# 1.

below

For the system shown in Fig. P8-1, determine the generalized physical properties m^*, c^*, k^*, and the generalized loading $p^*(t)$, all defined with respect to the displacement coordinate $Z(t)$. Express the results in terms of the given physical properties and dimensions.

(*Hint*: this system has

only one dynamic degree of freedom; this is associated with the rotatiional inertia of the rigid bar of mass m.)

2.
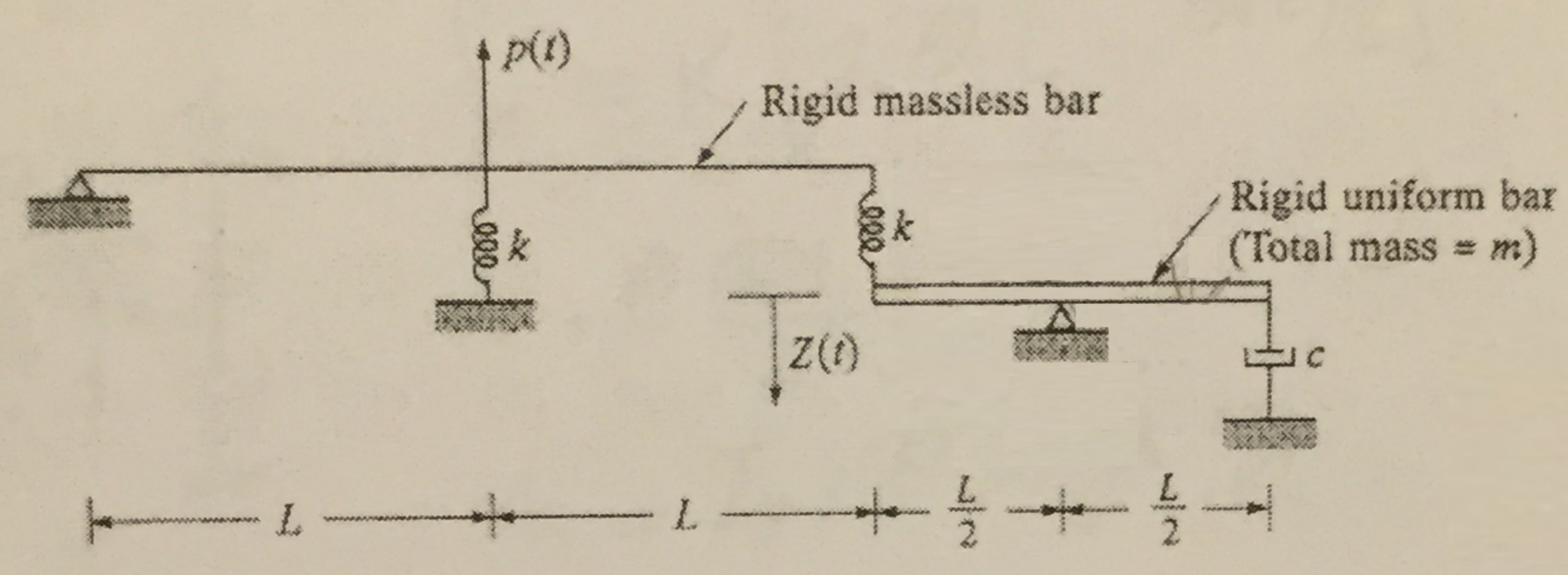
shown below

The column of Fig P8-4 is to be treated as a SDOF system by defining its displaced shape as

$$\psi(x) = \frac{v(x,t)}{Z(t)} = \left(\frac{x}{L}\right)^2 \left(\frac{3}{2} - \frac{x}{2L}\right)$$

Denoting the uniformly distributed mass per unit length by $\bar{m}$, the uniform stiffness by EI, and the uniformly distributed load per unit length by $\bar{p}(t)$, evaluate the generalized physical properties m^* and k^* and the generalized loading $p^*(t)$.