重庆大学 《Kinematics and Kinetics》 课程试卷

☉A卷
○B卷

2015 — 2016 学年 第 一 学期

开课学院：机械工程学院 课程号：ME30821 考试日期：＿＿＿＿＿

考试方式： ○开卷 ☉闭卷 ○其他 考试时间：＿＿＿＿分钟

题号	一	二	三	四	五	六	七	八	九	十	总 分
得分											

考试提示

1.严禁随身携带通讯工具等电子设备参加考试；

2.考试作弊，留校察看，毕业当年不授学位；请人代考、替他人考试、两次及以上作弊等，属严重作弊，开除学籍。

一、（16 分）

The system shown starts from rest, and each component moves with a constant acceleration. If the relative acceleration of block C with respect to collar B is 60mm/s² upward and the relative acceleration of block D with respect to block A is 110mm/s² downward, determine (a) the velocity of block C after 3s, (b) the change in position of block D after 5 s.
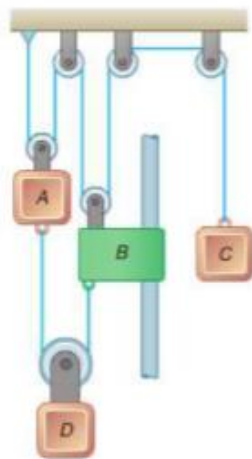
二、（16 分）

A spring is used to stop a 50-kg package which is moving down a 20° incline. The spring has a constant k=30 kN/m and is held by cables so that it is initially compressed 50 mm. Knowing that the velocity of the package is 2 m/s when it is 8m from the spring and neglecting friction, determine the maximum additional deformation od the spring in bringing the package to rest.
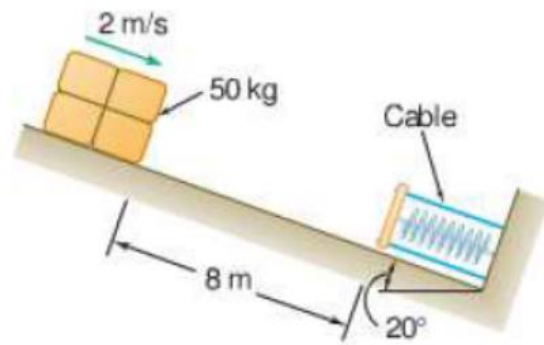
四、（16 分）

Both 6in radius wheels roll without slipping on the horizontal surface. Knowing that the distance AD is 5 in., the distance BE is 4 in., and D has a velocity of 6in/s to the right, determine the velocity of point E. 15.70
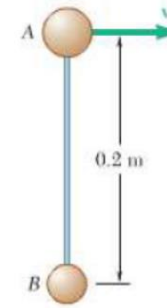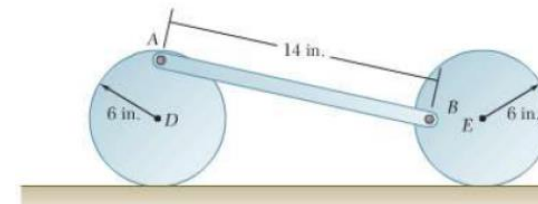

三、（16 分）

Two small spheres A and B, of mass 2.5 kg and 1 kg, respectively, are connected by a rigid rod of negligible mass. The two spheres are resting on a horizontal, frictionless surface when A is suddenly given the velocity $v_0 = (3.5m/s)i$. Determine (a) the linear momentum of the system and its angular momentum about its mass center G, (b) the velocity of A and B after the rod AB has rotated through 120° clockwise.
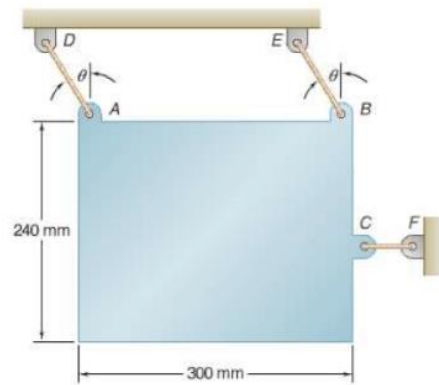
五、（16 分）

A uniform rectangular plate has a mass of 5 kg and is held in position by three ropes as shown. Knowing that $\theta = 30^0$, determine immediately after rope CF has been cut, (a) the acceleration of the plate, (b) the tension in ropes AD and BE. 10-16.14

六、（20 分）

Knowing that at the instant shown bar DE has a constant angular velocity of 18rad/s clockwise, determine (a) the acceleration of point B, (b) the acceleration of point G. 15.129