1. Three identical masses $m$ are connected by two springs as shown:

\[ \begin{array}{c}
\text{A} \quad \text{B} \quad \text{C} \\
\text{m} \quad \text{m} \quad \text{m}
\end{array} \]

Here, $k$ is the spring constant and the motion is 1D.

At $t=0$, all masses are at rest at their equilibrium positions. The leftmost mass $A$ is then subjected to an external driving force:

\[ F(t) = f \cos(\omega t) , \quad t \geq 0 \]

Find the motion of mass $C$. 
Consider a 1D particle subject to force \( F = \begin{cases} 
0, & t < 0 \\
\frac{F_0 t}{\tau} \cos(\omega t), & 0 \leq t < \tau \\
F_0 \cos(\omega t), & t \geq \tau 
\end{cases} \)

Assuming that the particle is at rest at \( t < 0 \), calculate the subsequent motion of the particle (i.e., find \( x(t) \)).