$$(5+1) Y(5) = X(5)$$

$$H(s) = \frac{Y(s)}{x(s)} = \frac{1}{S+1}$$

$$\frac{1}{5(5+1)} = \frac{A}{5} + \frac{B}{5+1} \cdot \frac{1}{1} \cdot \frac{1}{1}$$

$$As + Bs + A = 1$$

$$\frac{1}{5} \cdot \frac{1}{5+1} = \frac{1}{5^2+5} = Y(5)$$

$$Y(t) = \int_{-\infty}^{\infty} \frac{1}{s^2 + s} e^{st} ds$$

$$y(t) = (1 - e^{-t}) u(t)$$

$$Y(s) = \int_{0}^{\infty} (1 - e^{-t})e^{-st} dt$$

= $\int_{e}^{\infty} - e^{-t} e^{-st} dt$

$$\frac{-1}{5}e^{-5t} + \frac{1}{1+5}e^{-(-1-5)+100} = -1\left(\frac{-1}{5} + \frac{1}{1+5}\right)$$

$$\frac{1}{5} - \frac{1}{1+5} \ge \boxed{\frac{1}{5(5+1)}}$$

2.A.
$$\lim_{s\to 0} 5X(s) = x(\infty)$$
 fixt. $\frac{Y}{Y_{so}} = \frac{kH}{11kH}$

$$\frac{Y}{Y_{sp}} = \frac{kH}{11kH}$$

$$K(Y_{Sp}-HX)=X$$

$$\frac{Y}{Y_{SP}} = \frac{K_{\overline{S}} H}{1 + \frac{K_{\overline{S}} H}{S} H}$$

$$\frac{Y}{V} = \frac{k_{I}}{\frac{S}{1+k_{I}}H} = \frac{k_{I}H}{\frac{S}{1+k_{I}H}} = \frac{k_{I}H}{\frac{S}{1+k_{I}H}}$$

$$\frac{Y}{Y_{SP}} = \frac{K_{I}H}{S + K_{I}H}$$

$$\frac{\frac{Y}{Y_{SP}} = \frac{K_{I}H}{S+K_{I}H}}{\frac{|D_{C_{I}Gin}|}{|D_{C_{I}Gin}|}} = \lim_{S \to 0} \frac{k_{I}H}{S+k_{I}H} = 1$$

$$B. \frac{Y}{Y_{SP}} = \frac{k_{I}}{S+k_{I}} \frac{K_{I}}{S+k_{I}} \frac{S+k_{I}}{S+k_{I}} = \frac{k_{I}}{S+k_{I}} \frac{K_{I}}{S+k_{I}} = \frac{k_{I}}{T} \frac{k_{I}}{T} = \frac{k_{I}}{T} \frac{k_{I}}{S+k_{I}}$$

$$S = \frac{-1 \pm \sqrt{1 - 4\tau k_T}}{2\tau}$$























































