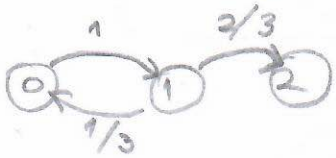
HOMEWORK 14 : JUAN PABLO ROYO SAES.

14.1

$$Q = \begin{bmatrix} -2 & 2 & 0 \\ 1 & -3 & 2 \\ 0 & 0 & 0 \end{bmatrix} \Rightarrow EMC = \begin{bmatrix} 0 & 1 & 0 \\ 1/3 & 0 & 2/3 \\ 0 & 0 & 0 \end{bmatrix}$$




$$m_{02} = \frac{1}{2} + 1\, m_{12}$$

$$m_{12} = \frac{1}{3} + \frac{1}{3} m_{02} \Rightarrow m_{12} = \frac{1}{3} + \frac{1}{3}\left(\frac{1}{2} + m_{12}\right)$$

$$= \frac{1}{3} + \frac{1}{6} + \frac{1}{3} m_{12}$$

$$= \frac{1}{2} + \frac{1}{3} m_{12}$$

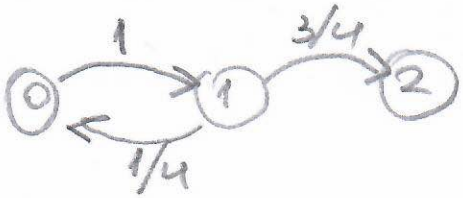
$$= \frac{1/2}{1 - 1/3}$$

$$\boxed{m_{12} = \frac{3}{4}}$$

$$\boxed{m_{02} = \frac{5}{4}}$$

14.2

$$Q = \begin{bmatrix} -1 & 1 & 0 \\ 1/4 & -1 & 3/4 \\ 0 & 0 & 0 \end{bmatrix} \Rightarrow EMC = \begin{bmatrix} 0 & 1 & 0 \\ 1/4 & 0 & 3/4 \\ 0 & 0 & 0 \end{bmatrix}$$



$$m_{02} = 1 + m_{12}$$

$$m_{12} = 1 + \frac{1}{4} m_{02} \Longrightarrow m_{12} = 1 + \frac{1}{4}(1 + m_{12})$$

$$= 1 + \frac{1}{4} + \frac{1}{4} m_{12}$$

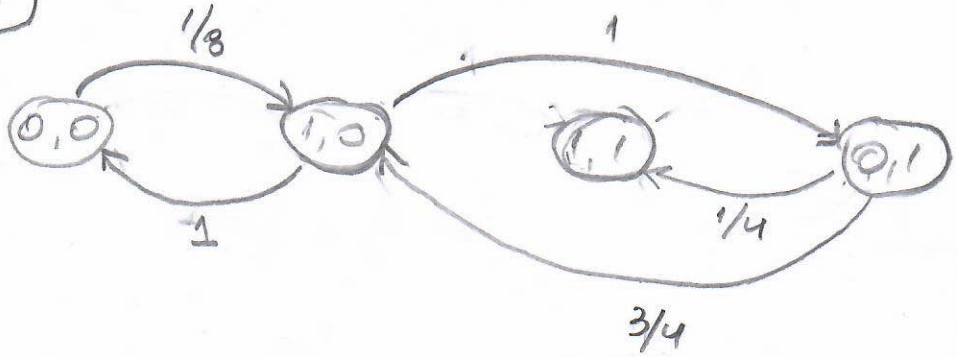
$$= \frac{5}{4} + \frac{1}{4} m_{12}$$

$$\boxed{m_{02} = \frac{8}{3}}$$

$$m_{12} = \frac{5/4}{1 - 1/4} = \boxed{\frac{5}{3}}$$

14.3

14.3.A

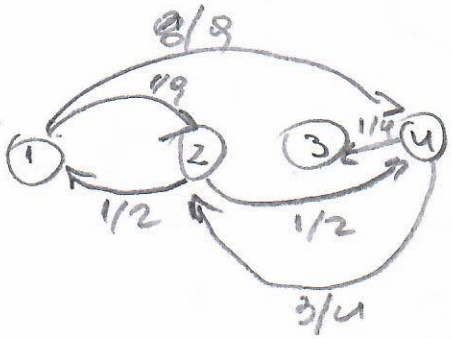



$Q =$

| | 00 | 10 | 11 | 01 |
|---|---|---|---|---|
| 00 | -9/8 | 1/8 | 0 | 1 |
| 10 | 1 | -2 | 0 | 1 |
| 11 | 0 | 0 | 0 | 0 |
| 01 | 0 | 3/4 | 1/4 | -1 |

EMC =

| | 1 00 | 2 10 | 3 11 | 4 01 |
|---|---|---|---|---|
| 1) 00 | 0 | 1/9 | 0 | 8/9 |
| 2) 10 | 1/2 | 0 | 0 | 1/2 |
| 3) 11 | 0 | 0 | 0 | 0 |
| 4) 01 | 0 | 3/4 | 1/4 | 0 |



14.3 B

$f^{e}_{43} = \boxed{\frac{1}{4}}$

14 3 C

$f(\infty)(11) - f(\infty)(01) = f_{13}\ f_{14}$

$f_{13} = \frac{1}{9} f_{23} + \frac{8}{9} f_{43} \Rightarrow f_{13} = \frac{1}{9} f_{23} + \frac{2}{9} \Rightarrow \boxed{F_{13} = \frac{1}{4}}$

$f_{23} = \frac{1}{2} f_{43} + \frac{1}{2} f_{13} \Rightarrow f_{23} = \frac{1}{8} + \frac{1}{2} f_{13} \Rightarrow f_{23} = \frac{1}{8} + \frac{1}{18} f_{23} + \frac{1}{9}$

$\boxed{f_{43} = \frac{1}{4}}$

$f_{23} = \frac{17/72}{1 - 1/18}$

$\boxed{F_{23} = \frac{1}{4}}$

$f_{14} = \frac{8}{9} + \frac{1}{9} f_{24}$

$f_{24} = \frac{1}{2} + \frac{1}{2} f_{14}$

$\Rightarrow f_{14} = \frac{8}{9} + \frac{1}{18} + \frac{1}{18} f_{14}$

$f_{14} = \frac{\frac{17}{18}}{1 - \frac{1}{18}}$

$\boxed{f_{14} = 1.}$

$f_{13}\ f_{14} = \boxed{\frac{1}{4}}$