APPLIED CATEGORY THEORY: PROBLEMS

Exercise 1.21 A partition on a set A can be understood in terms of surjective functions out of A. Given a surjective function $f : A \twoheadrightarrow P$ where P is any other set, the preimages $f^{-1}(p) \subseteq A$, one for each element $p \in P$, form a partition of A.

Consider the following partition of $S := \{11, 12, 13, 21, 22, 23\}$:

$$[11, 12 \mid 13 \mid 21 \mid 22, 23]$$

Let $P := a, b, c, d$. Define f such that f models the partitions above.

$$\begin{aligned} f(11) = f(12) &= a \\ f(13) &= b \\ f(21) &= c \\ f(22) = f(23) &= d \end{aligned}$$