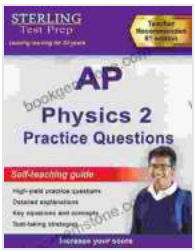
High Yield AP Physics Practice Questions With Detailed Explanations

The AP Physics exam is a challenging test that requires students to have a deep understanding of the subject matter. In order to prepare for the exam, it is important to practice solving problems that are similar to the ones that will appear on the test. This article provides a comprehensive collection of high yield AP Physics practice questions with detailed explanations.



Sterling Test Prep AP Physics 2 Practice Questions: High Yield AP Physics 2 Practice Questions with Detailed Explanations by Sterling Test Prep

★★★★★ 5 out of 5

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Mechanics

1. **A block of mass m slides down a frictionless inclined plane of height h. What is the block's speed at the bottom of the plane?**

   Explanation: The block's speed at the bottom of the plane can be found using the conservation of energy. The initial energy of the block is all potential energy, and the final energy of the block is all kinetic energy. Therefore, we have:

   $$PE_i = KE_f$$

$$mgh = \frac{1}{2}mv^2$$

$$v = \sqrt{2gh}$$

2. **A car of mass m is traveling at a speed v when it brakes to a stop. What is the distance the car travels before it comes to a stop?**

   Explanation: The distance the car travels before it comes to a stop can be found using the equation of motion:

   $$v^2 = u^2 + 2as$$

   where:

- v is the final velocity (0 m/s)
- u is the initial velocity (v m/s)
- a is the acceleration (-a m/s^2)
- s is the distance traveled (m)

Solving for s, we get:

$$s = \frac{v^2}{2a}$$

- **A ball is thrown vertically into the air with an initial velocity v. What is the maximum height the ball reaches?**

Explanation: The maximum height the ball reaches can be found using the equation of motion:

$$v^2 = u^2 + 2as$$

where:

- v is the final velocity (0 m/s)
- u is the initial velocity (v m/s)
- a is the acceleration (-g m/s^2)
- s is the distance traveled (h m)

Solving for h, we get:

$$h = \frac{v^2}{2g}$$

Electricity and Magnetism

1. **A circuit consists of a battery, a resistor, and a capacitor. What is the time constant of the circuit?**

   Explanation: The time constant of a circuit is the amount of time it takes for the current in the circuit to reach 63% of its maximum value. The time constant can be found using the equation:

   $$\tau = RC$$

   where:

   - τ is the time constant (s)
   - R is the resistance of the resistor (Ω)
   - C is the capacitance of the capacitor (F)

- **A magnetic field is applied to a current-carrying wire. What is the direction of the force on the wire?**

Explanation: The direction of the force on the wire can be found using the right-hand rule. If you point your right thumb in the direction of the current and your fingers in the direction of the magnetic field, then your palm will point in the direction of the force.

- **A transformer is used to step up the voltage of an AC circuit. What is the ratio of the output voltage to the input voltage?**

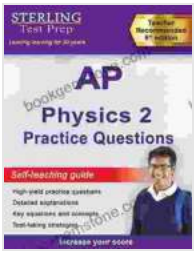
Explanation: The ratio of the output voltage to the input voltage in a transformer is equal to the ratio of the number of turns in the secondary coil to the number of turns in the primary coil. Therefore, we have:

$$\frac{V_o}{V_i}= \frac{N_s}{N_p}$$

where:

- V_o is the output voltage (V)
- V_i is the input voltage (V)
- N_s is the number of turns in the secondary coil
- N_p is the number of turns in the primary coil

These are just a few examples of high yield AP Physics practice questions. By practicing these problems, you can improve your understanding of the subject matter and prepare for the AP Physics exam.



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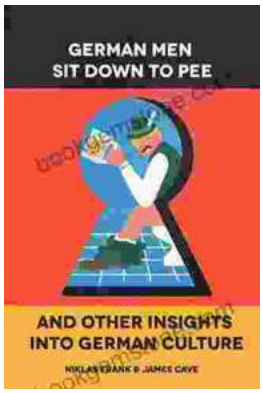

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