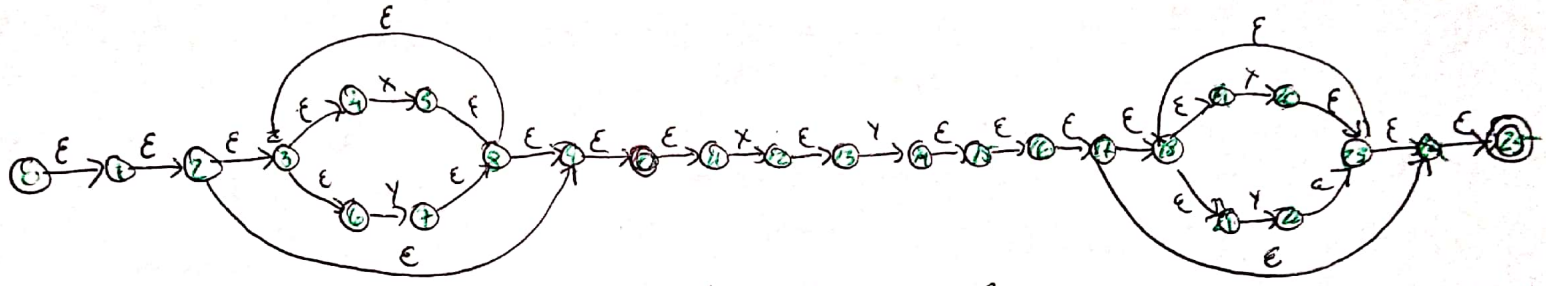
3.- $(x+y)^* xy (x+y)^*$

a) AFN-ε

N =



b)

$\varepsilon(q_0) = \{q_0, q_1, q_2, q_3, q_4, q_6, q_9, q_{10}, q_{14}\}$

$\varepsilon(q_1) = \{q_1, q_2, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\varepsilon(q_2) = \{q_2, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\varepsilon(q_3) = \{q_3, q_4\}$

$\varepsilon(q_4) = \{q_4\}$

$\varepsilon(q_5) = \{q_5, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\varepsilon(q_6) = \{q_6\}$

$\varepsilon(q_7) = \{q_7, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\varepsilon(q_8) = \{q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\varepsilon(q_9) = \{q_9, q_{10}, q_{11}\}$

$\varepsilon(q_{10}) = \{q_{10}, q_{11}\}$

$\varepsilon(q_{11}) = \{q_{11}\}$

$\varepsilon(q_{12}) = \{q_{12}, q_{13}\}$

$\varepsilon(q_{13}) = \{q_{13}\}$

$\varepsilon(q_{14}) = \{q_{14}, q_{15}, q_{16}, q_{17}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{15}) = \{q_{15}, q_{16}, q_{17}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{16}) = \{q_{14}, q_{17}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{17}) = \{q_{17}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{18}) = \{q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{19}) = \{q_{19}\}$

$\varepsilon(q_{20}) = \{q_{20}, q_{23}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{21}) = \{q_{21}\}$

$\varepsilon(q_{22}) = \{q_{22}, q_{23}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{23}) = \{q_{23}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\varepsilon(q_{24}) = \{q_{24}, q_{25}\}$

$\varepsilon(q_{25}) = \{q_{25}\}$

Escaneado con CamScanner

b)

$\delta_M(q_0,x) = \{q_5, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\} \{q_{12}, q_{13}\}$

$\delta_M(q_1,x) = \{q_5, q_8, q_3, q_4, q_6, q_9, q_{10}, q_4, q_{12}, q_{13}\}$

$\delta_M(q_2,x) = \{q_5, q_8, q_3, q_4, q_6, q_4, q_{10}, q_{11}, q_{12}, q_{13}\}$

$\delta_M(q_3,x) = \delta(q_2,x)$

$\delta_M(q_4,x) = \delta(q_2,x)$

$\delta_M(q_5,x) = \delta(q_2,x)$

$\delta_M(q_6,x) = \emptyset$

$\delta_M(q_7,x) = \delta(q_2,x)$

$\delta_M(q_8,x) = \delta(q_2,x)$

$\delta_M(q_9,x) = \{q_{12}, q_{13}\}$

$\delta_M(q_{10},x) = \{q_{12}, q_{13}\}$

$\delta_M(q_{11},x) = \{q_{12}, q_{13}\}$

$\delta_M(q_{12},x) = \emptyset$

$\delta_M(q_{13},x) = \emptyset$

$\delta_M(q_{14},x) = \{q_{20}, q_{23}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\delta_M(q_{15},x) = \delta_M(q_{14},x)$

$\delta_M(q_{16},x) = \delta_M(q_{14},x)$

$\delta_M(q_{17},x) = \delta_M(q_{14},x)$

$\delta_M(q_{18},x) = \delta_M(q_{14},x)$

$\delta_M(q_{19},x) = \delta_M(q_{14},x)$

$\delta_M(q_{20},x) = \delta_M(q_{14},x)$

$\delta_M(q_{21},x) = \emptyset$

$\delta_M(q_{22},x) = \delta_M(q_{14},x)$

$\delta_M(q_{23},x) = \delta_M(q_{14},x)$

$\delta_M(q_{24},x) = \emptyset$

$\delta_M(q_{25},x) = \emptyset$

$\delta_M(q_0,y) = \{q_7, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\delta_M(q_{11},y) = \{q_7, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\delta_M(q_2,y) = \{q_7, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\delta_M(q_3,y) = \delta_M(q_2,y)$

$\delta_M(q_4,y) = \emptyset$

$\delta_M(q_5,y) = \{q_7, q_8, q_3, q_4, q_6, q_9, q_{10}, q_{11}\}$

$\delta_M(q_6,y) = \delta(q_5,y)$

$\delta_M(q_7,y) = \delta(q_5,y)$

$\delta_M(q_8,y) = \delta(q_5,y)$

$\delta_M(q_9,y) = \emptyset$

$\delta_M(q_{10},y) = \emptyset$

$\delta_M(q_{11},y) = \emptyset$

$\delta_M(q_{12},y) = \{q_{14}, q_{15}, q_{16}, q_{17}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\delta_M(q_{13},y) = \delta_M(q_{12},y)$

$\delta_M(q_{14},y) = \{q_{22}, q_{23}, q_{18}, q_{19}, q_{21}, q_{24}, q_{25}\}$

$\delta_M(q_{15},y) = \delta_M(q_{14},y)$

$\delta_M(q_{16},y) = \delta_M(q_{14},y)$

$\delta_M(q_{17},y) = \delta_M(q_{14},y)$

$\delta_M(q_{18},y) = \delta_M(q_{14},y)$

$\delta_M(q_{19},y) = \emptyset$

$\delta_M(q_{20},y) = \delta_M(q_{14},y)$

$\delta_M(q_{21},y) = \delta_M(q_{14},y)$

$\delta_M(q_{22},y) = \delta_M(q_{14},y)$

$\delta_M(q_{23},y) = \delta_M(q_{14},y)$

$\delta_M(q_{24},y) = \emptyset$

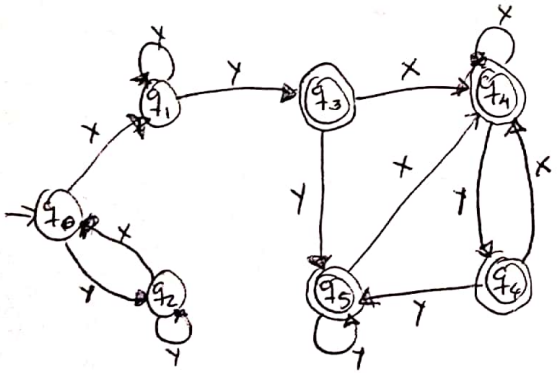
$\delta_M(q_{25},y) = \emptyset$

Escaneado con CamScanner

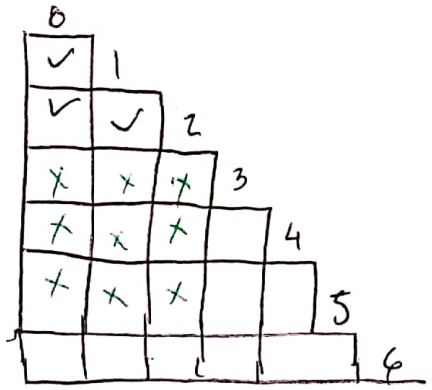
c)

	0	X	Y
→ q_0	0	$\{q_5,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13}\}^1$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11}\}^2$
$\{q_5,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13}\}$	1	$\{q_5,q_8,q_{13},q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13}\}^1$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{14},q_{15},q_{17},q_{18},q_{19},q_{21},q_{24},q_{25}\}^3$
$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11}\}^2$	2	$\{q_5,q_8,q_{13},q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13}\}^1$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11}\}^2$
$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{14},q_{15},q_{17},q_{18},q_{19},q_{21},q_{24},q_{25}\}$ 3 F	3	$\{q_5,q_8,q_{13},q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13},q_{20},q_{25},q_{18},q_{19},q_{21},q_{24},q_{26}\}^4$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{22},q_{25},q_{18},q_{19},q_{21},q_{24},q_{26}\}^5$
$\{q_5,q_8,q_{13},q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13},q_{20},q_{25},q_{18},q_{19},q_{21},q_{24},q_{26}\}$ 4 F	4	$\{q_5,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13},q_{20},q_{25},q_{18},q_{19},q_{21},q_{24},q_{26}\}^4$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{14},q_{15},q_{16},q_{17},q_{18},q_{19},q_{21},q_{24},q_{25},q_{22}\}^6$
$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{22},q_{25},q_{18},q_{19},q_{21},q_{24},q_{26}\}$ F 5	5	$\{q_5,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13},q_{20},q_{25},q_{18},q_{19},q_{21},q_{24}\}^4$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{22},q_{25},q_{18},q_{19},q_{21},q_{24},q_{26}\}^5$
$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{14},q_{15},q_{16},q_{17},q_{18},q_{19},q_{21},q_{25},q_{22}\}$ F 6	6	$\{q_5,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{12},q_{13},q_{20},q_{25},q_{18},q_{19},q_{24}\}^4$	$\{q_7,q_8,q_3,q_4,q_6,q_9,q_{10},q_{11},q_{22},q_{25},q_{18},q_{19},q_{21},q_{24}\}^5$

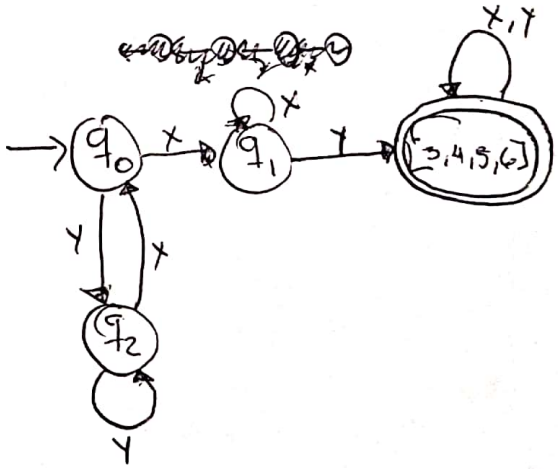
AFD



d)



$\Rightarrow 3 \simeq 4 \simeq 5 \simeq 6$



Escaneado con CamScanner