

Cosmology Fundamentals

Cosmology · Answer Key · 20 Questions

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

- A) 1929**
- B) 1945
- C) 1915
- D) 1950

2. Approximately how many years ago did the Big Bang occur?

- A) 1.5 billion
- B) 6.8 billion
- C) 13.8 billion**
- D) 25.4 billion

3. What is the approximate percentage of dark energy in the composition of the universe?

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

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

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

5. How many degrees Kelvin is the Cosmic Microwave Background radiation?

- A) 0.5 K
- B) 2.7 K**
- C) 10.2 K
- D) 100 K

6. In which decade was the Cosmic Microwave Background radiation first discovered?

- A) 1940s
- B) 1960s**
- C) 1980s
- D) 2000s

7. How many fundamental forces are there in the standard model of cosmology?

A) 2

B) 4

C) 6

D) 8

8. What is the approximate age of the Earth?

A) 4.5 billion years

B) 10 billion years

C) 13.8 billion years

D) 1 billion years

9. The 'Hubble Constant' measures the rate at which the universe is what?

A) Shrinking

B) Rotating

C) Expanding

D) Cooling

10. Which spacecraft was launched in 2001 to map the Cosmic Microwave Background?

A) Voyager 1

B) Hubble

C) WMAP

D) Kepler

11. What percentage of the universe is composed of ordinary matter (atoms)?

A) 5%

B) 25%

C) 70%

D) 90%

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

A) 10,000

B) 63,000

C) 1,000,000

D) 500

13. Which element makes up the vast majority of the universe's baryonic matter?

A) Oxygen

B) Carbon

C) Hydrogen

D) Iron

14. In 1998, which observation changed our understanding of the universe's expansion rate?

A) Dark energy acceleration

B) Black hole formation

C) Stellar birth

D) Supernova dimming

15. How many spatial dimensions are typically considered in standard general relativity?

A) 2

B) 3

C) 4

D) 5

16. What is the speed of light in a vacuum in kilometers per second?

A) 150,000

B) 300,000

C) 450,000

D) 600,000

17. The first direct image of a black hole was captured in which year?

A) 2015

B) 2017

C) 2019

D) 2021

18. How many years does light take to travel from the Sun to the Earth?

A) 8 minutes

B) 1 hour

C) 1 day

D) 1 week

19. What was the name of the first satellite launched into orbit in 1957?

A) Explorer 1

B) Sputnik 1

C) Vostok 1

D) Apollo 1

20. Approximately how many galaxies are estimated to be in the observable universe?

A) 100 billion

B) 500 million

C) 10 trillion

D) 1 billion