

EEL702: Minor I

August 28, 2014

Maximum Marks: 15

- Describe, in words (as concisely as possible), the languages denoted by the following regular expressions:
 - $0(0|1)^*0$
 - $(0|1)^*0(0|1)(0|1)$
 - $(00|11)^*((01|10)(00|11)^*(01|10)(00|11)^*)^*$ [3]
- Write regular expressions for the following languages:
 - All strings of English letters such that the letters are in lexicographic order. [3]
 - All binary strings that do not contain the substring 100. [3]
- Construct the minimum-state DFA for the following regular expression: $(a|b)^*a(a|b)(a|b)(a|b)$. Use the sequence of conversion algorithms discussed in class, and show all your working clearly. [5]
- Construct a regular expression for the below automaton, using the state elimination method. Show all working clearly. Can you think of a shorter regular expression that is equivalent to the one obtained? Could you have somehow simplified the given automaton so that it led to this simpler regular expression in the first place? [4]

