Midterm Exam I

Time: 1 hour 15 minutes. Exam is closed book, notes and any other aids including electronic.

Name: **ID:**

Problem 1 ≈20%

Find a regular expression corresponding to each of the following languages over $\Sigma = \{a, b\}$ ...

Problem 2 ≈15%

Mathematical or structural induction for languages, FA, NFA, etc. (including definitions)

Problem 3 ≈20%

4-5 statements about regularity of languages. For each statement, decide whether it is true or false. If it is true, prove it. If it is not true, give a counterexample.

Problem 4 ≈20%

Establishing regularity or nonregularity; The pumping lemma; L-distinguishability

Problem 5 ≈10%

Construct finite automata

Problem 6 ≈15%

Nondeterminism: NFA to FA; RE to NFA; NFA to RE; Kleene thm.
Theory question