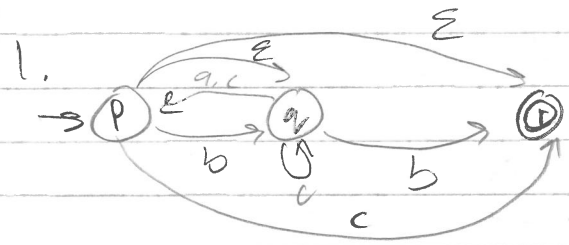
note: $\varepsilon a = a\varepsilon = a$

Justin Schrader
Hw 4
CSCE 355

1.



	a	b	c
*→p	{p,q,r}	{q,r}	{p,q,r}
q	{p,q,r}	{r}	{p,q,r}
*r	∅	∅	∅

	ε^*	a	ε^*
p	p	∅	∅
	q	p	pqr
	r	∅	∅
q	q	p	pqr
r	r	∅	∅

	ε^*	b	ε^*
p	p	q	q
	q	r	r
	r	∅	∅
q	q	r	r
r	r	∅	∅

2.a.

	ε^*
p	p,q,r
q	q
r	r

b. ε, c, εb, ~~bb~~, ~~bcb~~, bac, bcc, εcb, εac, εcc, ~~baε~~, ~~bcε~~, ε, εaε, εcε,

Should have 37 strings

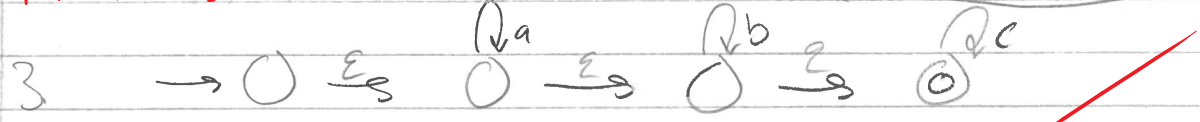
c.

	a	b	c
→*p	pqr	qr	pqr
*qr	pqrs	rs	pqrs
*pqr	pqrs	qrs	pqrs
*rs	s	s	s
*qrs	pqrs	rs	pqrs
*pqrs	pqrs	qrs	pqrs
s	s	s	s

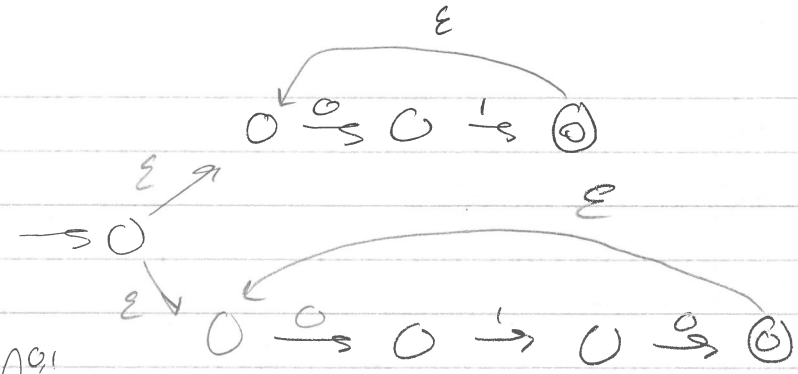
What is s?

	ε^*	c	ε^*
p	p	r	r
	q	p	pqr
		q	q
	r	∅	
q	q	p	pqr
		q	q
r	r	∅	∅

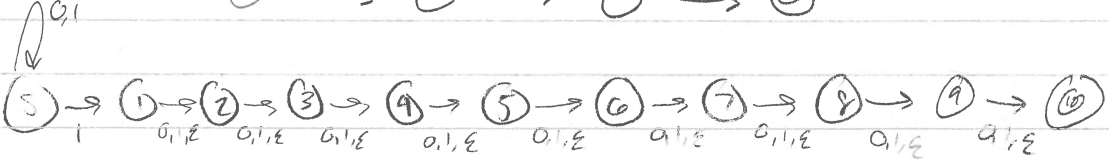
3



4.b.



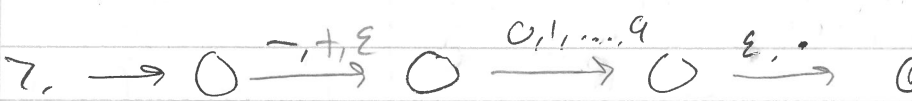
4.c.



5

6.

7.



8. $(0+1)^* \mid (0+1)^* (0+1)^* (0+1)^* \ldots (0+1)^*$

9. 3.13 a. $(0^*1^*0^*) + (0^*1^*000^*1^*)$ accepts 10, and 1 is not divisible by 5.

b.

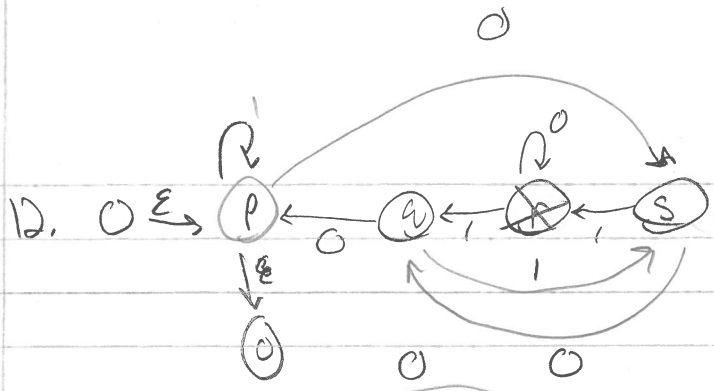
10. $L = \{\varepsilon, 0, 10, 00, 010, 1010, \ldots, 1, 11, 111 \ldots\}$ Not an English description!

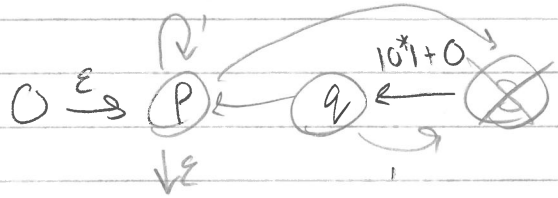
11. $a^*(b+c)^*$

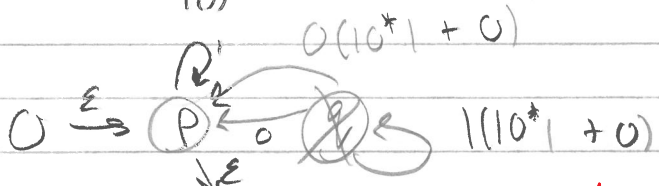
12. → Next Page.

r → s → q → p

12.



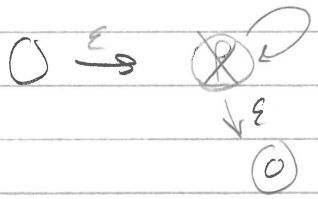




not yet

$$1^* + (0(10^*1 + 0)(1(10^*1 + 0))^* 0)^*$$

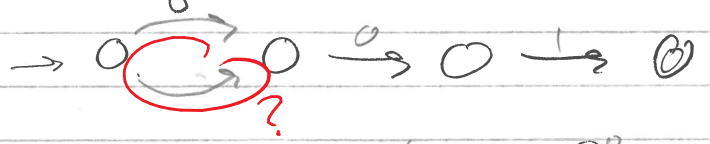
not yet



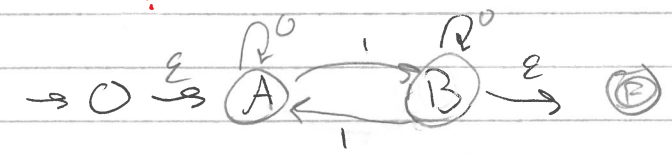
$$\varepsilon (1^* + (0(10^*1 + 0)(1(10^*1 + 0))^* 0)^*)^* \varepsilon$$

— drop the ε ($\varepsilon a = a\varepsilon = a$)

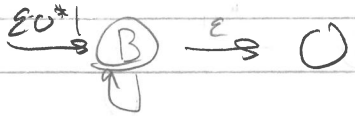
13.



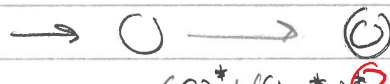
14. a.



b.



$10^*1 + 0^*$



$$\varepsilon 0^*1((10^*1)^* 0)^* \varepsilon$$

no!

15.

$$3*01*(0^* + (10^*1)^*0)1*03 + 3*03$$

ไม่ได้