Ma2201/CS2022
Quiz 1100

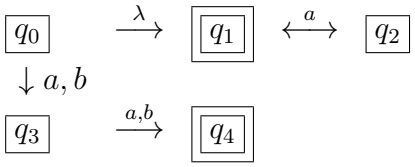
Foundations of C.S.

Spring, 2019

PRINT NAME: _____

$\mathcal{SIGN}$: _____

1. Draw the state diagram for a non-deterministic finite automaton whose language is $(a^2)^* \cup (a \cup b)^2$.



a) (4 **pts**) Fill in the table of the state transition function

state	$\lambda-$closure	a	b
q_0			
q_1			
q_2			
q_3			
q_4			

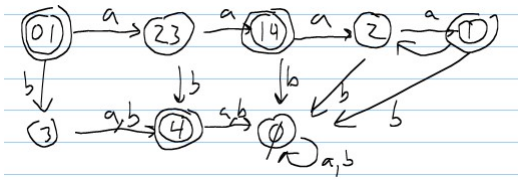
♣

state	$\lambda-$closure	a	b
q_0	$\{q_0, q_1\}$	$\{q_2, q_3\}$	$\{q_3\}$
q_1	$\{q_1\}$	$\{q_2\}$	$\emptyset$
q_2	$\{q_2\}$	$\{q_1\}$	$\emptyset$
q_3	$\{q_3\}$	$\{q_4\}$	$\{q_4\}$
q_4	$\{q_4\}$	$\emptyset$	$\emptyset$

♣

b) (5 **pts**) Use part a to draw the diagram of the deterministic finite automaton with the same language.

♣ *Our algorithm gives*



Note that states $\{q_1\}$ and $\{q_1, q_4\}$ are indistinguishable, and can be combined if desired.
♣