1. [4 pts] Define $K_0$ by $K_0(0) = 1$, $K_0(n) = 0$ for all $n > 0$. Prove that $K_0$ is recursive.

2. [4 pts] Let $X \subseteq \bar{\mathbb{N}}$. Assume that $X$ is recursive. Prove that $\neg X$ (= the complement of $X$) is recursive.

3. [4 pts] Let $X, Y \subseteq \bar{\mathbb{N}}$. Assume that $X$ and $Y$ are both recursive. Prove that $X \land Y$ (= $X \cap Y$) is recursive.

4. [4 pts] Prove that the set $Seq$ of all sequence numbers is recursive.

5. [4 pts] Show that the function $C(k, i)$ defined in Theorem 3.1(c) is recursive.

**NOTE:** Your solutions must include enough detail to justify your conclusions.