

Fundamental Physics Facts

Physics · Answer Key · 8 Questions

1. Which fundamental force is responsible for holding the nucleus of an atom together, overcoming the electrostatic repulsion between protons?

- A) Gravitational force
- B) Electromagnetic force
- C) Weak nuclear force

D) Strong nuclear force

2. According to the second law of thermodynamics, in any isolated system, the total entropy tends to:

- A) Decrease over time
- B) Remain constant

C) Increase over time

- D) Fluctuate randomly without a trend

3. The photoelectric effect, where electrons are emitted from a material when light shines on it, was explained by Albert Einstein and provided strong evidence for the particle nature of light, demonstrating that light energy is quantized in discrete packets called:

- A) Waves

B) Photons

- C) Electrons
- D) Quarks

4. What phenomenon describes the bending of waves as they pass around an obstacle or through an aperture?

- A) Reflection
- B) Refraction

C) Diffraction

- D) Interference

5. The cosmological constant, introduced by Einstein, was originally proposed to counteract gravity and maintain a static universe. Later, it was revived to explain the observed:

- A) Black hole evaporation

B) Accelerated expansion of the universe

- C) Formation of galaxies
- D) Dark matter distribution

6. Which famous equation by Paul Dirac unified quantum mechanics with special relativity and predicted the existence of antimatter?

- A) Schrödinger equation
- B) Heisenberg uncertainty principle
- C) Dirac equation**
- D) Einstein's field equations

7. The concept of 'spacetime' as a unified four-dimensional continuum is a cornerstone of which theory developed by Albert Einstein?

- A) Quantum Field Theory
- B) Special Relativity
- C) General Relativity**
- D) Newtonian Mechanics

8. The discovery of the Higgs boson in 2012 at CERN provided experimental confirmation for the mechanism that gives elementary particles their:

- A) Electric charge
- B) Spin
- C) Mass**
- D) Color charge