

Name: _____

Grade: _____ <-- instructor use

1. A DFSM M is a 5-tuple $(K, \Sigma, \delta, s, A)$. What do each of the symbols represent?

K

Σ

δ

$\delta: (X) \rightarrow$

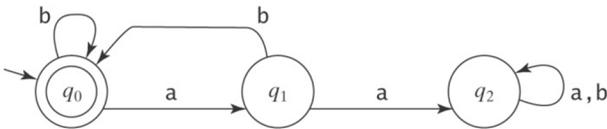
s

A

2. In the notation of problem 1, what is the initial configuration if M is to process the input string w ?

3. $(q, w) \vdash_M (q', w')$ iff $\delta(\quad , \quad) = \quad$ [The \vdash_M symbol is read “yields in machine M ” or simp ’]

4. For the following FSM, show the computation (sequence of configurations) if the input string is $abaab$.



5. What does it mean for a DFSM to “accept” a string?

6. Prove: Every DFSM M , in configuration (q, w) , halts after $|w|$ transitions.

7. Is the following problem decidable? Given a DFSM M and a string $w \in \Sigma_M^*$, is $w \in L(M)$? Yes No
 Explain briefly.

8. A language L is *regular* iff

9. Draw the transition diagram (or transition table) for a DFSM that accepts
 $\text{OddParity} = \{w \in \{0, 1\}^* : w \text{ contains an odd number of } 1\text{s}\}$

