Assignment 5

1. Assume maximal selection function and try to saturate with ordered resolution system $\mathcal{O}$ the following set of clauses:

   $\{\neg S(x_1) \vee \neg P(x_1, b),\ \neg P(a, x_2) \vee Q(x_2, x_2),\ \neg Q(x_3, y) \vee R(x_3) \vee S(x_3)\}$.

   What can you conclude about the consistency of this set and about similar sets of clauses ?

2. If a set of clauses is such that each of the clauses contains at least one maximal positive literal, is it consistent or it may still be inconsistent?

3. Prove that satisfiability of Horn clauses constructed with no function symbols (i.e. in pure predicate calculus) is decidable. (Hint: use an argument similar to that in the proof of Theorem 4.3.)

4. Prove refutation soundness of supperposition for ground Horn clauses (system $\mathcal{G}$).