Esercizio 1. The language L contains only the binary relations $<$ and e. The theory T_0 says that $<$ is a strict linear order and that e is an equivalence relation. Let $\mathcal{M}$ consist of models of T_0 and partial isomorphisms.

1. Do rich models exist?
2. Can we axiomatize their theory T_1?
3. If so, does T_1 have elimination of quantifiers?
4. Is T_1 λ-categorical for some λ?

Esercizio 2. Let T_0 and $\mathcal{M}$ be as in Example 7.15 except that we restrict the language to the relations $r_0, \ldots, r_n$ for a fixed n.

1. Do ω-rich models of T_0 exist ? If so, let T_1 be the set of sentences that hold in all rich model.
2. Does T_1 has elimination of quantifiers ?
3. Is T_1 ω-categorical ?

Answer the questions above if we add to the language a constant 0 to the language. Answer the questions above when we drop the axioms $\neg\exists x\, [r_n(x) \wedge r_m(x)]$. (Rispondere sinteticamente.)