

國立嘉義大學九十六學年度

生物機電工程學系碩士班招生考試 (甲組) 試題

科目：工程力學

(※禁止使用計算機)

1. A homogeneous block weighs 600 N (in Figure 1) on a horizontal floor and the friction coefficient between the floor and the block is 0.35. If the force P increases gradually until motion occurs, will the block slide or tip and for what value of P ? (20%)

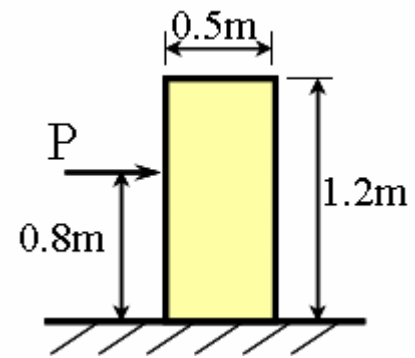


Figure 1

2. A bullet is shot vertically upward with a muzzle speed of v_0 . Assuming air resistance to be cv^2 , determine the height to which it goes and velocity with which it returns to earth. (20%)
3. A slender bar of mass m is released from rest in the position shown in Figure 2. The static and kinetic coefficients of friction at the floor and wall have the same value μ . If the bar slips, what is its angular acceleration at the instant of release? (20%)

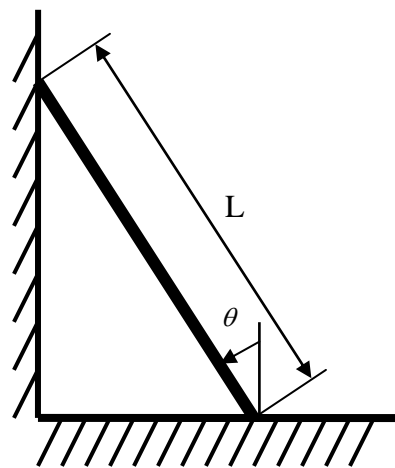


Figure 2

4. Draw the shear-force and bending-moment diagrams shown in the Figure 3 for a beam with a uniform load of intensity q and a concentrated load P . (20%)

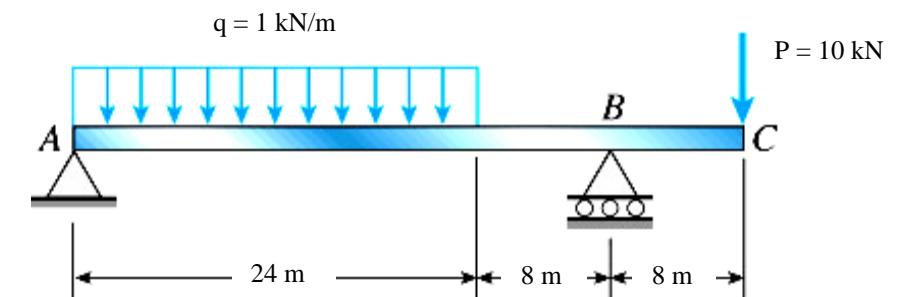


Figure 3

5. Find the angle of rotation θ_B and deflection δ_B at the free end B of a cantilever beam AB (in Figure 4) supporting a uniform load of intensity q acting over the beam. The beam has length L and two different flexural rigidity $2EI$ and EI . (20%)

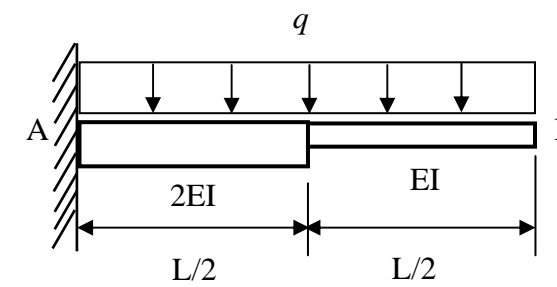


Figure 4