Astrophysics Fundamentals

Astrophysics · Practice Test · 10 Questions

1. What is the primary process that powers stars like our Sun?

A) Gravitational collapse
B) Nuclear fusion of hydrogen into helium
C) The annihilation of matter and antimatter
D) Radioactive decay of heavy elements

2. Which astronomical phenomenon is characterized by the rapid spinning of a neutron star, emitting beams of electromagnetic radiation?

A) Supernova remnant
B) Accretion disk
C) Pulsar
D) Quasar

3. According to the standard model of cosmology, what is the predominant form of matter in the universe, interacting only gravitationally?

A) Baryonic matter (protons and neutrons)
B) Dark energy
C) Dark matter
D) Neutrinos

4. What is the name for a region of spacetime where gravity is so strong that nothing, not even light, can escape?

A) Neutron star
B) White dwarf
C) Black hole
D) Red giant

5. Which telescope played a crucial role in discovering the accelerating expansion of the universe, leading to the concept of dark energy?

A) Hubble Space Telescope
B) James Webb Space Telescope
C) Chandra X-ray Observatory
D) Spitzer Space Telescope

6. What is the process by which heavier elements, such as iron and gold, are formed within stars or during stellar explosions?

A) Nucleosynthesis
B) Photoevaporation
C) Compton scattering
D) Zeeman splitting

7. The Cosmic Microwave Background (CMB) radiation is considered strong evidence for which cosmological theory?

A) Steady State Theory
B) Inflationary Cosmology
C) Big Bang Theory
D) String Theory

8. Which of the following is the most massive type of star, typically ending its life in a Type II supernova?

A) Red dwarf
B) Brown dwarf
C) Massive star (greater than 8 solar masses)
D) White dwarf

9. What phenomenon causes the apparent shift in frequency of electromagnetic waves (or sound waves) emitted by a source moving relative to an observer?

A) Gravitational lensing
B) Doppler effect
C) Compton scattering
D) Redshift (gravitational)

10. What is the theoretical maximum mass for a neutron star before it collapses into a black hole, estimated to be around 2 to 3 solar masses?

A) Chandrasekhar limit
B) Tolman-Oppenheimer-Volkoff limit
C) Eddington limit
D) Jeans mass