Name_____ Student number_____

Assignment 3

Consider the cantilever structure on pages 7-10 of the lecture notes. Simplify the setting by omitting the displacement transducer rods and weight of the cantilever. Represent the mass loading as a force moment pair acting on the axis of the cantilever and use the Bernoulli beam boundary value problem

$$\frac{d^4w}{dx^4} = 0 \text{ in } (0, L), \quad \frac{d^2w}{dx^2} = 0 \text{ and } \frac{d^3w}{dx^3} = \frac{mg}{EI} \text{ at } x = L, \quad w = \frac{dw}{dx} = 0 \text{ at } x = 0$$

to find the vertical displacement w (positive upwards) at the free end $x = L$ in terms of the geometric and material parameters of the structure.