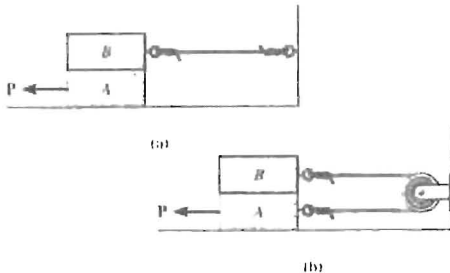
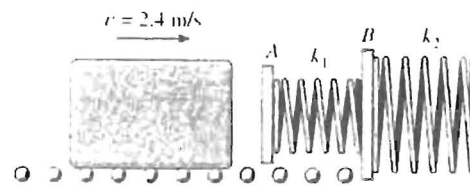


※ 考生請注意：本試題 可 不可 使用計算機

1. Each of the two blocks has a mass  $m$ . The coefficient of kinetic friction at all surfaces of contact is  $\mu$ . If a horizontal force  $P$  is applied to the bottom block, determine the acceleration of the block in each case. (20%)



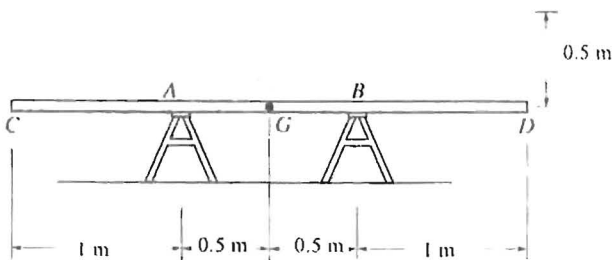
Problem 1 (20%)



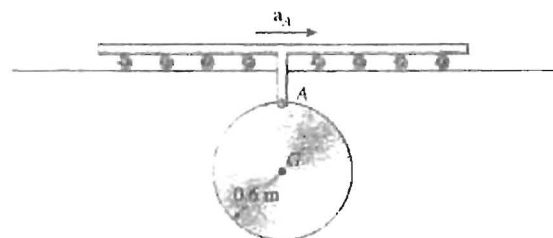
Problem 2 (20%)

2. The double-spring bumper is used to stop the 7500-N steel block in the rolling mill. Determine the maximum deflection of the plate A caused by the block if it strikes the plate with a speed of 2.4m/s. Neglect the mass of the springs, rollers and the plates A and B. Take  $k_1=50000\text{N/m}$ ,  $k_2=75000\text{N/m}$ . (20%)

3. The Plank has a weight of 20kg, center of gravity at G, and it rests on the two sawhorses at A and B. If the end D is raised 0.5m above the top of the sawhorses and is released from rest, determine how high end C will rise from the top of the sawhorses after the plank falls so that it rotates clockwise about A, strikes and pivots on the sawhorse at B, and rotates clockwise off the sawhorse at A. (30%)



Problem 3 (30%)



Problem 4 (30%)

4. The 75-N circular plate is suspended from a pin at A. If the pin is connected to a track which is given an acceleration  $a_A=1.5\text{m/s}^2$ , determine the horizontal and vertical components of reaction at A, the angular acceleration of the plate, and its acceleration at mass center G. (30%)