$$\begin{bmatrix} \frac{dx_1}{dt} \\ \frac{dx_2}{dt} \\ \frac{dx_3}{dt} \\ \vdots \\ \frac{dx_{n-1}}{dt} \\ \frac{dx_n}{dt} \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 & 0 & \cdots & 0 \\ 0 & 0 & 1 & 0 & \cdots & 0 \\ 0 & 0 & 0 & 1 & \cdots & 0 \\ & & & & & \\ 0 & 0 & 0 & 0 & \cdots & 1 \\ -\frac{a_0}{a_n} & -\frac{a_1}{a_n} & -\frac{a_2}{a_n} & \cdots & & -\frac{a_{n-1}}{a_n} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_{n-1} \\ x_{n-2} \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 0 \\ \vdots \\ 0 \\ \frac{1}{a_n} \end{bmatrix} u(t)$$

$[n \times 1]$ $[n \times n]$ $[n \times 1]$ $[n \times 1]$

$$\dot{x} = [A][x] + [B]u$$

sistem pers. diff orde pertama

$$\frac{d^2x(t)}{dt^2} + \mu\left[[x(t)]^2 - 1\right]\left(\frac{dx(t)}{dt}\right) + x(t) = 0$$

$$x(t) = x_1 \longrightarrow \frac{dx(t)}{dt} = \frac{dx_1}{dt} = x_2$$

$$\frac{dx(t)}{dt} = x_2 \longrightarrow \frac{d^2x(t)}{dt^2} = \frac{dx_2}{dt} = -x_1 - \mu\left(x_1^2 - 1\right)x_2$$

Satu persamaan differensial orde kedua dipecah menjadi 2(dua) buah persamaan differensial orde pertama :

(1) $\frac{dx_1}{dt} = x_2$

(2) $\frac{dx_2}{dt} = -x_1 - \mu\left(x_1^2 - 1\right)x_2$