CS3133

HW#5

DUE: Friday, September 20

1.(4 points) Consider the CFG $G = (\{S, B, C, A\}, \{\text{if}, \text{then}, \text{else}, c_1, c_2, c_3, a_1, a_2, a_3\}, P, S)$ with productions:

$S \rightarrow \text{if } C \text{ then } B \mid B$

$B \rightarrow \text{if } C \text{ then } B \mid \text{if } C \text{ then } B \text{ else } S \mid A$

$C \rightarrow c_1 \mid c_2 \mid c_3$

$A \rightarrow a_1 \mid a_2 \mid a_3$

Is *G* ambiguous? Justify your response.

2. (5 points) Consider the set *L* consisting of all binary strings with exactly the same number of 0's as 1's. That is, $110001 \in L$, $e \in L$ and $11000 \notin L$. Prove that *L* is context free by describing a PDA which accepts *L* by final state. Show a computation (sequence of ID's) to accept 110001.