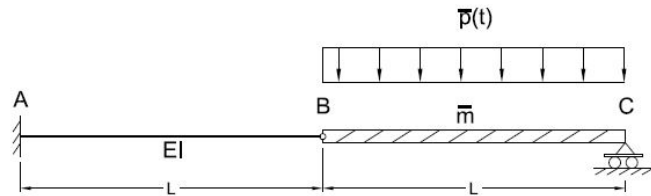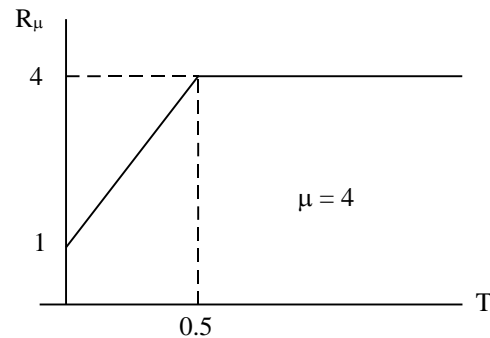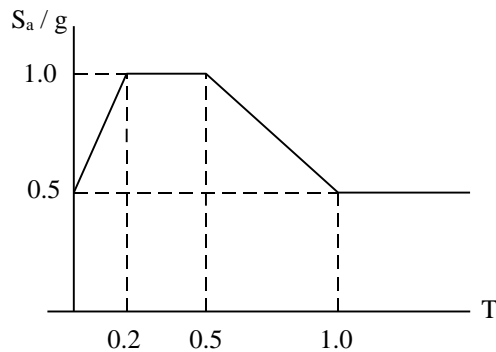Solve the questions given below.

1)

a) Determine the equation of motion for the following system given above. Ignore damping and the mass of the member AB.

b) Solve the equation of motion under an initial displacement of $u_B(0) = 1$ where u_B is the vertical displacement of point B. Note: $\bar{p}(t) = 0$.

2) An elastic undamped acceleration response spectrum, an elasto-plastic SDOF system and its R_μ-μ-T spectrum are given below.
    a) Calculate the linear elastic displacement spectrum S_d.
    b) Calculate the inelastic acceleration spectrum for $\mu = 4$.
    c) Calculate the inelastic displacement spectrum $\mu = 4$.

3) Determine the undamped acceleration response spectrum Sa(T) under the ground acceleration pulse shown for $0 \leq T \leq 2$ sec.