BLG 311E – FORMAL LANGUAGES AND AUTOMATA
SPRING 2016
HOMEWORK 3

1. Consider the regular expression (aVb)*abb(aVb)*.

- **a.** Construct and draw the NFA accepting the regular expression.
- **b.** Construct and draw the DFA for this NFA.
- **c.** Reduce the DFA if necessary.

2. Consider the following state transition diagram of DFA in Moore model.

	a	b	c	Output
q0	q1	q7	q7	1
q1	q2	q3	q4	0
q2	q2	q5	q7	0
q3	q6	q3	q7	0
q4	q3	q2	q7	0
q5	q1	q7	q7	1
q6	q1	q7	q7	1
q7	q7	q7	q7	0

$K = \{q0, q1, q2, q3, q4, q5, q6, q7\}$
$F = \{q0, q5, q6\}$
$s = \{q0\}$
$\sum = \{a, b, c\}$

- **a.** Reduce the table if necessary. Draw the state transition diagram of the (reduced) DFA.
- **b.** Which ones of the following regular expressions are accepted by this DFA?
  - i. L(M) = {a[(b V ca)b* a V (a V cb)a*b]}*
  - ii. L(M) ={a[(b V ca)b* a V (a V cb)a*b]}$^{+}$
  - iii. L(M) = {a[(b V c)b a V (a V cb)ab]}*

IMPORTANT: You must do this homework **by hand** and **submit it using the box in the secreteriat**.