CSE331
Student ID: _____

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You have to use the designated spaces for your answers. No extra pages will be provided.

Problem 1: Designing Context-Free Grammar (10 points)

Let $\Sigma = \{0, 1, 2\}$. Consider the following language over Σ.

$$L = \{0^i 1^j 2^k \mid i, j, k \geq 0, j + 1 = i + k\}$$

(a) Write down all the five-letter strings in L. (2 points)

(b) Give a context-free grammar for L. (8 points)

(**Hint:** First handle the case where $j = i + k$, and then think of the ways you can add one extra letter.)