

Advanced Astronomical Knowledge

Astronomy · Practice Test · 20 Questions

1. Which celestial body marks the center of the Milky Way galaxy, currently understood by astronomers as a supermassive black hole?

- A) Sagittarius A*
- B) Cygnus X-1
- C) Andromeda
- D) Centaurus A

2. What is the specific classification of the Hertzsprung-Russell diagram sequence where 90% of stars, including the Sun, reside?

- A) Giant branch
- B) White dwarf sequence
- C) Main sequence
- D) Supergiant branch

3. The 'Chandrasekhar limit' defines the maximum mass that a stable white dwarf star can possess, approximately equal to how many solar masses?

- A) 0.5
- B) 1.4
- C) 3.2
- D) 5.0

4. Which astronomical phenomenon describes the apparent shift in the position of a nearby star against the background of distant objects due to Earth's orbit?

- A) Precession
- B) Stellar parallax
- C) Aberration of light
- D) Proper motion

5. What is the approximate age of the universe according to current cosmological models based on the cosmic microwave background radiation?

- A) 4.5 billion years
- B) 13.8 billion years
- C) 20.5 billion years
- D) 50 billion years

6. Which layer of the Sun is considered the visible surface, from which most of the light we observe originates?

- A) Corona
- B) Chromosphere
- C) Photosphere
- D) Convection zone

7. In orbital mechanics, what does the 'Roche limit' define?

- A) The escape velocity of a planet
- B) The distance within which a celestial body will disintegrate due to tidal forces
- C) The limit of light speed in a vacuum
- D) The boundary of a black hole's event horizon

8. Which chemical element is the primary product of stellar nucleosynthesis during the main sequence stage of a star's life?

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

9. What is the term for a massive, extremely luminous active galactic nucleus powered by a supermassive black hole at the center of a galaxy?

- A) Pulsar
- B) Quasar
- C) Magnetar
- D) Protostar

10. What is the primary constituent of the gas giant planets Jupiter and Saturn?

- A) Oxygen and Nitrogen
- B) Hydrogen and Helium
- C) Carbon dioxide and Methane
- D) Iron and Nickel

11. The 'Great Red Spot' on Jupiter is best described as which of the following?

- A) A massive volcanic eruption
- B) A long-lived high-pressure storm system
- C) A solid surface feature
- D) An impact crater

12. What defines the 'Event Horizon' of a black hole?

- A) The point where light can no longer escape
- B) The physical surface of the singularity
- C) The outer atmosphere of the black hole
- D) The temperature of the accretion disk

13. Which moon of Saturn is famous for having a thick, nitrogen-rich atmosphere and liquid methane lakes?

- A) Enceladus
- B) Titan
- C) Mimas
- D) Iapetus

14. What is the speed of light in a vacuum, rounded to the nearest integer in meters per second?

- A) 299,792,458
- B) 150,000,000
- C) 300,000,000
- D) 250,000,000

15. What do astronomers call the hypothetical form of matter that does not emit, absorb, or reflect light, but exerts gravitational effects?

- A) Antimatter
- B) Dark matter
- C) Baryonic matter
- D) Degenerate matter

16. Which galaxy is the largest member of the 'Local Group' to which the Milky Way belongs?

- A) Triangulum Galaxy
- B) Andromeda Galaxy
- C) Magellanic Cloud
- D) Sombrero Galaxy

17. In the context of stellar evolution, what is the final state of a star with a mass similar to that of our Sun?

- A) Supernova
- B) Black hole
- C) White dwarf
- D) Neutron star

18. Which force is primarily responsible for the formation of stars and planets from interstellar clouds of gas and dust?

- A) Electromagnetism
- B) Strong nuclear force
- C) Gravity
- D) Weak nuclear force

19. The cosmic microwave background radiation is considered the 'afterglow' of which event?

- A) The Big Bang
- B) The formation of the first stars
- C) The collision of galaxies
- D) The supernova of a nearby star

20. What is the unit of distance equal to the distance light travels in one Julian year?

- A) Astronomical Unit
- B) Parsec
- C) Light-year
- D) Angstrom