

Pioneering Moments in Advanced Physics

Advanced Physics · Answer Key · 12 Questions

1. Who is credited with the first experimental demonstration of the photoelectric effect, a phenomenon that earned him a Nobel Prize?

- A) Albert Einstein
- B) Max Planck
- C) Heinrich Hertz**
- D) Niels Bohr

2. The discovery of the neutron, a neutral subatomic particle, was first announced by which physicist in 1932?

- A) Ernest Rutherford
- B) Enrico Fermi
- C) James Chadwick**
- D) J.J. Thomson

3. Which scientist developed the first successful theory of the atom, proposing that electrons orbit the nucleus in specific energy levels, and is often referred to as the 'father of nuclear physics'?

- A) Max Planck
- B) Albert Einstein
- C) Ernest Rutherford**
- D) Niels Bohr

4. The first observation of a stable antimatter particle, the positron, was made by which physicist in 1932 using a cloud chamber?

- A) Paul Dirac
- B) Carl D. Anderson**
- C) Enrico Fermi
- D) Wolfgang Pauli

5. Which physicist is credited with the first successful theoretical explanation of superconductivity in 1957, known as the BCS theory?

- A) John Bardeen
- B) Leon Cooper
- C) J. Robert Schrieffer
- D) All of the above**

6. The groundbreaking discovery of the muon, a lepton similar to the electron but with a greater mass, was first detected in cosmic rays by which experiment in 1936?

A) The Anderson-Neddermeyer experiment

B) The Yukawa-Oppenheimer experiment

C) The Chadwick-Dirac experiment

D) The Fermi-Bohr experiment

7. Who proposed the existence of the neutrino in 1930 to explain the apparent violation of energy conservation in beta decay, a particle later experimentally confirmed?

A) Enrico Fermi

B) Wolfgang Pauli

C) Hans Bethe

D) Fritz London

8. The first observation of laser light, a coherent beam of electromagnetic radiation, was achieved in which year?

A) 1958

B) 1960

C) 1962

D) 1965

9. Which physicist developed the first successful unified field theory attempting to unify electromagnetism and gravity, though it was later superseded?

A) Albert Einstein

B) Niels Bohr

C) Max Planck

D) Hendrik Lorentz

10. The discovery of the first meson, the pi-meson (pion), was first hypothesized by which physicist in 1935 to explain nuclear forces?

A) Hideki Yukawa

B) Robert Oppenheimer

C) Isidor Isaac Rabi

D) Eugene Wigner

11. The first direct detection of gravitational waves, predicted by Einstein's theory of general relativity, was announced by which collaboration in 2016?

A) LIGO (Laser Interferometer Gravitational-Wave Observatory)

B) VERITAS (Very Energetic Radiation Imaging Array Sensitivity Telescope)

C) AMS (Alpha Magnetic Spectrometer)

D) HIRES (High Resolution Echelle Spectrometer)

12. Who is credited with the first experimental verification of parity non-conservation in weak interactions, a discovery that revolutionized particle physics?

A) Chien-Shiung Wu

B) Tsung-Dao Lee

C) Chen Ning Yang

D) Frederick Reines