

Name: _____ Date: _____

Blast Through the Hubble Flow: 10th Grade Cosmology Quiz

Synthesize data on galactic spectroscopy and cosmic topology. High schoolers move beyond basic classifications to evaluate the accelerating expansion of the universe.

1. An observer notes a galaxy with a high concentration of Population II stars, virtually no interstellar dust, and a high velocity dispersion of its components. This galaxy likely belongs to which category?

- A. Barred Spiral (SBb)
- B. Giant Elliptical (E0)
- C. Lenticular Galaxy (S0)
- D. Starburst Galaxy

2. The paradox which posits that if the universe were infinite, static, and eternal, the night sky should be uniformly bright, is known as _____ Paradox.

- A. Fermi's
- B. Hawking's
- C. Olbers'
- D. Hubble's

3. Current cosmological consensus based on Type Ia Supernovae measurements suggests that the rate of expansion of the universe is actually increasing rather than slowing down.

- A. True
- B. False

4. Which transition in the early universe, occurring roughly 380,000 years after the Big Bang, allowed photons to travel freely and created the Cosmic Microwave Background?

- A. Nucleosynthesis
- B. The Quark Epoch
- C. Recombination
- D. The Reionization Era

5. The rotation curves of spiral galaxies, which show stars orbiting at high speeds even far from the luminous center, provide the strongest evidence for the existence of _____.

- A. Quasars
- B. Dark Matter
- C. Sgr A*
- D. Neutrinos

6. A galaxy showing a 'blueshift' in its spectral lines is moving toward the observer, according to the Doppler Effect.

- A. True

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B. False

7. Which of the following describes the Great Attractor, a gravitational anomaly in intergalactic space?

- A. A supermassive black hole at the center of the universe
- B. A concentration of mass that is pulling the Laniakea Supercluster
- C. A void in the cosmic web where no galaxies exist
- D. The point of origin for the Big Bang

8. The 'Cosmological Principle' states that on a large enough scale, the universe is both isotropic and _____.

- A. Finite
- B. Static
- C. Homogeneous
- D. Spherical

9. If the Omega parameter (the ratio of actual density to critical density) of the universe is greater than 1, what is the predicted geometric shape and fate of the universe?

- A. Flat; stays constant forever
- B. Open (Hyperbolic); expands forever
- C. Closed (Spherical); eventual 'Big Crunch'
- D. Toroidal; cycles in a loop

10. Active Galactic Nuclei (AGN), such as Seyfert galaxies, derive their enormous energy from the collision of two spiral galaxies.

- A. True
- B. False