In this question we can write the force as $F(t) = \frac{F_0 t}{T}(U(t) - U(t-T)) + F_0 U(t-T) = \frac{F_0 t}{T} U(t) - \frac{F_0 (t-T)}{T} U(t-T)$, again we will solve using DSLT.

1. Our equation is

$$m\ddot{x}(t) + \gamma\dot{x}(t) + kx(t) = F(t)$$

by DSLT:

$$mS^2 X(S) + \gamma S X(S) + kX(S) = \frac{F_0}{T}\left(\frac{1}{S^2} - \frac{e^{-TS}}{S^2}\right)$$

Let's define $\alpha_1 = \frac{-\gamma+\sqrt{\gamma^2-4mk}}{2m}$ and $\alpha_2 = \frac{-\gamma-\sqrt{\gamma^2-4mk}}{2m}$
by algebraic manipulation:

$$X(S) = \frac{F_0}{T}\left[\frac{1}{(S-\alpha_1)(S-\alpha_2)}\left(\frac{1}{S^2} - \frac{e^{-TS}}{S^2}\right)\right]$$

let's define:$\hat{X}(S) = \frac{F_0}{T}\frac{1}{(S-\alpha_1)(S-\alpha_2)}\frac{1}{S^2}$
by inverse DSLT:

$$\hat{x}(t) = \frac{F_0 t}{Tk} - \frac{F_0\gamma}{Tk^2} + F_0\gamma e^{-\frac{\gamma t}{2m}} \cdot y(t)$$

where

$$y(t) = \frac{\cosh\left(\frac{t\sqrt{\frac{\gamma^2}{4}-km}}{m}\right) - m\sinh\left(\frac{t\sqrt{\frac{\gamma^2}{4}-km}}{m}\right)\left(\frac{\gamma}{2m} - \frac{F_0\gamma^2 - F_0 km}{F_0\gamma m}\right)}{\frac{\sqrt{\frac{\gamma^2}{4}-km}}{Tk^2}}$$

and we get

$$x(t) = \hat{x}(t)U(t) - \hat{x}(t-T)U(t-T)$$