

科目：普通物理

適用：應光系二

考生注意：

1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

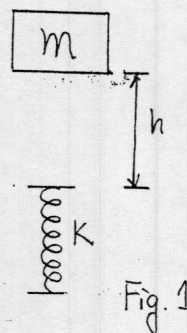
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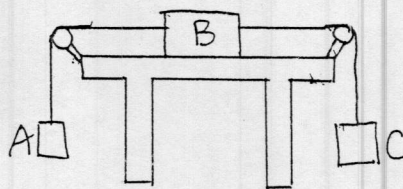
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1. (25 points) A block of mass  $m=2.0\text{kg}$  is dropped from height  $h=40\text{cm}$  onto a spring of spring constant  $k=1960\text{ N/m}$ (Fig1). Find the maximum distance the spring is compressed.



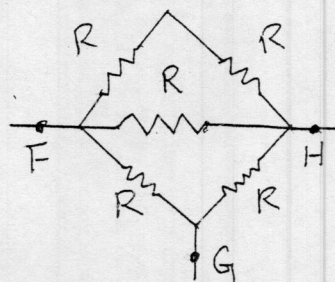
2. (25 points)

Fig.2 shows three block attached by cords that loop over frictionless pulleys. Block B lies on frictionless table; the masses are  $m_A=6.00\text{kg}$ ,  $m_B=8.00\text{kg}$ , and  $m_C=10.0\text{kg}$ . When the blocks are released, what is the tension in the cord at right?



3. (25 points)

Figure shows five  $5\Omega$  resistors. Find the equivalent resistors between points (a) F and H (b) F and G. (Hint: For each pair of point imagine that a battery is connected across the pair.)



4. (25 points)

In the ray diagram of Fig where the angles are not drawn to scale the ray is incident at the critical angle on the interface between materials 2 and 3 angle  $\phi = 60^\circ$  and two of the indexes of refraction are  $n_1 = 1.7$  and  $n_2 = 1.6$ . Find (a) index of refraction  $n_3$  and (b) angle  $\theta$  (c) If  $\theta$  is decreased does light refract into material 3?

