淡江大學九十二學年度碩士班招生考試試題

系別：航空太空工程學系　　　　科目：動　力　學

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簡單型計算機
○

P. ½

本試題共 **2** 頁

1. A pin moves with a velocity of 2 *m/sec* and an acceleration of 1 *m/sec²* along a slot in a disk which is rotating with an angular velocity of 5 *rad/sec* and an angular acceleration of 4 *rad/sec²* in the clockwise direction (shown in *Figure* 1). Calculate the absolute velocity and acceleration of this pin. . (30%)
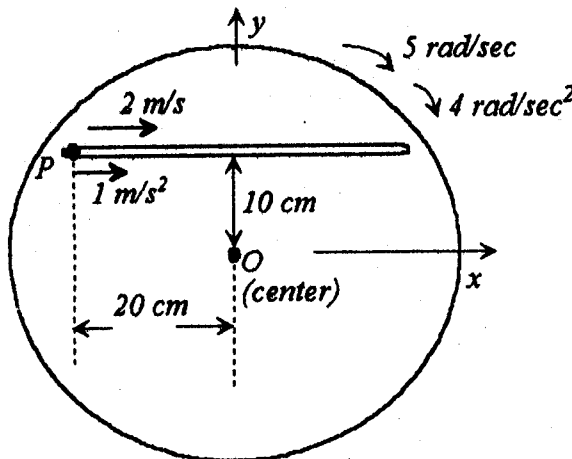
2. A 10 *kg* block (*A*) rests on a smooth surface and the spring is compressed 0.1 meters. It is attached to an inextensible cord over frictionless, weightless pulleys to a 24 *kg* mass (*B*) as shown in *Figure* 2. If the system is released from rest and *B* travels 0.1 *m*, what is the velocity of *A*? The spring is attached to the objects at both ends and *K=490 N/m*. (20%)
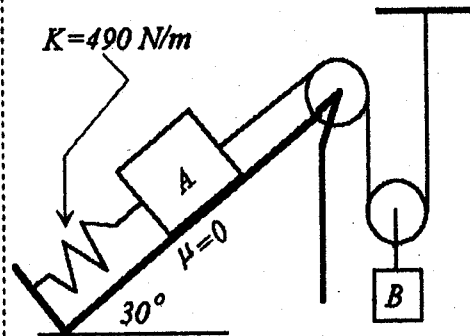

Figure 1.

Figure 2.

3. The 50 *kg* uniform rod *AB* is released from rest in the position shown in *Figure* 3. Knowing that end *B* may slide free on the frictionless floor, determine (1) the tension in wire *AC* (10%), (2) the reaction at point *B* . (10%)
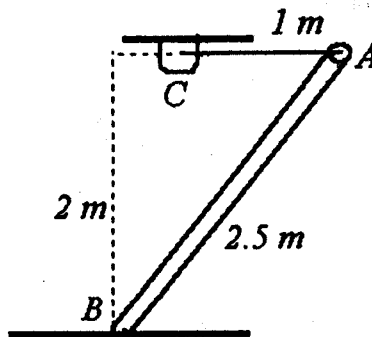

Figure 3.

◄ 注意背面尚有試題 ►

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P.2/2

本試題共 **2** 頁

4. *Figure* 4*A* shows a system of particles at time *t*1. *Figure* 4*B* shows the same particles at time *t*2.

(1) What is the linear impulse exerted on the system between *t*1 and *t*2? (15%)

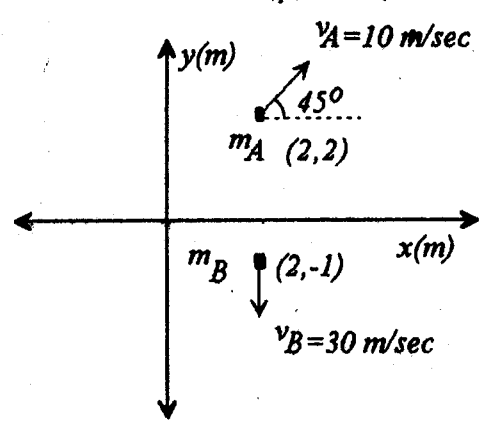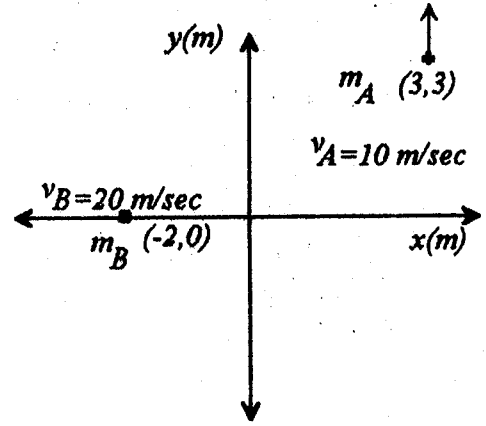(2) What is the total angular impulse during the time interval about the origin? (15%)

Figure 4 A

Figure 4 B