

LAMP: ADICIA INICIA INICIA

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Mechatronics

1) A dynamic equation can be referred to as a difference equation in discrete time differential equation in continuous time and time scale calculus in combined discrete and continuous time.

$$2) y = Ate^t$$

$$\therefore u = At, \quad \frac{dy}{dt} = A, \quad v = e^t, \quad \frac{dv}{dt} = e^t$$

$$\frac{dy}{dt} = u \frac{dy}{du} + v \frac{dy}{dv}$$

$$\frac{dy}{dt} = Ae^t + Ate^t$$

$$\frac{dy}{dt} = A(e^t + te^t) \quad \therefore y = Ate^t$$

$$A = y$$

Input equ 2 in 3

$$\frac{dy}{dt} = y \left(\frac{1}{t} + te^t \right)$$

$$\frac{dy}{dt} = y \left(\frac{1}{t} + 1 \right)$$

$$\therefore \frac{dy}{dt} = y \left(1 + \frac{1}{t} \right)$$