

SABANCI UNIVERSITY

Faculty of Engineering and Natural Sciences CS 302 Automata Theory Fall 2019

Midterm Answers

Answer 1 (50 points)

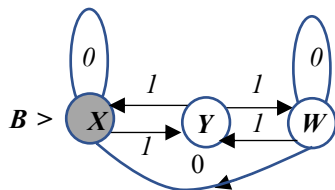
(a) (15 pts)

$$E = (0^*.(1.1.1+1.0.1).0^*)^*$$

(b) (10 pts)

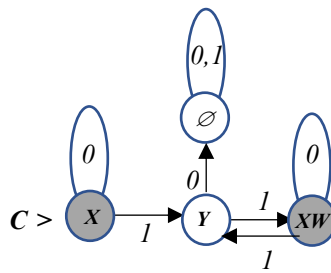
$$E_A = (0+1.1)^*$$

(c) (i) (8 pts)



(ii) (8 pts)

state	input	next
$> *X$	0	X
X	1	Y
Y	0	\emptyset
Y	1	X, W
$*X, W$	0	X, W
X, W	1	Y

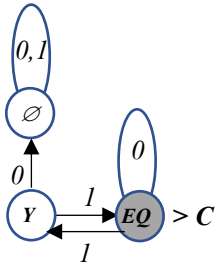


(iii) (9 pts)

X Y X, W \emptyset

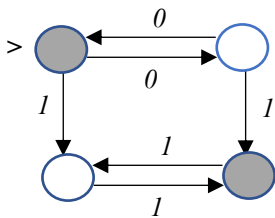
	1	equ.	1
		1	2
			1

Hence X and X, W are equivalent and minimum state machine D is as below.



Answer 2 (50 points)

(a) (25 pts) L is a regular language accepted by the following *NFA*



(b) (25 pts) L is a non-regular context free language and is generated by the following

CFG $G = (\{S\}, \{0,1\}, P, S)$ where P is as below

P :

$S \rightarrow 0SI \mid \emptyset$

