

科目：普通物理

適用：土木系二

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。

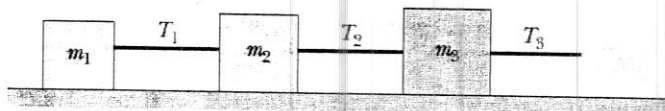
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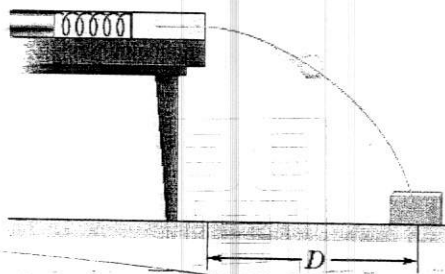
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編號：332

1. In Figure, three connected blocks are pulled to the right on a horizontal frictionless table by a force of magnitude 65.0 N. If $m_1=12.0$ kg, $m_2=24.0$ kg, and $m_3=31.0$ kg, calculate (a) the magnitude of the system's acceleration (9%), (b) the tension T_1 (8%), and (c) the tension T_2 (8%).



2. Two children are playing a game in which they try to hit a small box on the floor with a marble fired from a spring-loaded gun that is mounted on a table. The target box is horizontal distance $D = 2.20$ m from the edge of the table; see Figure. Bobby compresses the spring 1.10 cm, but the center of the marble falls 27.0 cm short of the center of the box. How far should Rhoda compress the spring to score a direct hit? Assume that neither the spring nor the ball encounters friction in the gun. (25%)



3. The equation of a transverse wave on a string is

$$y = (2.0\text{mm})\sin[(20\text{m}^{-1})x - (600\text{s}^{-1})t]$$

The tension in the string is 15 N. (a) What is the wave speed? (10%) (b) Find the linear density of this string in grams per meter. (15%)

4. In figure below, the battery has a potential difference of $V = 10.0$ V and the five capacitors each have a capacitance of $10.0 \mu\text{F}$. What is the charge on (a) capacitor 1 (10%) and (b) capacitor 2? (15%)

