CS 350 Theory of Computation

Assignment 4 (8 marks)

Question 1 (1 marks)
Let $B$ be the set of all infinite sequences over $\{a, b\}$. Show that $B$ is uncountable, using a proof by diagonalization.

Question 2 (1 marks)
Let $T = \{(i, j, k) | i, j, k \in \mathbb{N}\}$. Show that $T$ is countable.

Question 3 (2 marks)
Let $A = \{(R, S) | R$ and $S$ are regular expressions and $L(R) \subseteq L(S)\}$. Show that $A$ is decidable.

Question 4 (2 marks)
Show that $EQ_{CFG}$ is undecidable.

Question 5 (1 marks)
Show that $EQ_{CFG}$ is co-Turing-recognizable.

Question 6 (1 marks)
Problem 5.3 (page 211—second edition of Sipser).

Date Due: before the end of class on Thursday, April 2, 2009. No late assignment will be accepted.