

Name: _____ Date: _____

Cosmic Evolution Ninth Grade Astronomy Quiz

Calculate cosmic redshifts and evaluate galactic morphology to determine how the universe's accelerating expansion challenges our understanding of dark energy.

1. Which observation served as the primary evidence for the discovery of the accelerating expansion of the universe in the late 1990s?

- A. The orbital velocities of stars in the Andromeda Galaxy
- B. The light curves of distant Type Ia supernovae
- C. The discovery of the Great Attractor in the Laniakea Supercluster
- D. The gravitational lensing effects of the Bullet Cluster

2. The Cosmological Principle assumes that on a sufficiently large scale, the universe is both isotropic and homogeneous.

- A. True
- B. False

3. The _____ describes the relationship where the recessional velocity of a galaxy is directly proportional to its distance from an observer.

- A. Oort Cloud Limit
- B. Hubble-Lemaître Law
- C. Schwarzschild Radius
- D. Chandrasekhar Limit

4. According to the hierarchical model of galaxy formation, how did massive elliptical galaxies most likely originate?

- A. Direct collapse of pristine primordial gas clouds
- B. The cooling of the intergalactic medium in voids
- C. The merger of multiple smaller spiral galaxies
- D. Evaporation of dark matter halos in high-density regions

5. Baryonic matter (atoms) makes up approximately 85% of the total matter content in the universe.

- A. True
- B. False

6. Which of the following describes the 'Recombination' epoch, which occurred roughly 380,000 years after the Big Bang?

- A. The moment gravity split from the other fundamental forces
- B. The synthesis of the first heavy elements like Carbon
- C. The stage when electrons and protons formed neutral hydrogen
- D. The collision of the Milky Way with the Sagittarius Dwarf

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7. A galaxy showing a high rate of star formation, often triggered by gravitational interactions, is known as a ____ galaxy.

- A. Quiescent
- B. Starburst
- C. Lenticular
- D. Seyfert

8. What is the primary role of Dark Matter in the formation of the Cosmic Web?

- A. It provides the gravitational scaffolding for gas to settle into
- B. It acts as a repulsive force that pushes galaxies apart
- C. It fuels the nuclear fusion inside the first Population III stars
- D. It creates the magnetic fields that align spiral arms

9. The 'Great Wall' and the 'Sloan Great Wall' are examples of filaments within the large-scale structure of the universe.

- A. True
- B. False

10. Extremely luminous active galactic nuclei powered by gas spiraling into supermassive black holes in the distant universe are called ____.

- A. Pulsars
- B. Quasars
- C. Magnetars
- D. Brown Dwarfs