

1. (10) Let $X = \{aa, ba\}$, $Y = \{a,b,ab\}$.

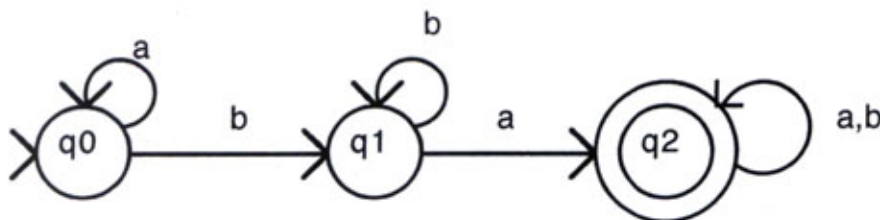
- a) List the strings in XY .
- b) List the strings in X^* of length four or less.

2.(10) Let $X = \{aa\}$ and $Y = \{a,b\}\{a,b\}\{a,b\}$. Describe the strings in Y^* and in $X^* \cap Y^*$.

3.(10) Give a regular expression for the strings over $\{a,b\}$ containing the substring aba .

4.(10) Give a regular expression for the set of strings over $\{a,b,c\}$ that begin with a and have exactly two b 's.

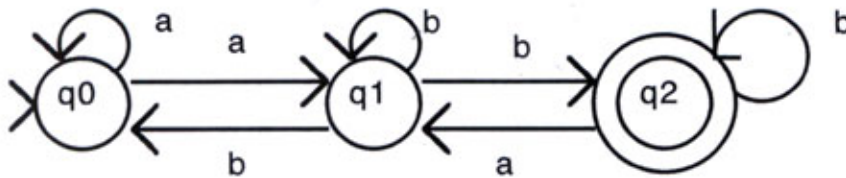
.5. (15) Let M be the DFA whose state diagram is given here:



- a) Give the transition table for M .
- b) Give a regular expression for $L(M)$.

6. (15) Give the state diagram for a *complete* DFA that accepts $a(ba)^*$.

7. (15) Let M be the NFA whose state diagram is given here:



- a) Show the transition table for M .
- b) Trace all computations of $abba$.
- c) Is $aabbaab$ accepted by M ?

8. (15) Let M be the NFA given here:



Show the state diagram of a DFA equivalent to it.