Name: ______________________________ Student ID:

Math 166 - Theory of Computability - Fall 1999

Quiz #4 — October 28

1. Let $L = \{w \in \{a, b, c\}^* : w \text{ has } ab \text{ or } ac \text{ as a substring.}\}$

   (a) Give a regular expression describing L.

   (b) Give a regular expression describing $\overline{L}$.

2. Now let L be the set of strings in $\{a, b, c\}^*$ which have odd length. For each language in the left column, find an equal language in the right column (if any).

___ (a) $L \cup \emptyset$	1. L
___ (b) $L \cup \{\varepsilon\}$	2. $\{\varepsilon\}$
___ (c) $L \circ \emptyset$	3. $\emptyset$
___ (d) $L \circ \{\varepsilon\}$	4. $\{a, b, c\}^*$.
___ (e) L^*	5. None of the above.

3. Draw the state diagram of a DFA which is equivalent to the following NFA: