Questions from the text are denoted by C or BC, depending on whether they are from the Cutland text or from the Bovet and Crescenzi text, followed by the chapter and problem number, separated by a period. For example, C 2.3.3 is problem 3 for chapter 2, section 3 of Cutland.

**Question 1 (C 1.3.3 a,b,c pg. 21)** Show that the following functions are computable by devising programs that will compute them:

(a) \( f(x) = \begin{cases} 0 & \text{if } x = 0 \\ 1 & \text{otherwise} \end{cases} \)

(b) \( f(x) = 5 \)

(c) \( f(x, y) = \begin{cases} 0 & \text{if } x = y \\ 1 & \text{otherwise} \end{cases} \)

**Question 2 (C 1.3.3 pg. 22)** Suppose that \( P \) is a program without any jump instructions. Show that there is a number \( m \) such that either \( f_m^{(1)}(x) = m \) for all \( x \), or \( f_m^{(1)}(x) = x + m \) for all \( x \).

**Question 3 (C 1.4.3 a,b,c pg. 23)** Show that the following predicates are decidable.

(a) “\( x < y \)”

(b) “\( x \neq 3 \)”

(c) “\( x \) is even”

**Question 4** Show that the predicates in the last question are computable.