

Cosmology Fundamentals

Cosmology · Answer Key · 20 Questions

1. In what year did Edwin Hubble publish his discovery that the universe is expanding?

- A) 1919
- B) 1929**
- C) 1939
- D) 1949

2. Approximately how many billions of years old is the universe estimated to be?

- A) 5.4
- B) 9.8
- C) 13.8**
- D) 20.2

3. What is the approximate temperature of the Cosmic Microwave Background radiation in Kelvin?

- A) 2.7 K**
- B) 15 K
- C) 100 K
- D) 273 K

4. Who proposed the 'Big Bang' theory in 1927?

- A) Albert Einstein
- B) Carl Sagan
- C) Georges Lemaître**
- D) Stephen Hawking

5. How many spatial dimensions does the standard cosmological model assume?

- A) 1
- B) 2
- C) 3**
- D) 4

6. Which space telescope was launched in 1990 to provide key data on the expansion rate of the universe?

- A) James Webb
- B) Kepler
- C) Hubble**
- D) Spitzer

7. Roughly what percentage of the universe is composed of 'dark energy'?

- A) 5%
- B) 27%
- C) 68%**
- D) 95%

8. Which year did Arno Penzias and Robert Wilson discover the Cosmic Microwave Background radiation?

- A) 1945
- B) 1964**
- C) 1985
- D) 1999

9. The 'Hubble Constant' describes the rate of expansion of the universe; its unit involves which measurement of distance?

- A) Kilometers per second per Megaparsec**
- B) Light years per century
- C) Miles per hour per galaxy
- D) Astronomical units per billion years

10. Approximately what percentage of the universe consists of ordinary matter (atoms)?

- A) 5%**
- B) 25%
- C) 50%
- D) 75%

11. Which mission, launched in 2001, provided a precise age of the universe by measuring the CMB?

- A) Voyager 1
- B) WMAP**
- C) Cassini
- D) Curiosity

12. How many years after the Big Bang did the 'recombination' era occur, allowing light to travel freely?

- A) 380,000**
- B) 1,000,000
- C) 50,000,000
- D) 1,000,000,000

13. Which scientist proposed the Cosmological Principle, stating the universe is homogeneous and isotropic?

- A) Isaac Newton
- B) Nicolaus Copernicus
- C) Arthur Eddington**
- D) Milton Humason

14. The 'Great Attractor' is a gravity anomaly located in which approximate direction?

- A) Centaurus**
- B) Orion
- C) Andromeda
- D) Polaris

15. How many 'e-folds' of expansion occurred during the theoretical inflationary epoch of the early universe?

- A) At least 60**
- B) Exactly 10
- C) Under 5
- D) Over 1000

16. What is the name of the chemical element that makes up approximately 24% of the ordinary matter in the universe?

- A) Carbon
- B) Helium**
- C) Oxygen
- D) Iron

17. In which decade did the discovery of the accelerating expansion of the universe occur?

- A) 1960s
- B) 1970s
- C) 1980s
- D) 1990s**

18. What is the speed of light in vacuum, approximately, in kilometers per second?

- A) 150,000
- B) 300,000**
- C) 450,000
- D) 600,000

19. How many astronomical units (AU) are in one light-year approximately?

- A) 63,000**
- B) 100,000
- C) 500,000
- D) 1,000,000

20. The Planck mission was launched by which space agency?

- A) NASA
- B) ESA**
- C) JAXA
- D) Roscosmos