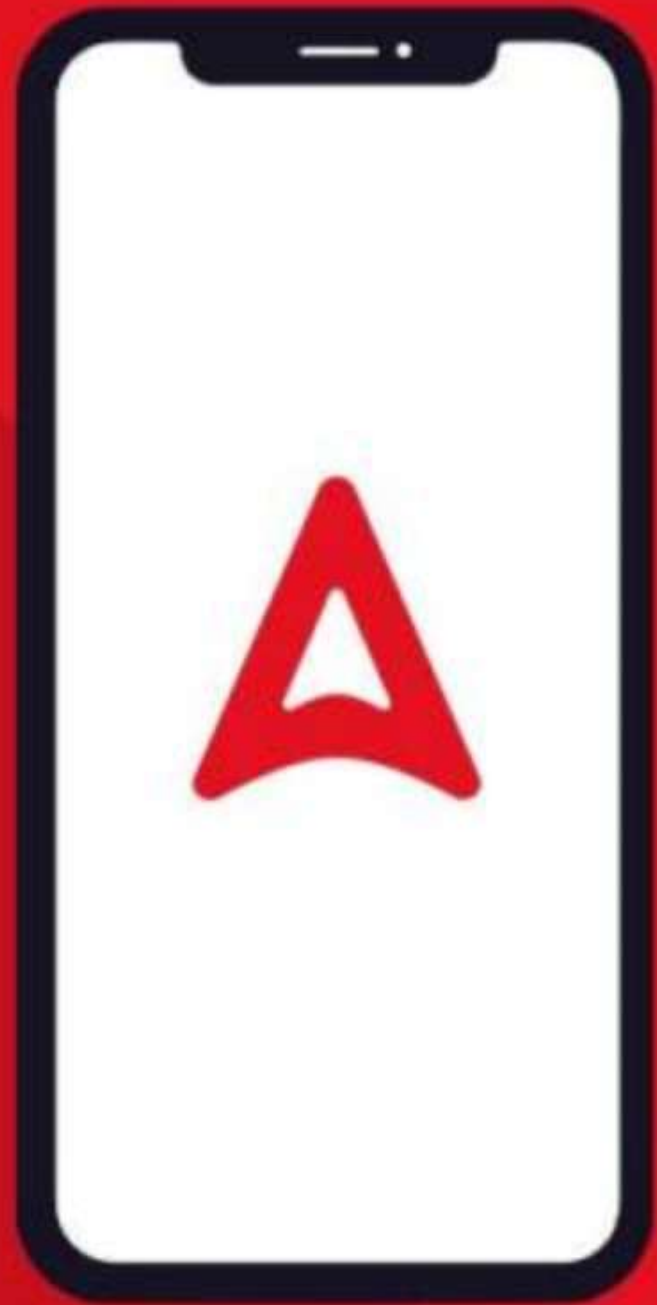


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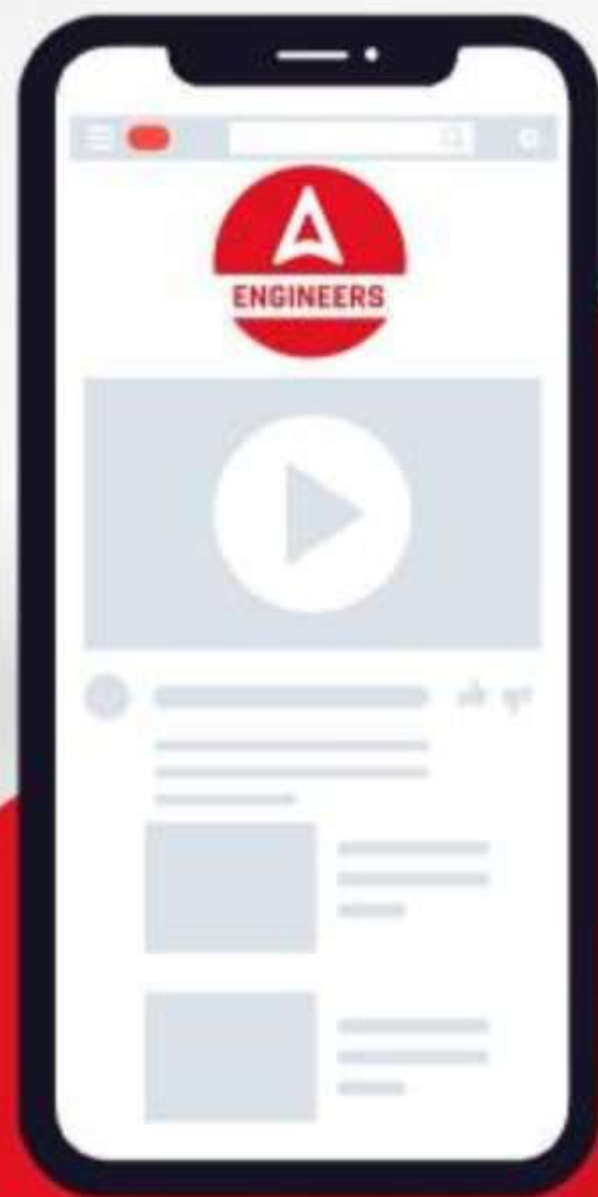
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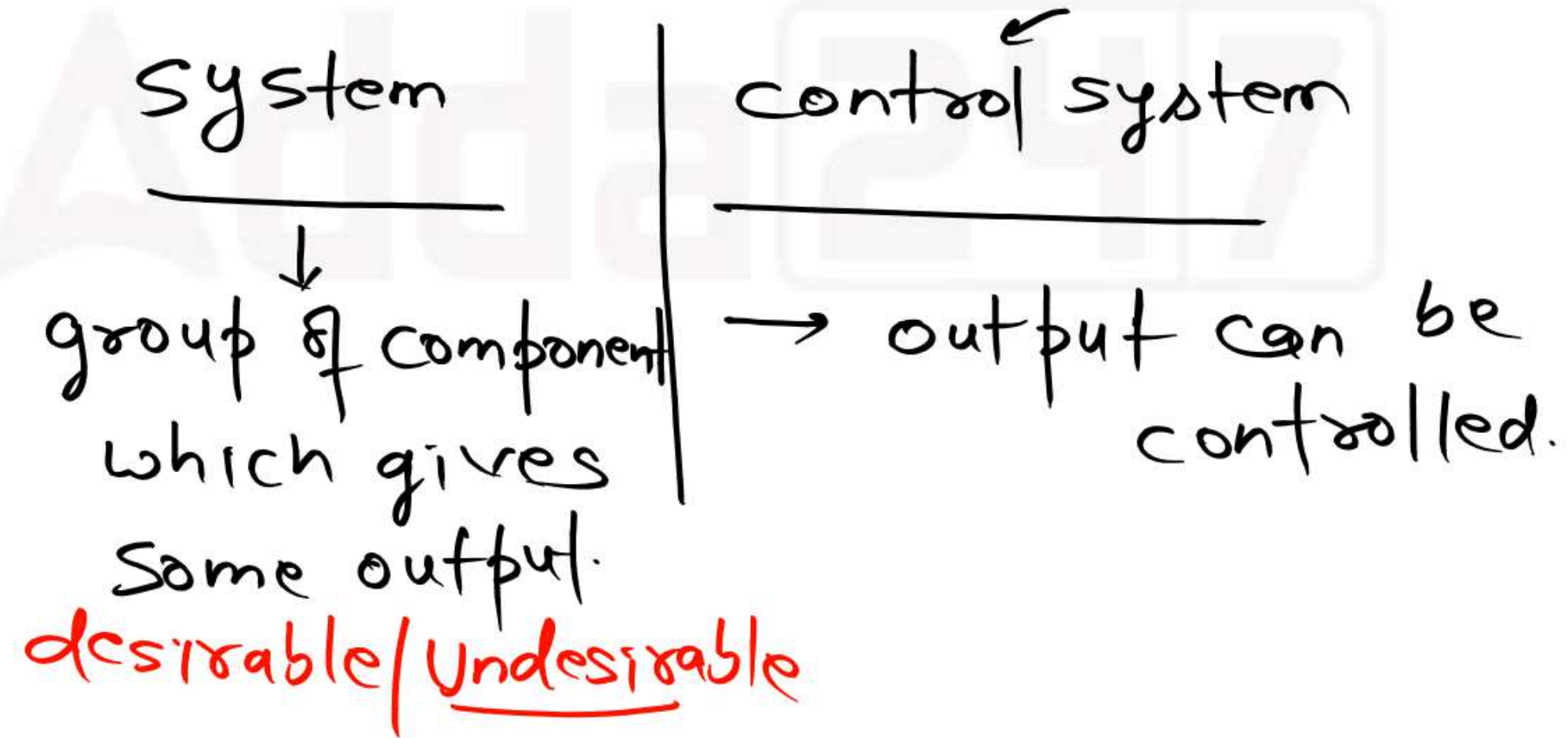
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BASICS OF CONTROL SYSTEM

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BASICS OF CONTROL SYSTEM

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Systems	Control system.
→ Fan without regulator and blades	→ No off
	→ Neither system Nor control system.
→ Fan without regulator with blades	→ <u>system</u>

BASICS OF CONTROL SYSTEM

Fan with regulator
and with blades → control system

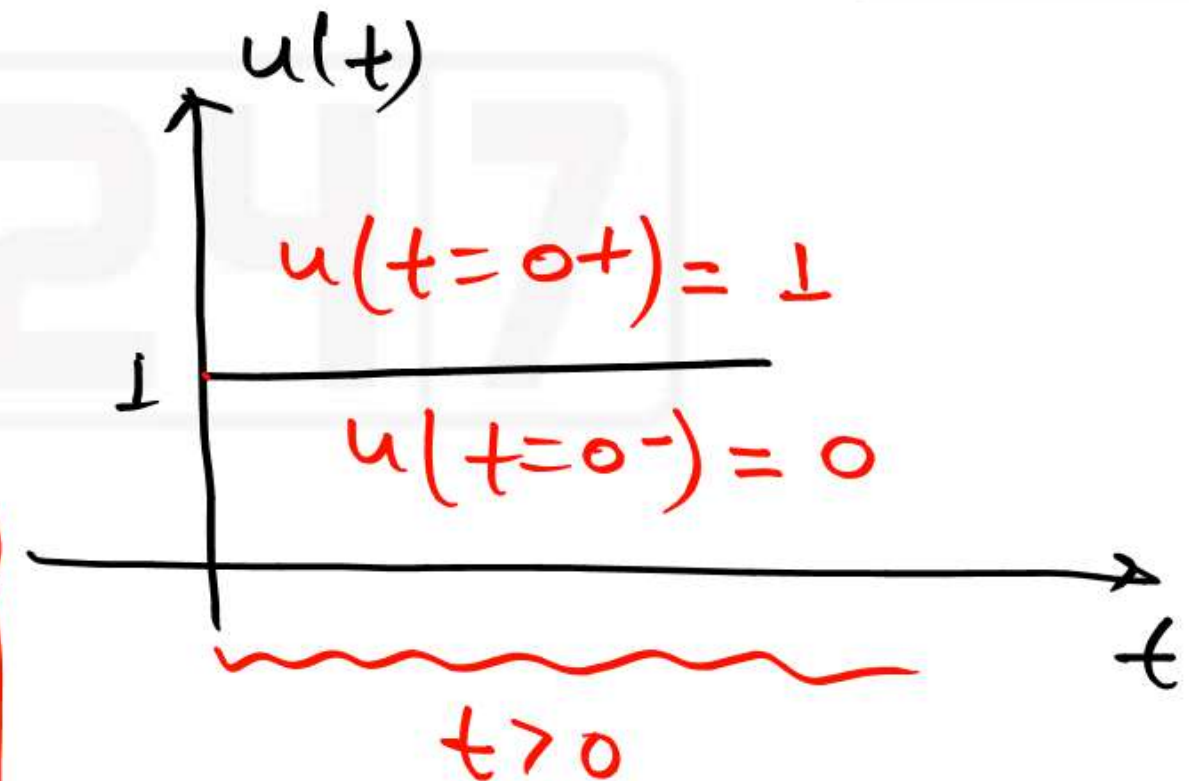
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BASICS OF CONTROL SYSTEM

Basic signals

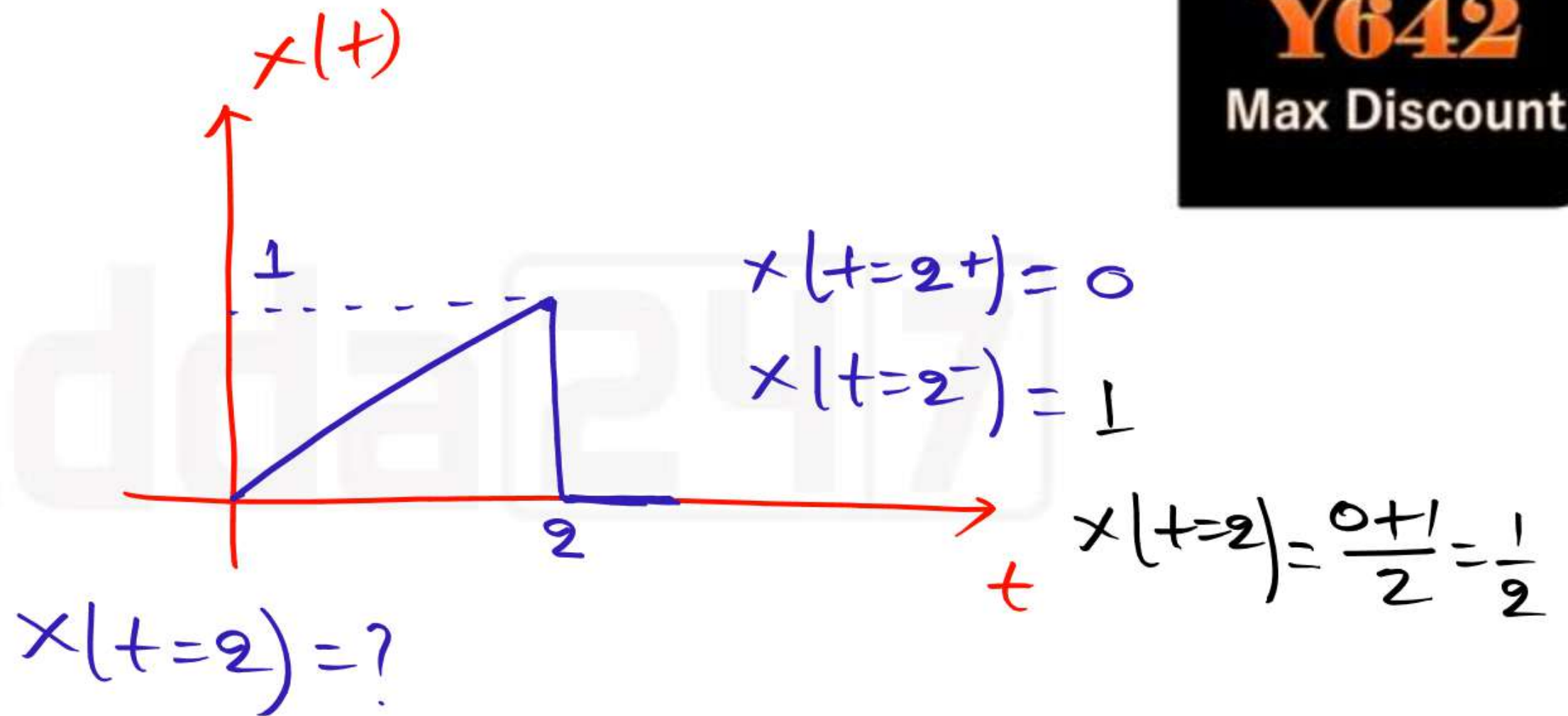
1. unit step signal

$$\left\{ \begin{array}{ll} u(t) = 1 & t > 0 \\ = 0 & t < 0 \\ = \frac{1}{2} & t = 0 \end{array} \right.$$



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Basic signal

$$u(t) \rightarrow \left. \begin{array}{ll} 1 & t > 0 \\ 0 & t < 0 \\ -\frac{1}{2} & t = 0 \end{array} \right\}$$

$$\boxed{L[u(t)] \rightarrow \frac{1}{s}}$$

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Basic signal

2. impulse signal

$$\left[\begin{array}{l} \delta(t) = \infty \quad \text{at } t=0 \\ \quad \quad \quad = 0 \quad \quad \quad t \neq 0 \end{array} \right]$$

∴ $L[\delta(t)] = 1$

$\delta(t)$

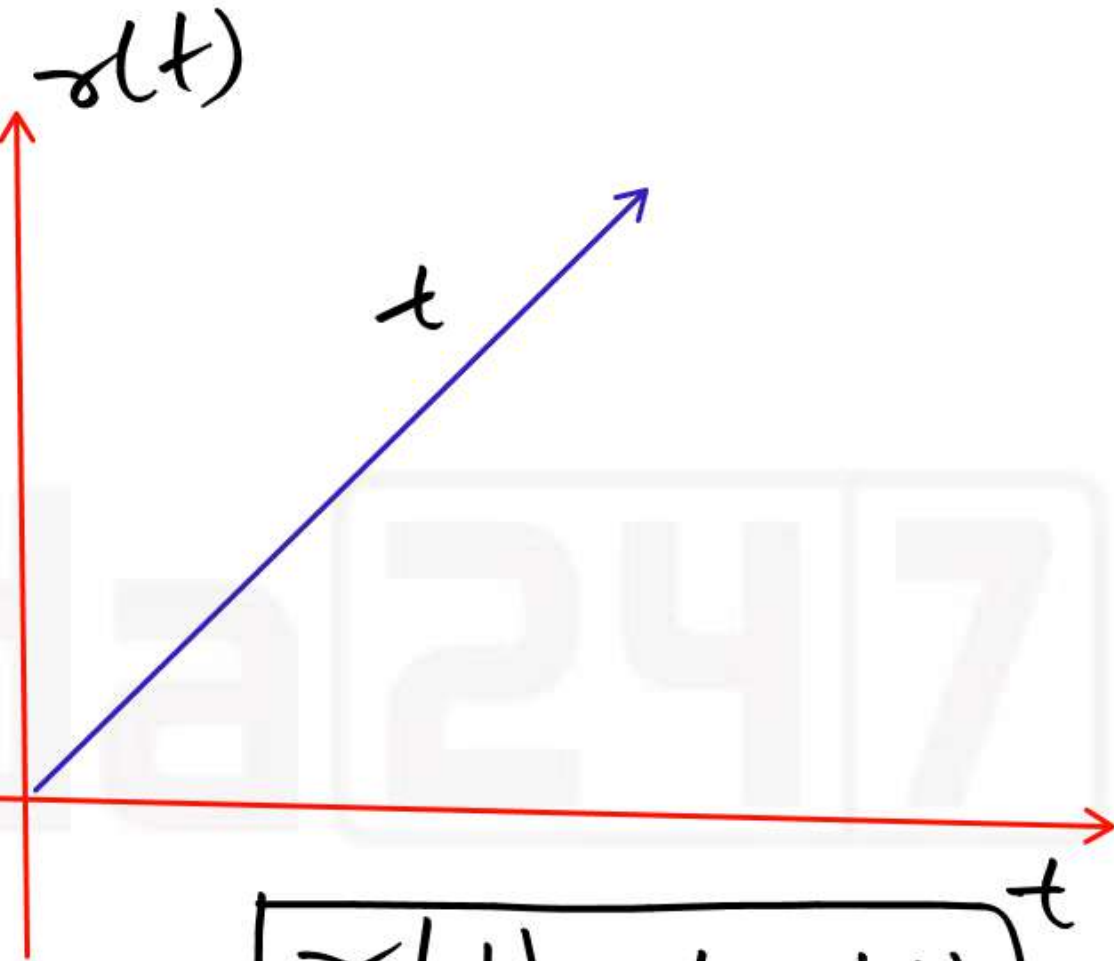


* Area of impulse = 1

$$\int \delta(t) dt = 1$$

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Ramp signal \rightarrow



$$x(t) = \begin{cases} t & t \geq 0 \\ 0 & t < 0 \end{cases}$$

$$L[x(t)] = \frac{1}{s^2}$$

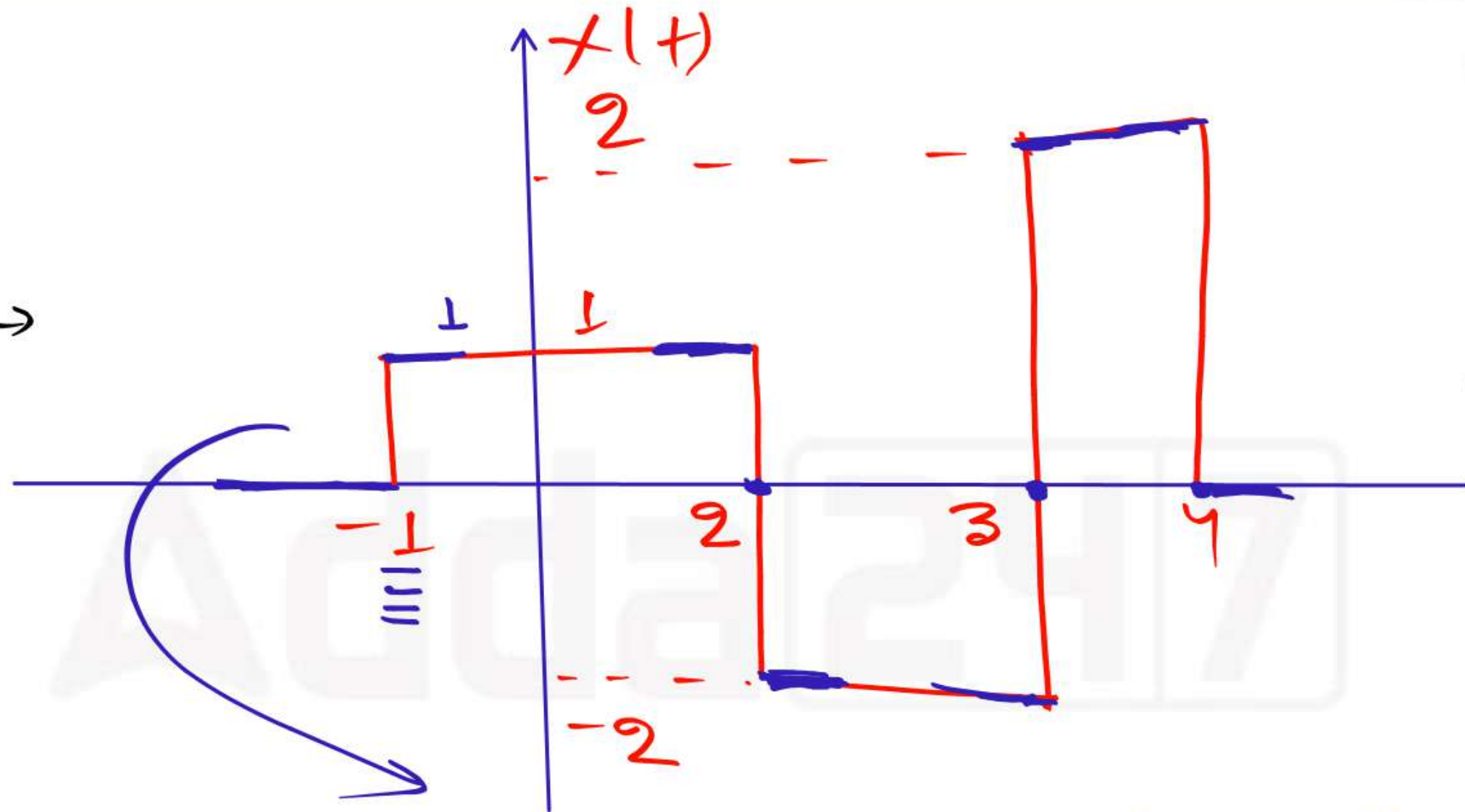
$$x(t) = t \cdot u(t)$$

$$= \begin{cases} t & t \geq 0 \\ 0 & t < 0 \end{cases}$$

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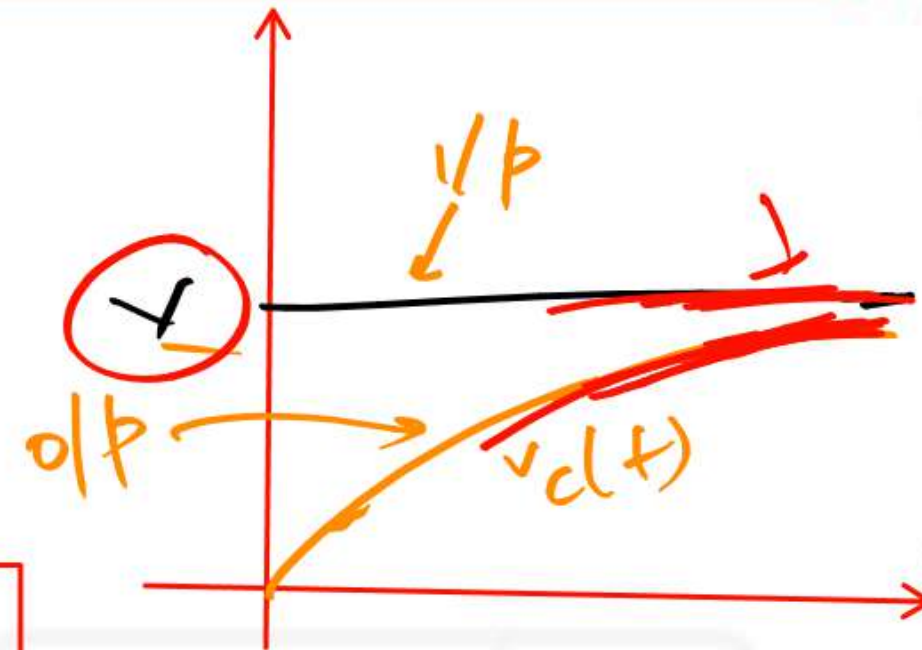
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eg: →

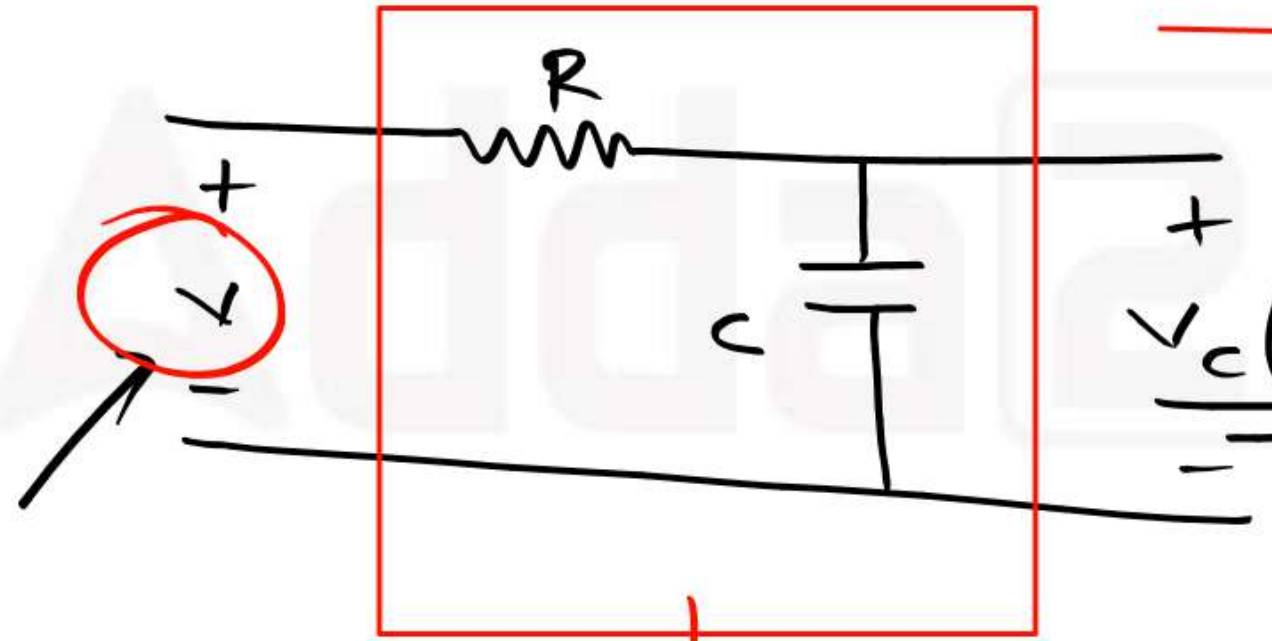


$$(1-0)u(t+1) + \underline{(-2-1)}u(t-2) + (2-(-2))u(t-3) + (4-2)u(t-4)$$

Control system



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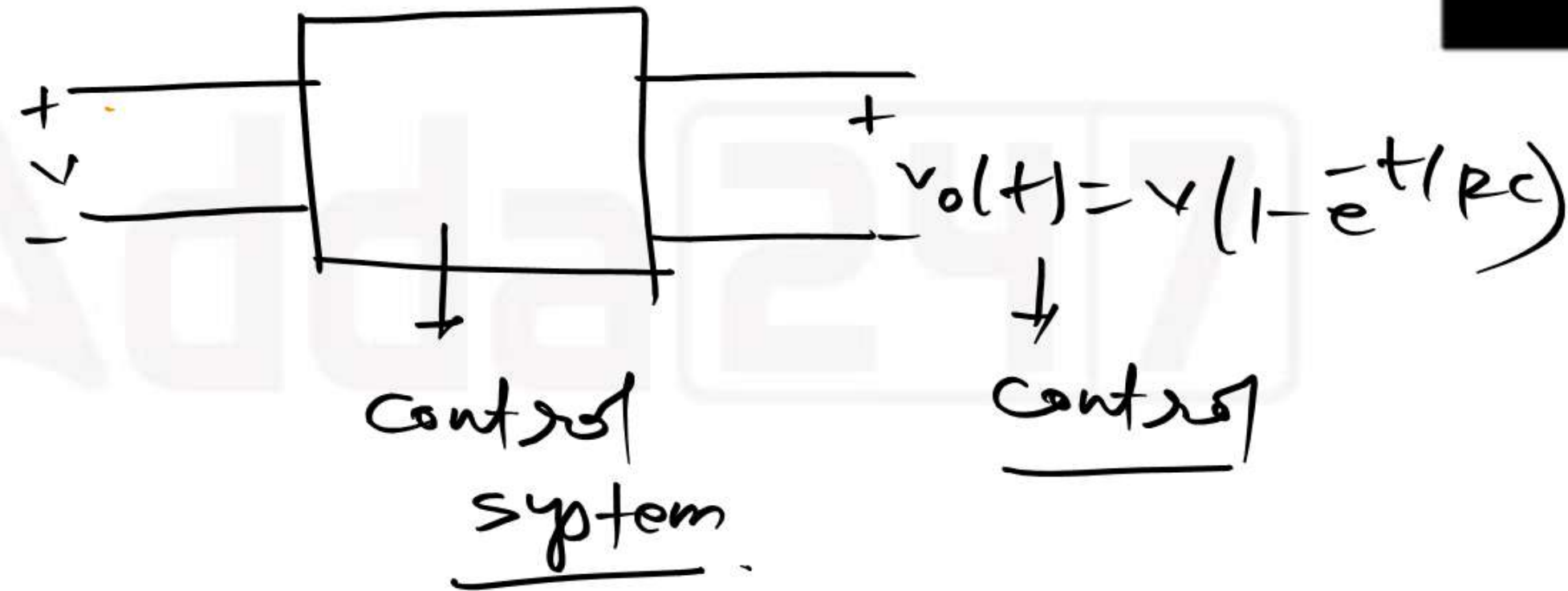
$$v_c(t) = V \left[1 - e^{-t/RC} \right]$$

$$t = 0, v_c(t) = 0$$

$$t = RC, v_c(t) = V \times 0.632$$

Control system

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