CSE 322 **Fall 1999**

Homework 5

Due Friday, November 19, 1999

To justify your answer as to whether or not a language is context-free, provide a CFG if you claim it is; a proof of non-context-free-ness if you claim it is not.

1. [15 points] 2.17 from text.
2. [10 points] 2.19 from text.
3. [10 points] Construct a PDA equivalent to the following grammar:

   $$S \to aAA, A \to aS \mid bS \mid a.$$

   [Note: follow the construction given in class to go from a CFG to an equivalent PDA.]
4. [25 points] Are the following languages context-free? Justify your answer in each case.
   - [5 points] $\{0^p \mid$ p is prime $\}$
   - [10 points] $\{a^n b^n c^m \mid n \leq m \leq 2n\}$
   - [10 points] $\{ww^R w \mid w \in \{0,1\}^*\}$