

Advanced Astronomical Concepts

Astronomy · Answer Key · 18 Questions

1. Which element is the primary product of the triple-alpha process occurring in red giant stars?

- A) Carbon**
- B) Oxygen
- C) Neon
- D) Magnesium

2. What is the specific name for the boundary around a black hole from which nothing, not even light, can escape?

- A) Accretion disk
- B) Event horizon**
- C) Singularity
- D) Schwarzschild radius

3. The Oort Cloud is theorized to be located at what approximate distance from the Sun?

- A) 10-50 AU
- B) 100-500 AU
- C) 2,000-5,000 AU
- D) 10,000-100,000 AU**

4. Which moon of Saturn is characterized by its distinct 'two-tone' coloration and a massive equatorial ridge?

- A) Enceladus
- B) Dione
- C) Iapetus**
- D) Mimas

5. What is the name of the galaxy that is currently on a collision course with the Milky Way?

- A) Triangulum Galaxy
- B) Andromeda Galaxy**
- C) Sombrero Galaxy
- D) Whirlpool Galaxy

6. In the Hertzsprung-Russell diagram, the 'Main Sequence' represents stars that are primarily performing what action?

A) Fusing hydrogen into helium

B) Collapsing into white dwarfs

C) Expanding into red giants

D) Burning carbon in their cores

7. Which astronomical object is the most distant, discrete, and luminous active galactic nucleus known in the observable universe?

A) Pulsar

B) Magnetar

C) Quasar

D) Blazar

8. What phenomenon explains the observed acceleration of the expansion of the universe?

A) Dark matter

B) Dark energy

C) Cosmic microwave background

D) Quantum tunneling

9. Which chemical compound is responsible for the distinct blue color of Neptune's atmosphere?

A) Ammonia

B) Water vapor

C) Methane

D) Hydrogen sulfide

10. The 'Chandrasekhar limit' defines the maximum mass of which type of stellar remnant?

A) Neutron star

B) Black hole

C) Brown dwarf

D) White dwarf

11. Which crater on Mars is the site where the Perseverance rover landed in 2021?

A) Gale Crater

B) Jezero Crater

C) Endeavour Crater

D) Victoria Crater

12. What is the orbital period of the planet Uranus around the Sun in Earth years?

- A) 29.5 years
- B) 84.0 years**
- C) 164.8 years
- D) 248.0 years

13. Which type of radiation is considered the 'afterglow' of the Big Bang?

- A) X-ray background
- B) Gamma-ray bursts
- C) Cosmic microwave background**
- D) Synchrotron radiation

14. What is the primary constituent of the atmosphere of Venus?

- A) Nitrogen
- B) Oxygen
- C) Carbon dioxide**
- D) Argon

15. The term 'syzygy' in astronomy refers to what configuration?

- A) The alignment of three celestial bodies**
- B) The closest approach of a planet to the Sun
- C) The retrograde motion of a planet
- D) The transit of a moon across a sunspot

16. What is the approximate temperature at the center of the Sun's core?

- A) 5,500 Kelvin
- B) 1 million Kelvin
- C) 15 million Kelvin**
- D) 100 million Kelvin

17. Which pulsar was the first to be discovered, identified by Jocelyn Bell Burnell in 1967?

- A) Crab Pulsar
- B) Vela Pulsar
- C) PSR B1919+21**
- D) Geminga

18. What is the largest known structure in the universe, a massive galaxy filament?

- A) The Great Wall
- B) The Hercules-Corona Borealis Great Wall**
- C) The Boötes Void
- D) The Shapley Supercluster