Quiz #4 CS361 Spring 2017 Name: Alexander Molodyh

I. True or False (1 Point each for the best 8, answer all)

____1. The set of states Q in a DFA can be empty. When Q is not empty, the DFA can have more than one start state.
____2. Let's A, p, and s be defined as in the Pumping Lemma, if s = xyz, then s'= xz must also be in A. In addition, the Pumping Lemma for NFA is mostly used to prove that a language is actually regular
____3. Any language accepted by a NFA can also be accepted by a DFA.
____4. The class of regular language is closed under the concatenation operation.
____5. A NFA is considered as a special case of a DFA.
____6. If machine M has two input symbols that transit to q_2 from q_1, then M cannot be a DFA.
____7. Every CFG has an equivalent NFA, and every DFA has an equivalent CFG.
____8. If a DFA has n states, it cannot accept strings with a length greater than n^2.
____9. $A = \{0^n1^n\}$ can be accepted by a PDA.

II. Short answers (2 points each)

1. Show your state diagram of a NFA **or** DFA that accepts strings containing 1100, such as 00**1100**1.

2. Let A={a, b} and B={0, 1} show $A \cup B$ and $A \circ B$. Then explain what is A^* and show all strings in A^* that have a length smaller than 3.

II. Short answers (4 points)

1. Design a DFA or NFA that accepts regular expression $(01U10)^*$.

2. Design a PDA that accepts $E = \{0^i1^j \mid i > j\}$. You may have to use the back page.