1. (20) Let \( \theta \) be the finite function such that \( \text{dom}(\theta) = \{0\} \) and \( \theta(0) = 0 \). Prove that if \( B \subseteq C_1 \) and \( \theta \in B \) while \( B \neq C_1 \), then \( B = \{ x : \varphi_x \in B \} \) is productive.

2. (20) Show that there are infinitely many disjoint sets \( B_n \) such that \( B_n \) is productive.

3. (20) Find an example of \( f, g \in C_1 \) and \( B \subseteq C_1 \) with \( f \in B \), and \( g \notin B \) but \( B = \{ x : \varphi_x \in B \} \) is not productive.

4. (20) Problem 13, page 133.

5. (20) Problem 5, page 139.