemata it implies.

1. (25 points) What is the power of the schema $p_1 \equiv p_2$?

2. (25 points) What is the length of a longest list of schemata no two of which have the same power?

3. (25 points) What is the length of a longest succinct list of schemata each of which has power 256?

4. (25 points) What is the largest number $n$ such that there is a schema of power $n$ and the conjunction of every two schemata of power $n$ is satisfiable?