Name:			Grade:	< instructor use	
1.	A DFSM M is a 5-tuple (K, $\Sigma$ , $\delta$ , s, A). What do each of the symbols represent?				
	К				
	Σ				
	δ	δ:(	Х	) $\rightarrow$	
	S				
	A				

- 2. In the notation of problem 1, what is the initial configuration if M is to process the input string w?
- 3.  $(q, w) \mid_{-M} (q', w')$  iff  $\delta($ ,  $) = [The \mid_{-M} symbol is read "yields in machine M" or simp "]$
- 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 OddParity =  $\{w \in \{0, 1\}^* : w \text{ contains an odd number of } 1s\}$

10. Draw the transition diagram (or transition table) for a DFSM that accepts  $\{w \in \{a, b\}^* : no \text{ two consecutive characters are the same}\}.$ 

11. In terms of the formal definitions, what is the major difference between the five components of a DFSM and a NDFSM?

12. What are the two sources of nondeterminism in a NDFSM diagram?

13. Tell your instructor about anything from today's session (or from the course so far) that you found confusing or still have a question about. If none, please write "None". Continue on the back if needed.