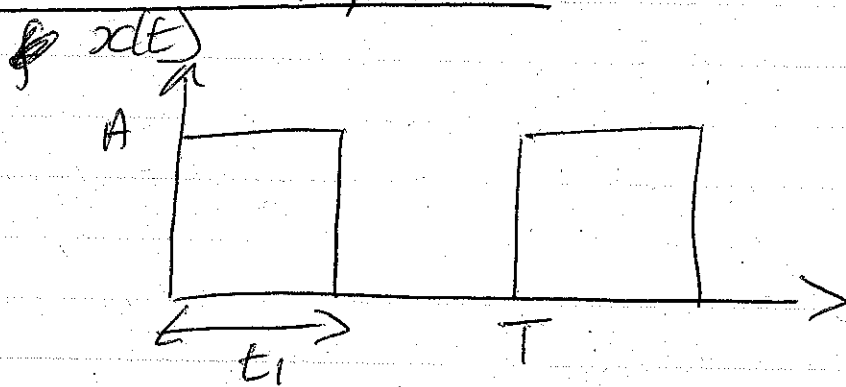


## Square Wave Response :



$$y(t) = g(t) \cdot x(t)$$

$$Y(s) = G(s) \cdot X(s)$$

$$G(s) = \frac{\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2}$$

$$X(s) = ?$$

Using the periodic function rule :

$x(t)$  = periodic function

$$\mathcal{L}\{x(t)\} = \frac{\int_0^T x(t) e^{-st} dt}{1 - e^{-sT}}$$

$$\int_0^T x(t) e^{-st} dt = \int_0^{t_1} A e^{-st} dt + \int_{t_1}^T 0 e^{-st} dt$$

$$x(t) = A$$
$$x(t) = 0$$

$$0 \leq t \leq t_1$$
$$t_1 \leq t \leq T$$