$$(D-4)^2 y = -8e^{4x}$$

$(m-4)^2 = 0 \quad m_1 = m_2 = 4 \quad$ Tipo II.

$$y = c_1 e^{4x} + c_2 x e^{4x}$$

$$Q = -8e^{4x}$$

$$\begin{bmatrix} e^{4x} & xe^{4x} \\ 4e^{4x} & 4xe^{4x} + e^{4x} \end{bmatrix} \begin{bmatrix} A' \\ B' \end{bmatrix} = \begin{bmatrix} 0 \\ -8e^{4x} \end{bmatrix}$$

$$A' = \frac{\begin{vmatrix} 0 & xe^{4x} \\ -8e^{4x} & 4xe^{4x} + e^{4x} \end{vmatrix}}{e^{4x}(4xe^{4x} + e^{4x}) - 4e^{4x} xe^{4x}}$$

$$A' = \frac{8xe^{4x}e^{4x}}{4xe^{4x}e^{4x} + e^{4x}e^{4x} - 4xe^{4x}e^{4x}}$$

$$A' = \frac{8xe^{4x}e^{4x}}{e^{4x}e^{4x}} = 8x$$

$$B' = \frac{\begin{vmatrix} e^{4x} & 0 \\ 4e^{4x} & -8e^{4x} \end{vmatrix}}{e^{4x}e^{4x}} \Rightarrow \frac{-8e^{4x}e^{4x}}{e^{4x}e^{4x}} = -8$$

$$A = 8\int x\,dx \Rightarrow 4x^2 + c_1$$

$$B = -8\int dx \Rightarrow -8x + c_2$$

$$y = (4x^2 + c_1)e^{4x} + (-8x + c_2)xe^{4x}$$

$$\boxed{y = c_1 e^{4x} + c_2 x e^{4x} - 4x^2 e^{4x}}$$

Cap. 3.- Sistemas de E.DOL.

$$\frac{dx_1(t)}{dt} = a_{11}\cdot x_1(t) + a_{12}\cdot x_2(t)$$

$$\frac{dx_2(t)}{dt} = a_{21}\cdot x_1(t) + a_{22}\cdot x_2(t)$$

$$S(2)\,\underline{EDO(1)\,L\,cc}.\ H.$$

$$\frac{d}{dt}\begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \times \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix}$$

$$\frac{d}{dt}\bar{x}(t) = A \times \bar{X}(t) \qquad \bar{x}(0)$$

<u>Sol.</u> $$\bar{x}(t) = \left[e^{At}\right] \times \bar{x}(0)$$

$$\frac{dx}{dt} = 2x + 3y \qquad x(0) = 5 \qquad \begin{bmatrix} x(t) \\ y(t) \end{bmatrix}$$

$$\frac{dy}{dt} = x + 4y \qquad y(0) = -8$$

$$x = \frac{dy}{dt} - 4y$$

$$\frac{d}{dt}: \quad \frac{dx}{dt} = \frac{d^2y}{dt^2} - 4\frac{dy}{dt}$$

$x(t) = \_C1\, e^{5t} + \_C2\, e^{t}$

$y(t) = \_C1\, e^{5t} - \frac{1}{3}\_C2\, e^{t}$

$$\left[\frac{d^2y}{dt^2} - 4\frac{dy}{dt}\right] = 2\left[\frac{dy}{dt} - 4y\right] + 3y$$

$$\frac{d^2y}{dt^2} - 6\frac{dy}{dt} + 5y = 0 \qquad \text{EDO(2)L c c H}$$

$$S(n)\,\text{EDO(1)L} \iff \text{EDO}(n)\text{L}$$

$$m^2 - 6m + 5 = 0 \qquad (m-1)(m-5) = 0$$

$$\boxed{y(t) = C_1 e^{t} + C_2 e^{5t}}$$

$$\frac{dy}{dt} = C_1 e^{t} + 5C_2 e^{5t}$$

$$x(t) = \left(C_1 e^{t} + 5C_2 e^{5t}\right) - 4\left(C_1 e^{t} + C_2 e^{5t}\right)$$

$$\boxed{x(t) = -3C_1 e^{t} + C_2 e^{5t}}$$