

# Fundamental Physics Quiz

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**Topic:** Physics | **Questions:** 10 | **Time:** 15 mins | **Passing:** 70%

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## Q1. What is the SI unit of force?

*Difficulty: easy | Topic: Mechanics*

- A) Joule
- B) Watt
- C) Newton
- D) Pascal

**Answer:** C

**Explanation:** The SI unit of force is the Newton (N). A Joule is the unit for energy, a Watt for power, and a Pascal for pressure.

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## Q2. Heat always flows from a colder body to a hotter body without external work.

*Difficulty: easy | Topic: Thermodynamics*

- A) True
- B) False

**Answer:** B

**Explanation:** According to the second law of thermodynamics, heat naturally flows from a hotter body to a colder body. For heat to flow from cold to hot, external work (like in a refrigerator) is required.

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**Q3. The flow of electric charge is known as \_\_\_\_.**

*Difficulty: easy | Topic: Electricity*

**Answer:** electric current

**Explanation:** Electric current is defined as the rate of flow of electric charge through a conductor.

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**Q4. A car accelerates from rest at  $3 \text{ m/s}^2$  for 4 seconds. What is its final velocity?**

*Difficulty: medium | Topic: Kinematics*

• **A)** 7 m/s

• **B)** 12 m/s

• **C)** 1.33 m/s

• **D)** 48 m/s

**Answer:** B

**Explanation:** Using the kinematic equation  $v = u + at$ , where  $u$  (initial velocity) = 0 m/s,  $a$  (acceleration) = 3 m/s<sup>2</sup>, and  $t$  (time) = 4 s. So,  $v = 0 + (3 \text{ m/s}^2 * 4 \text{ s}) = 12 \text{ m/s}$ .

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### **Q5. Which phenomenon causes a spoon to appear bent when placed in a glass of water?**

*Difficulty: medium | Topic: Optics*

- A) Diffraction
- B) Refraction
- C) Reflection
- D) Dispersion

**Answer: B**

**Explanation:** Refraction is the bending of light as it passes from one medium to another (e.g., from water to air), causing objects partially submerged to appear distorted or 'bent'.

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### **Q6. Sound waves are transverse waves.**

*Difficulty: medium | Topic: Waves*

- A) True
- B) False

**Answer:** B

**Explanation:** Sound waves are longitudinal waves, meaning the particles of the medium oscillate parallel to the direction of wave propagation. Transverse waves (like light) have oscillations perpendicular to the direction of propagation.

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**Q7. According to the Law of Conservation of Energy, energy cannot be created or \_\_\_\_.**

*Difficulty: medium | Topic: Energy*

**Answer:** destroyed

**Explanation:** The Law of Conservation of Energy states that energy can be transformed from one form to another, but it cannot be created or destroyed in an isolated system.

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**Q8. Which principle states that it is impossible to know precisely both the position and momentum of a particle simultaneously?**

*Difficulty: hard | Topic: Quantum Mechanics*

- A) Pauli Exclusion Principle
- B) Heisenberg Uncertainty Principle
- C) Correspondence Principle
- D) Principle of Equivalence

**Answer:** B

**Explanation:** The Heisenberg Uncertainty Principle, a fundamental concept in quantum mechanics, states this inherent limitation in measuring conjugate variables like position and momentum.

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**Q9. Two resistors,  $10\ \Omega$  and  $20\ \Omega$ , are connected in parallel to a  $12V$  battery. What is the total current drawn from the battery?**

*Difficulty: hard | Topic: Circuits*

- A) 0.9 A
- B) 1.2 A
- C) 1.8 A
- D) 3.6 A

**Answer: C**

**Explanation:** For parallel resistors,  $1/R_{\text{total}} = 1/R_1 + 1/R_2$ . So,  $1/R_{\text{total}} = 1/10 + 1/20 = 2/20 + 1/20 = 3/20$ .  $R_{\text{total}} = 20/3\ \Omega$ . Using Ohm's Law,  $I = V/R_{\text{total}} = 12V / (20/3\ \Omega) = 12V * (3/20\ \Omega) = 36/20\ A = 1.8\ A$ .

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**Q10. Which of the following is a scalar quantity?**

*Difficulty: medium | Topic: Vectors and Scalars*

- A) Velocity
- B) Force

- C) Acceleration

- D) Mass

**Answer:** D

**Explanation:** A scalar quantity has magnitude only, while a vector quantity has both magnitude and direction. Mass is a scalar, whereas velocity, force, and acceleration are all vector quantities.

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