**Common Exam 2**

March 14\(^{th}\), 2008, Friday (tomorrow)

**Time:** 8:30-9:45 am (Arrive by 8:15 am)

**Room:** KUPF 205

**Bring your scientific calculators**

**B1, Ch. 4 and B2, Ch. 6**

(Newton’s Laws, Forces, Circular Motions, Application of Newton’s Laws)

HW#7 due 3/17/08, Monday

Bring calculators for Thursday Quiz from now

Check course website for lecture notes and announcement:

[http://web.njit.edu/~kenahn/08spring/phy105.htm](http://web.njit.edu/~kenahn/08spring/phy105.htm)

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**From Last HW**

007 (part 1 of 2) 8 points

A block of mass 4.26 kg lies on a frictionless horizontal surface. The block is connected by a cord passing over a pulley to another block of mass 2.16 kg which hangs in the air, as shown on the following picture. Assume the cord to be light (massless and weightless) and unstretchable and the pulley to have no friction and no rotational inertia.

The acceleration of gravity is 9.8 m/s\(^2\).

Calculate the acceleration of the first block. Answer in units of m/s\(^2\).

008 (part 2 of 2) 7 points

Calculate the tension in the cord. Answer in units of N.
011 (part 1 of 1) 10 points
Static friction 0.49 between a 0.5 kg block and a 3.3 kg cart. There is no kinetic friction between the cart and the horizontal surface.

The acceleration of gravity is 9.8 m/s².

What minimum force $F$ must be exerted on the 3.3 kg cart in order for the 0.5 kg block not to fall?

3. A 25-N crate slides down a frictionless incline that is 250° above the horizontal. The magnitude of the normal force of the incline on the crate is:
A. 11N
B. 23N
C. 25N
D. 100N
E. 220N

ans: B
5. A car is traveling at 15 m/s on a horizontal road. The brakes are applied and the car skids to a stop in 4.0 s. The coefficient of kinetic friction between the tires and road is:
   A. 0.38
   B. 0.69
   C. 0.76
   D. 0.92
   E. 1.11
   ans: A

9. The iron ball shown is being swung in a vertical circle at the end of a 40-m long string. How slowly can the ball go through its top position without having the string go slack? $g=10 \text{ m/s}^2$
10. A block of mass \( m \) is pulled along a rough horizontal floor by an applied force \( T \) as shown. The vertical component on the block by the floor is

A) \( mg \)  
B) \( mg - T \cos \theta \)  
C) \( mg + T \cos \theta \)  
D) \( mg - T \sin \theta \)  
E) \( mg + T \sin \theta \)

11. A bureau rests on a rough horizontal surface ( \( \mu_k = 0.40 \), \( \mu_s = 0.50 \)). A constant horizontal force, just sufficient to start the bureau in motion, is the applied. The acceleration of the bureau is:

A) 0  
B) 0.98 m/s\(^2\)  
C) 3.3 m/s\(^2\)  
D) 4.5 m/s\(^2\)  
E) 8.9 m/s\(^2\)
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Do your best!