Type Theory: Bonus Test about Reading Group

Write your name and student number on each paper that you hand in. This test consists of 3 exercises. The first 10 points are free. The final mark is the number of points divided by 10.

Exercise 1 (10+10).

(a). Give the definition of a partial combinatory algebra.

(b). Show that the collection of all λ-terms (not necessarily closed) form a partial combinatory algebra

Exercise 2 (10+10+20). Let D be a partial combinatory algebra.

(a). Give the definition of a D-set.

(b). Give the definition of a modest set.

(c). Show that whenever X and Y are modest sets, then their Cartesian product $X \times Y$ also is a modest set.

Exercise 3 (10+10+20).

(a). Give the definition of a polyset structure.

(b). Let X and Y be polysets of some polyset structure $\mathcal{P}$. Give the definition of the polyset $X \to Y$.

(c). Let $\mathcal{P}$ be a consistent polyset structure. Show that $X \to Y \neq \emptyset$ if and only if $Y = \emptyset$ whenever $X = \emptyset$.