# 國立中山大學104學年度碩士暨碩士專班招生考試試題

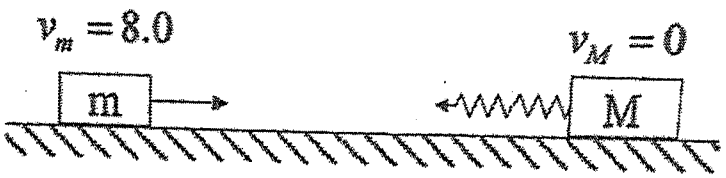
科目名稱：普通物理【醫科所碩士班選考】　　題號：428005

※本科目依簡章規定「可以」使用計算機（廠牌、功能不拘）（問答申論題）　　

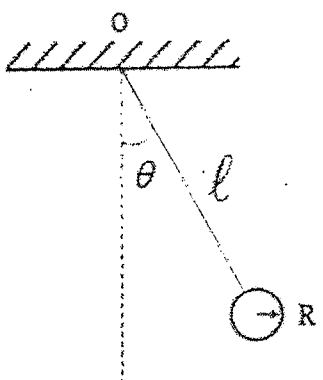
1. A stone of weight W is thrown vertically upward into the air with an initial speed u. A constant force f due to air resistance on the stone during its flight.
(a) Find the maximum height reached by stone. (5%)
(b) Find the speed of the stone upon impact with the ground. (5%)

2. Two objects with masses of $m_1$ and $m_2$ have the same kinetic energy and are both moving to the right. The same constant force F is applied to the left to both masses. If $m_1=4m_2$, what is the ratio of the stopping distance of $m_1$ to that of $m_2$? (10%)

3. A 2.0 kg block slides on the top of a frictionless table with a speed of 8.0 m/s toward another block (at rest) of mass 4.5 kg. A spring has spring constant k=850 N/m, is attached to the second block as shown in figure.
(a) What will be the maximum value when the spring is compressed? (10%)
(b) What will be the final velocities of the two blocks? (10%)




4. A cylindrical disk of mass M and radius R is hung by light string of length *l* on the rim. It is released from rest. See figure. What is the tension on the string when the disk swings to the lowest point? (10%)




5. A capacitor consists of two long concentric metal cylinders, the length L with the line charge density $\lambda$. The inner and outer cylinders have radii a and b, respectively.
(a) Find the capacitance in this cylindrical capacitor. (10%)
(b) Find the energy stored in this cylindrical capacitor in terms of line charge density. (10%)

6. Resistor 1 has twice the resistance of resistor 2. They are connected in parallel to a battery. What is the ratio of the thermal energy generation rate in 1 to that in 2? (10%)

# 國立中山大學104學年度碩士暨碩士專班招生考試試題

科目名稱：普通物理【醫科所碩士班選考】　　題號：428005

※本科目依簡章規定「可以」使用計算機（廠牌、功能不拘）（問答申論題）　　

7. The circuit shown in figure consists of a switch S, a DC power support of 12V, an inductor of inductance 2H and two resistors of 6Ω. The switch S was open for long time and close at t = 0. Determine the current $i_1$ and $i_2$ under the conditions (a) immediately after the switch is closed, (b) after the switch has been left closed for several minutes, (c) immediately after the switch is opened, (d) after the switch has been opened for long time. (20%)