LOGIC

HW #3

B. Mishra

19 November 2013 (due in 2 weeks)

Q1. [10] Let $K \neq \emptyset$ be a chain of theories in $\mathcal{L}$, i.e., $T \subseteq T'$ or $T' \subseteq T$, for all $T, T' \in K$. Show that $\cup K$ is a theory that is consistent iff all $T \in K$ are consistent.

Q2. [10] Define a *pairing function*: $\wp : \mathbb{N}^2 \to \mathbb{N}$ as $\wp(a, b) = (\sum_{i \leq a+b} i) + a$. Show diagrammatically how it enumerates all pairs $(a, b) \in \mathbb{N}^2$. Give a definition of $\wp$ by means of a bounded μ-operation. Show that $\wp$ is a bijective primitive recursive function.