

# 2000 physics past paper answers

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### 2000 Physics Past Paper Answers: A Comprehensive Study Resource

Physics students seeking to improve their understanding and exam performance can benefit tremendously from referring to past paper answers. By carefully reviewing these answers, students can identify common question formats, assess their own knowledge gaps, and reinforce core concepts. Here are a few examples of questions and answers from the 2000 Physics past paper:

#### Question 1:

A ball is thrown vertically upwards with a velocity of 10 m/s. Calculate the maximum height it reaches.

#### Answer:

The equation of motion for a projectile is:

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

where  $v$  is the final velocity,  $u$  is the initial velocity,  $a$  is the acceleration due to gravity ( $-9.8 \text{ m/s}^2$ ), and  $s$  is the displacement.

At the maximum height, the final velocity is 0 m/s. Substituting the values into the equation, we get:

$$0^2 = 10^2 + 2(-9.8)s$$

Solving for  $s$ , we find that the maximum height is approximately 5.1 m.

#### Question 2:

A car of mass 1000 kg accelerates uniformly from rest to a velocity of 20 m/s in 5 seconds. Calculate the average force acting on the car.

**Answer:**

The equation of motion for a uniformly accelerating object is:

$$v = u + at$$

where  $v$  is the final velocity,  $u$  is the initial velocity,  $a$  is the acceleration, and  $t$  is the time.

Substituting the values into the equation, we find that the acceleration is  $4 \text{ m/s}^2$ .

The average force acting on the car can be calculated using the equation:

$$F = ma$$

where  $F$  is the force,  $m$  is the mass, and  $a$  is the acceleration.

Substituting the values into the equation, we find that the average force acting on the car is 4000 N.

**Question 3:**

A capacitor of capacitance  $5 \text{ } \mu\text{F}$  is charged to a potential difference of 10 V. Calculate the energy stored in the capacitor.

**Answer:**

The equation for the energy stored in a capacitor is:

$$E = \frac{1}{2}CV^2$$

where  $E$  is the energy,  $C$  is the capacitance, and  $V$  is the potential difference.

Substituting the values into the equation, we find that the energy stored in the capacitor is  $2.5 \text{ J}$ .

**Question 4:**

Explain the principle of superposition as it applies to waves.

**Answer:**

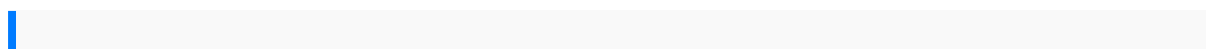
The principle of superposition states that when two or more waves cross at a point, the resulting displacement at that point is the algebraic sum of the individual displacements each wave would produce if the other were absent. In other words, waves can pass through each other without affecting each other's propagation.

**Question 5:**

Discuss the relationship between the electric field and potential within a conductor.

**Answer:**

Within a conductor, the electric field is zero. This is because conductors allow electrons to move freely, and any charge buildup within the conductor would quickly result in a net electric field that would neutralize the charge. The potential within a conductor is therefore constant.



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