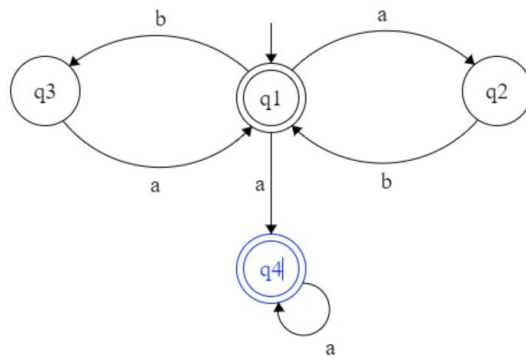
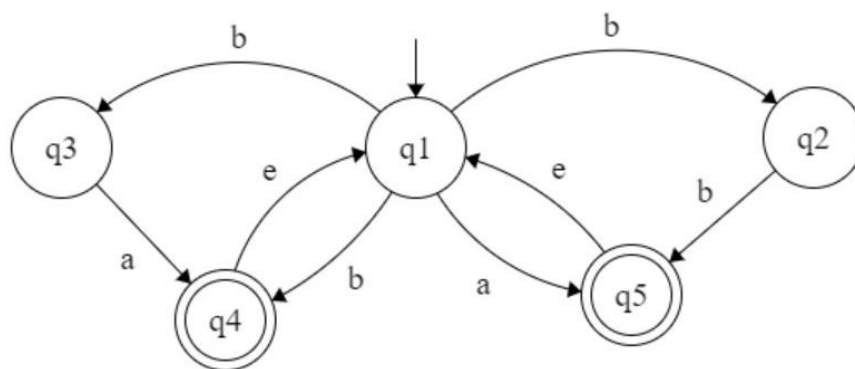


1. Draw a state diagram for nondeterministic finite automata that accepts the following languages  
There can be multiple answers, below is one example answer.

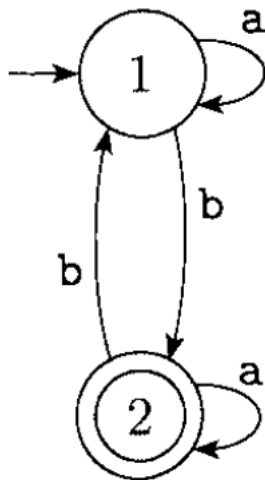
1.1  $((ab)^*(ba)^*) \cup aa^*$



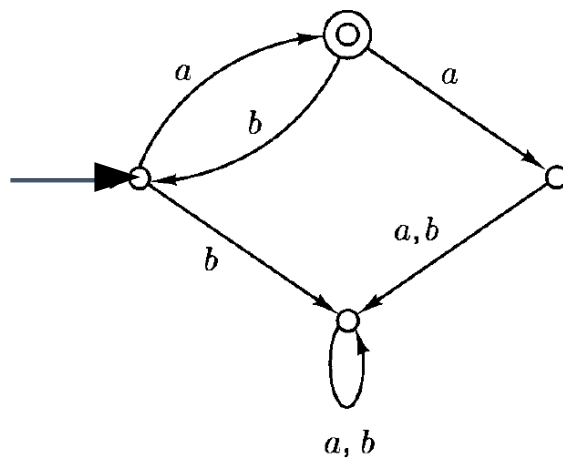
1.2  $(ba \cup b)^* \cup (bb \cup a)^*$



2. Give the regular expression for the language accepted by the following finite automaton:  
There can be multiple answers, below is one example answer.



Ans.  $(a^*ba^*b)^* \cup aba^*$



Ans.  $a(ba)^*$

3. Write the regular expression for the following sets

3.1 All strings over  $\{a, b\}$  that are odd in length

$a(ba)^*$

3.2 All strings over  $\{a, b\}$  that end with  $bb$

$a^*b^*(bb)^*$