

**Sultan Qaboos University**  
**Physics Department, College of Science**  
**Physics 2107: Physics for Engineering I Spring Semester 2007 - Test II**

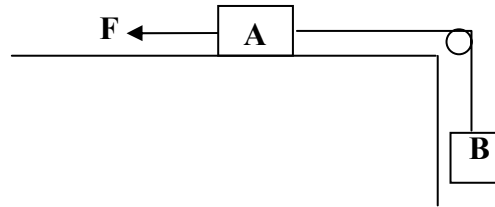
**Monday 9<sup>th</sup> April 2007**

**Time: 5:00 – 6:00 pm**

ID No.:	1	2	3	Total
Name:				

Full Mark:40 points	Please check that your examination paper has 3 <b>Questions</b> <b>Do not write your section number</b>
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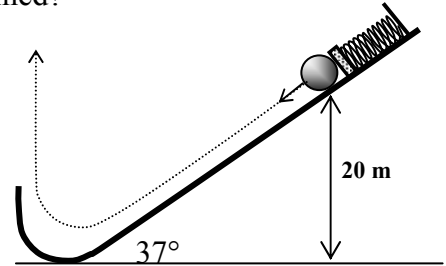
- 1- Blocks A and B shown below have weights of 44 N and 22 N respectively. The coefficient of the static friction between block A and the table is 0.20, while the coefficient of the kinetic friction between them is 0.15.
- What is the minimum magnitude of the force F that will prevent block A sliding to the right.
  - If the force F is suddenly removed
    - Determine the acceleration of block A
    - Determine the tension in the rope.



**(14 points)**

2- A spring with spring constant  $300 \text{ N/m}$  is at the top of a  $37^\circ$  frictionless inclined plane. A  $2.0 \text{ kg}$  ball is pushed against the spring and compresses it by  $80.0 \text{ cm}$ . In this position it is  $20.0 \text{ m}$  above the ground and momentarily at rest. After the ball is released and reaches the bottom of the inclined plane, it travels straight up as shown in the figure.

- a) What is the work done by the spring force? **(14 points)**  
b) What is the speed of the ball at the bottom of the inclined?  
c) What is the maximum height reached by the ball?



3- The figure below shows an approximate plot of force magnitude versus time during the collision of a 58 g rubber ball with a wall. The initial velocity of the ball is 34 m/s perpendicular to the wall; it rebounds directly back with the same speed, also perpendicular to the wall.

- a) What is the average force  $F_{ave}$  on the ball from the wall during the collision?
- b) What is the maximum force  $F_{max}$  on the ball from the wall during the collision?

**(12 points)**

