

**HASHEMITE UNIVERSITY**  
**Department of Mechanical Engineering**

**Second Exam**

**Dynamics**

**July 26<sup>th</sup> 2007**

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**Name:**

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**Problem 1:**

A 6-lb collar can slide without friction on a vertical rod and is resting in equilibrium on a spring. It is pushed down, compressing the spring 6 in, and released. Knowing that the spring constant is  $k = 15$  lb/in, determine

- a) The maximum height  $h$  reached by the collar above its equilibrium position
- b) The maximum velocity of the collar

**Problem 2:**

A 600-g ball A is moving with a velocity  $\mathbf{v}_A$  when it is struck by a 1.2-kg ball B which has a velocity  $\mathbf{v}_B$  of magnitude  $v_B = 6$  m/s. Knowing that the velocity of ball B is zero after impact and that the coefficient of restitution is 0.8, determine the velocity of ball A before and after impact.