Tarea 9
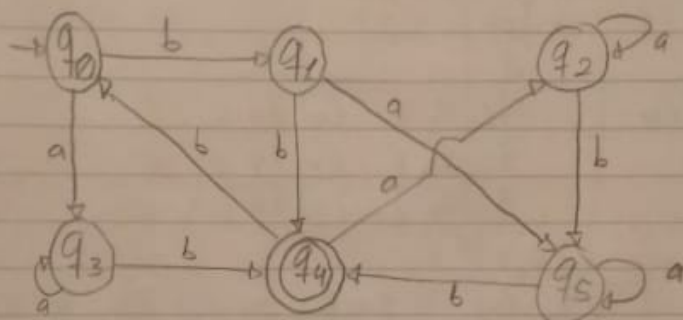
1- Encontrar el AFD mínimo equivalente a los AFDs cuyos diagramas se muestran en las sigs. figura

$C_1 = \{q_4\}$ $C_2 = \{q_0, q_1, q_2, q_3, q_5\}$

C_1

S	a	b
q_4	$q_2 \in C_2$	$q_0 \in C_2$

C_2

S	a	b
q_0	$q_3 \in C_2$	$q_1 \in C_2$
q_1	$q_5 \in C_2$	$q_4 \in C_1$
q_2	$q_2 \in C_2$	$q_5 \in C_2$
q_3	$q_3 \in C_2$	$q_4 \in C_1$
q_5	$q_5 \in C_2$	$q_4 \in C_1$

$C_1 = \{q_4\}$, $C_3 = \{q_0, q_2\}$, $C_4 = \{q_1, q_3, q_5\}$

C_1

S	a	b
q_4	$q_2 \in C_3$	$q_0 \in C_3$

C_3

S	a	b
q_0	$q_3 \in C_4$	$q_1 \in C_4$
q_2	$q_2 \in C_3$	$q_5 \in C_4$

C_4

S	a	b
q_1	$q_5 \in C_4$	$q_4 \in C_1$
q_3	$q_3 \in C_4$	$q_4 \in C_1$
q_5	$q_5 \in C_4$	$q_4 \in C_1$

* $C_1 = \{q_4\}$, $C_2 = \{q_0\}$, $C_3 = \{q_2\}$, $C_4 = \{q_1, q_3, q_5\}$

C_1

δ	a	b
q_4	$q_2 \in C_3$	$q_0 \in C_2$

C_2

δ	a	b
q_0	$q_3 \in C_4$	$q_1 \in C_4$

C_3

δ	a	b
q_2	$q_2 \in C_3$	$q_5 \in C_4$

C_4

δ	a	b
q_1	$q_5 \in C_4$	$q_4 \in C_1$
q_2	$q_3 \in C_4$	$q_4 \in C_1$
q_3	$q_5 \in C_4$	$q_4 \in C_1$

* $C_1 = \{q_4\}$, $C_2 = \{q_0\}$, $C_3 = \{q_2\}$, $C_4 = \{q_1, q_3, q_5\}$

b)

Inicial

$C_1 = \{q_2, q_3\}$ $C_2 = \{q_0, q_1, q_4, q_5\}$

C_1

S	a	b			
q_2	$q_1 \in C$	$q_5 \notin C$	(2,2)	(2,3)	(3,5)
q_3	$q_4 \in C$	$q_5 \notin C$	(2,2)	(3,3)	(4,5)

C_2

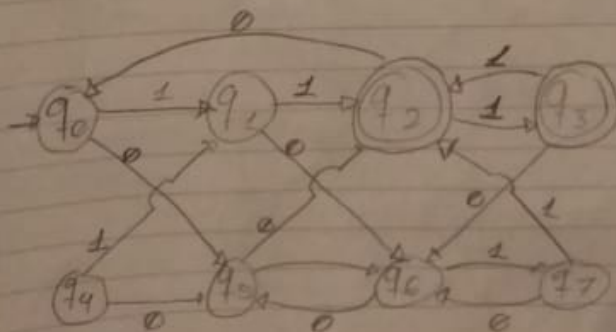| S'	a	b			
q_0	$q_1 \in C$	$q_3 \notin C$	(2,1)	(2,1)	(3,2)
q_1	$q_0 \in C$	$q_2 \notin C$	(2,1)	(2,1)	(3,1)
q_4	$q_5 \in C$	$q_4 \in C$	(2,2)	(3,3)	(5,4)
q_5	$q_5 \in C$	$q_1 \in C$	(2,2)	(3,2)	(5,3)

$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_1\}$, $C_3 = \{q_4, q_5\}$

$C_1 = \{q_2\}, C_2 = \{q_3\}, C_3 = \{q_0, q_1\}, C_4 = \{q_4\}, C_5 = \{q_5\}$

$C_1 = \{q_1\}, C_2 = \{q_3\}, C_3 = \{q_0\}, C_4 = \{q_1\}, C_5 = \{q_4\}, C_6 = \{q_5\}$

No tiene AFD mínimo. //

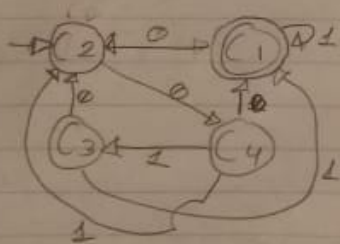c) ~~Determine el AFD mostrado en la figura ~~ es equivalente

c)

$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_1, q_4, q_5, q_6, q_7\}$

C_1

δ	0	1		
*q_2	q_0	q_3	2,1	2,1
q_3	q_6	q_2	2,1	2,1

C_2

δ	0	1			
→q_0	q_5	q_1	2,2	4,3	C_2
q_1	q_6	q_2	2,1	2,1	C_3
q_4	q_5	q_1	2,2	4 3	C_2
q_5	q_2	q_6	1,2	1,2	C_4
q_6	q_5	q_7	2,2	4,3	C_2
q_7	q_6	q_2	2,1	2,1	C_3

$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_4, q_6\}$, $C_3 = \{q_1, q_7\}$, $C_4 = \{q_5\}$
$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_4, q_6\}$ $C_3 = \{q_1, q_7\}$, $C_4 = \{q_5\}$
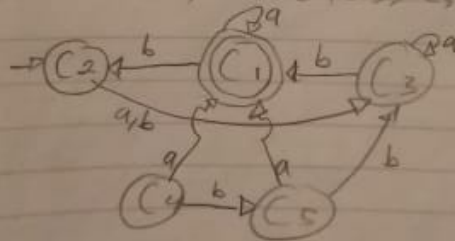

e)

$C_1 = \{q_4\}$, $C_2 = \{q_0, q_1, q_2, q_3, q_5\}$

C_1
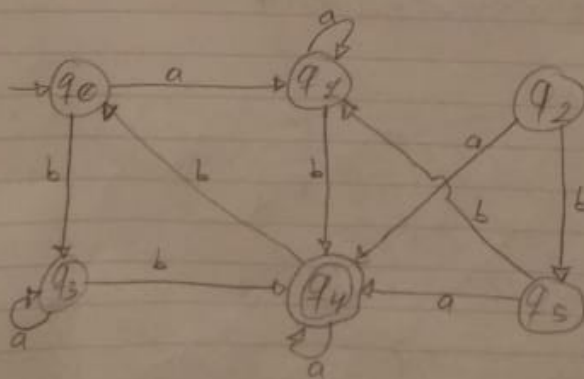
S	a	b				
* q_4	q_4	q_0	1,2	1,2	1,2	C_1

C_2

S	a	b				
→ q_0	q_1	q_3	2,2	3,3	3,3	C_2
q_1	q_1	q_4	2,1	3,1	3,1	C_3
q_2	q_4	q_5	1,2	1,4	1,5	C_4
q_3	q_3	q_4	2,1	3,1	3,1	C_3
q_5	q_4	q_1	1,2	1,3	1,3	C_5

$C_1 = \{q_4\}$, $C_2 = \{q_0\}$, $C_3 = \{q_1, q_3\}$, $C_4 = \{q_2, q_5\}$

$C_1 = \{q_4\}$, $C_2 = \{q_0\}$, $C_3 = \{q_1, q_3\}$, $C_4 = \{q_2\}$, $C_5 = \{q_5\}$

$C_1 = \{q_4\}$, $C_2 = \{q_0\}$, $C_3 = \{q_1, q_3\}$, $C_4 = \{q_2\}$, $C_5 = \{q_5\}$

d)
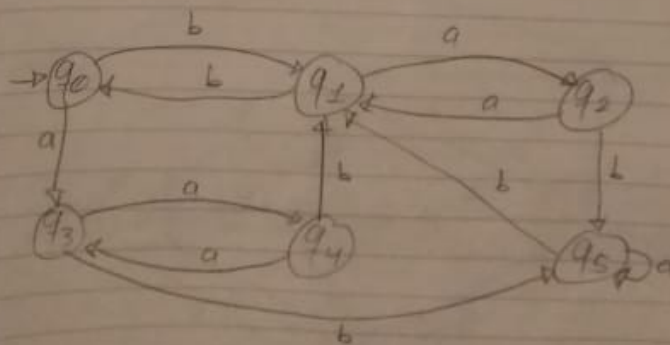
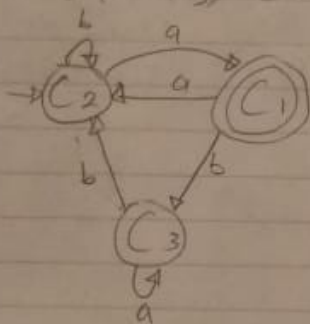$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_1, q_4, q_5\}$

C_1

S	a	b			
* q_2	q_1	q_5	2,2	2,3	C_1
* q_3	q_4	q_5	3,2	2,3	C_1

C_2

S	a	b			
→ q_0	q_3	q_1	1,2	1,2	C_2
q_1	q_2	q_0	1,2	1,2	C_2
q_4	q_3	q_1	1,2	1,2	C_2
q_5	q_5	q_1	2,2	3,2	C_3

$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_1, q_4\}$, $C_3 = \{q_5\}$
$C_1 = \{q_2, q_3\}$, $C_2 = \{q_0, q_1, q_4\}$, $C_3 = \{q_5\}$
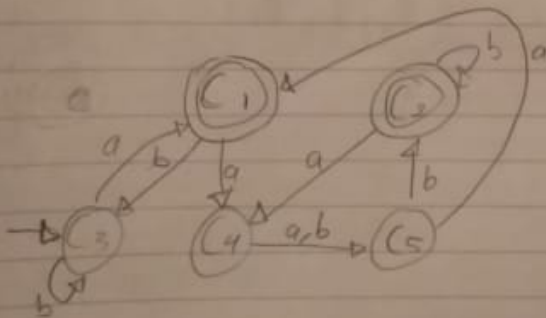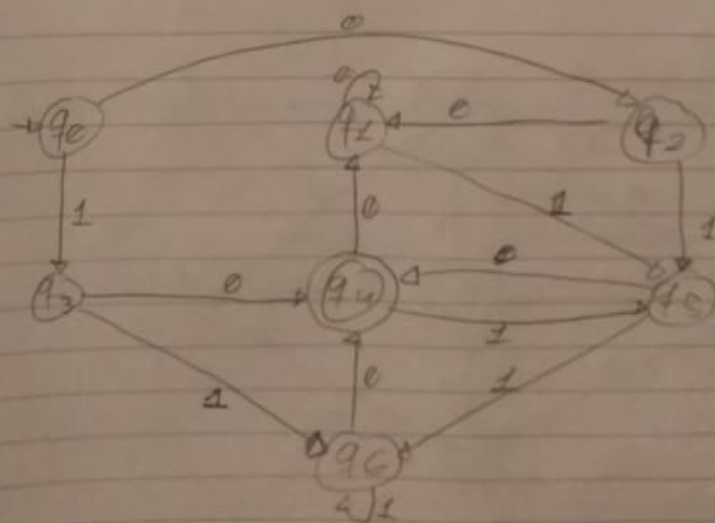

f)

$C_1 = \{q_1, q_3\}$, $C_2 = \{q_0, q_2, q_4, q_5\}$

C_1
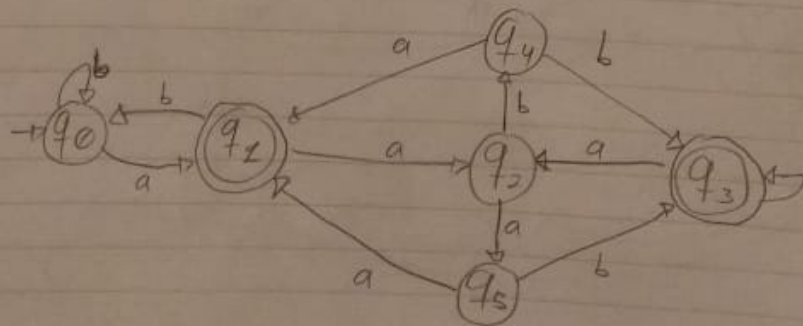
δ	a	b				
→q_1	q_2	q_e		2,2	4,3	C_1
×q_3	q_2	q_3		2,1	4,2	C_2

C_2

δ	a	b				
→q_0	q_1	q_0		1,2	1,3	C_3
q_2	q_5	q_4		2,2	5,5	C_4
q_4	q_1	q_3		1,1	1,2	C_5
q_5	q_1	q_3		1,1	1,2	C_5

$C_1 = \{q_4\}$ $C_2 = \{q_3\}$ $C_3 = \{q_0\}$ $C_4 = \{q_2\}$, $C_5 = \{q_1, q_5\}$
$C_1 = \{q_1\}$, $C_2 = \{q_3\}$, $C_3 = \{q_0\}$ $C_4 = \{q_2\}$ $C_5 = \{q_4, q_5\}$

g)

$C_1 = \{q_4\}$, $C_2 = \{q_0, q_1, q_2, q_3, q_5, q_6\}$

C_1

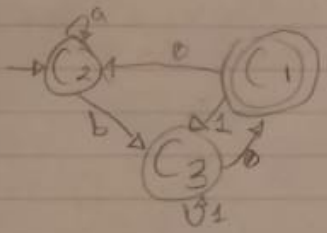| δ	e	1			
*q_4	q_1	q_5	2,2	2,3	C_1

C_2

δ	e	1			
q_0	q_2	q_3	2,2	3,3	C_2
q_1	q_4	q_5	2,2	3,3	C_2
q_2	q_1	q_5	2,2	2,3	C_2
q_3	q_4	q_6	1,2	1,3	C_3
q_5	q_4	q_6	1,2	1,3	C_3
q_6	q_4	q_6	1,2	1,3	C_3

*$C_1 = \{q_4\}$, $C_2 = \{q_0, q_1, q_2\}$, $C_3 = \{q_3, q_5, q_6\}$
$C_1 = \{q_4\}$, $C_2 = \{q_0, q_1, q_2\}$, $C_3 = \{q_3, q_5, q_6\}$

b)

$C_1 = \{ q_1, q_3 \}$, $C_2 = \{ q_0, q_2, q_4, q_5 \}$

C_1
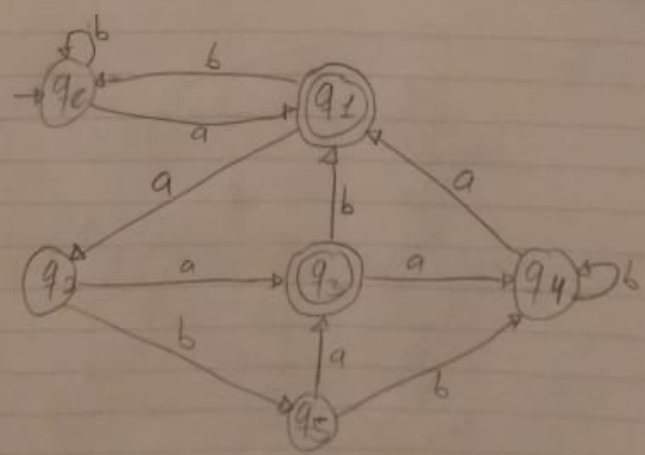
δ	a	b			
# q_1	q_2	q_0	2,2	3,3	
# q_3	q_4	q_1	3,1	4,1	

C_2

δ	a	b			
$\rightarrow q_0$	q_1	q_0	1,2	1,3	
q_2	q_3	q_5	1,2	2,3	
q_4	q_4	q_1	2,1	4,1	
q_5	q_3	q_4	1,2	2,4	

$C_1 = \{ q_1 \}$, $C_2 = \{ q_3 \}$, $C_3 = \{ q_0, q_2, q_5 \}$ $C_4 = \{ q_4 \}$

$C_1 = \{ q_1 \}$, $C_2 = \{ q_3 \}$, $C_3 = \{ q_0 \}$ $C_4 = \{ q_2 \}$, $C_5 = \{ q_4 \}$, $C_6 = \{ q_5 \}$

No tiene AFD mínimo

i)
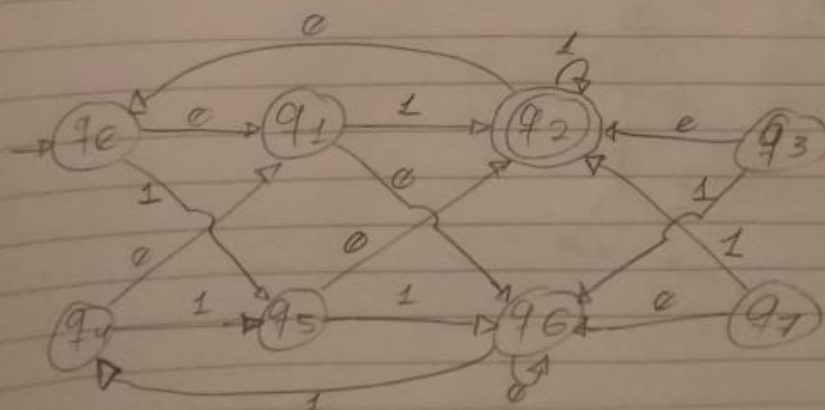
$C_1 = \{ q_2 \}, \quad C_2 = \{ q_0, q_1, q_3, q_4, q_5, q_6, q_7 \}$

C_1

δ	e	1				
$* q_2$	q_0	q_2	$2,1$	$2,1$	$2,1$	C_1

C_2

δ	e	1				
$\rightarrow q_0$	q_1	q_5	$2,2$	$1,4$	$3,4$	C_2
q_1	q_0	q_2	$2,1$	$5,1$	$6,1$	C_3
q_3	q_2	q_6	$1,2$	$1,5$	$1,6$	C_4
q_4	q_1	q_5	$2,2$	$3,4$	$3,4$	C_5
q_5	q_2	q_6	$1,2$	$1,5$	$1,6$	C_4
q_6	q_6	q_4	$3,2$	$5,5$	$6,5$	C_6
q_7	q_6	q_2	$2,1$	$5,1$	$6,1$	C_3

$C_1 = \{ q_2 \}, \; C_2 = \{ q_0 \}, \; C_3 = \{ q_1, q_7 \} \; C_4 = \{ q_3, q_5 \} \; C_5 = \{ q_4, q_6 \}$

$C_1 = \{ q_2 \} \; C_2 = \{ q_0 \} \; C_3 = \{ q_1, q_7 \} \; C_4 = \{ q_3, q_5 \} \; C_5 = \{ q_4 \} \; C_6 = \{ q_6 \}$

$C_1 = \{ q_2 \} \; C_2 = \{ q_0 \}, \; C_3 = \{ q_1, q_7 \} \; C_4 = \{ q_3, q_5 \}, \; C_5 = \{ q_4 \} \; C_6 = \{ q_6 \}$