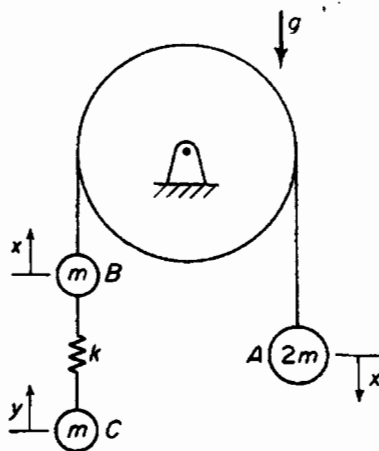
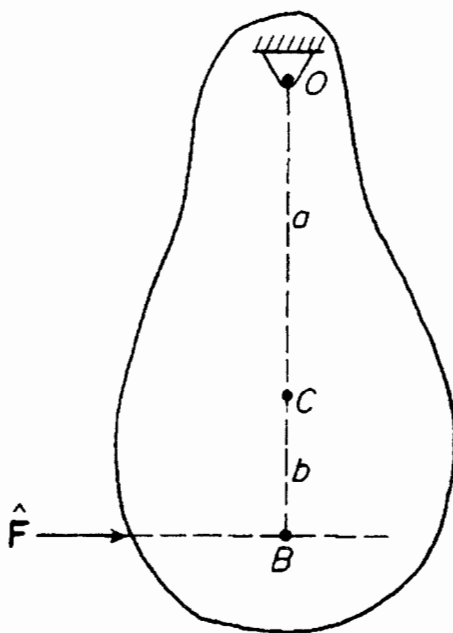


※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (25%) Consider the following figure. Particles A and B are connected by a massless, inextensible cord which goes around a massless pulley. If the system is released from rest with the spring initially unstressed, find: (a) the maximum stretch in the spring; (b) the maximum velocity of particle C.



2. (25%) A rigid body can rotate about a fixed axis through the point O which is located at a distance a from the center of mass C , as shown in the following figure. The body is struck an impulsive blow of magnitude \hat{F} which is in the plane of the motion and is perpendicular to the line OC . Find the distance b between the center of mass and the line of action of the impulse such that the body exerts no impulsive reaction on the support at O .



※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

3. As shown in figure 3, the ends of the slender rod AB of length L and mass M are moving along the circular slot without friction. When the rod is at the angle position θ and with V speed upward at A, answer the following questions using fixed coordinates Oxy :
- the velocity at the center of the rod; (10%)
 - reaction forces at A and B. (15%)
4. For the system shown in figure 4, the moment of inertia of the circular disc of radius r and mass m is I_o and I_t about z -axis and x -axis, respectively.
- Find the angular momentum of the disc about fixed point O. (10%)
 - If rotation p and Ω are constant and OC is in horizontal position, derive the torque applied at x_o -axis. (15%).

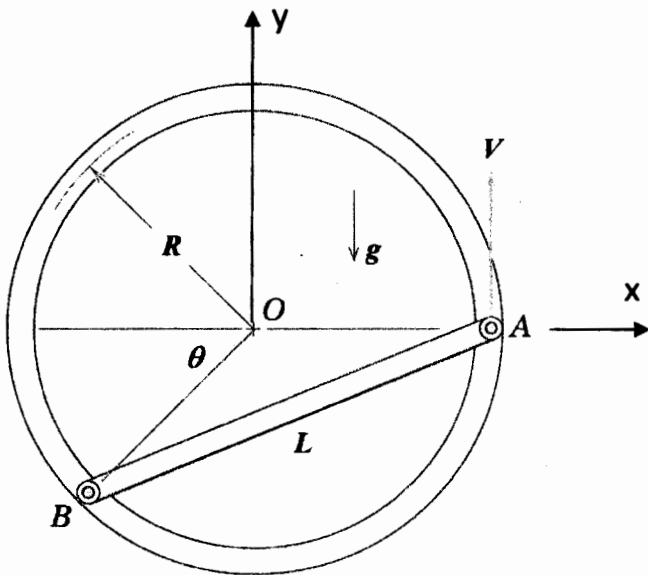


Figure 3

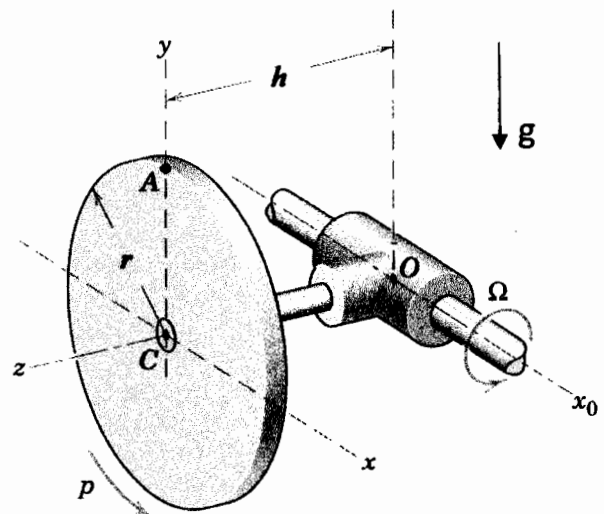


Figure 4