

Astronomy Question Bank 2 – 2018 - 2019

Student Name :

1. Which of the following has your "cosmic address" in the correct order?
 - A. You, solar system, Earth, Milky Way Galaxy, universe
 - B. You, Earth, solar system, universe, Milky Way Galaxy
 - C. You, Earth, solar system, Milky Way Galaxy, universe
 - D. You, Earth, Milky Way Galaxy, universe, solar system
 - E. You, universe, Earth, solar system, Milky Way Galaxy

2. When we look at an object that is 1,000 light-years away we see it _____.
 - A. As it was 1,000 years ago
 - B. Looking just the same as our ancestors would have seen it 1,000 years ago
 - C. As it is right now, but it appears 1,000 times dimmer
 - D. As it was 1,000 light-years ago

3. You observe a full moon rising at sunset. What will you see one day later?
 - A. A waning gibbous moon
 - B. A waxing gibbous moon
 - C. A full moon on or near your meridian
 - D. A third quarter moon

4. In the formula $E=mc^2$, what does E represent?
 - A. The radiative energy carried by light
 - B. The kinetic energy of a moving object
 - C. The electric field produced by a charge
 - D. The gravitational potential energy of an object held above the ground
 - E. The mass-energy, or potential energy stored in an object's mass

5. Which of the following scenarios involves energy that we would typically calculate with Einstein's formula $E=mc^2$?
 - A. An object accelerated to a great speed has a lot of kinetic energy.
 - B. A mass raised to a great height has a lot of gravitational potential energy.
 - C. When hydrogen is fused into helium, whether in the Sun or a nuclear bomb, some of the mass disappears and becomes energy.
 - D. A burning piece of wood produces light and heat, therefore giving off radiative and thermal energy.

6. The Chandra X-ray Observatory must operate in space because:
 - A. It was built by NASA.
 - B. X-ray telescopes require the use of grazing incidence mirrors.
 - C. X rays do not penetrate Earth's atmosphere.
 - D. X rays are too dangerous to be allowed on the ground.

7. Suppose you view the solar system from high above Earth's North Pole. Which of the following statements about planetary orbits will be true?
 - A. All the planets except Uranus orbit the Sun counterclockwise; Uranus orbits in the opposite direction.
 - B. All the planets orbit counterclockwise around the Sun.
 - C. The inner planets orbit the Sun counterclockwise while the outer planets orbit the Sun clockwise.
 - D. The inner planets orbit the Sun clockwise while the outer planets orbit the Sun counterclockwise.

8. Which of the following statements about our Sun is NOT true?

- A. Its diameter is about 5 times that of Earth.
- B. It is a star.
- C. It is made mostly of hydrogen and helium.
- D. It contains more than 99% of all the mass in our solar system.

9. From center to surface, which of the following correctly lists the interior layers of the Sun?

- A. core, convective zone, radioactive zone, photosphere
- B. photosphere, convective zone, radioactive zone, core
- C. radioactive zone, Core convective zone, photosphere
- D. core, radioactive zone, convective zone, photosphere

10. What is a magnetosphere?

- A. The region in a planet's atmosphere where aurorae occur
- B. The uppermost layer of any planetary atmosphere
- C. A region of space around a planet in which the planet's magnetic field can trap charged particles
- D. The layer of a planet in which its magnetic field is generated

11. A rock found on Earth that crashed down from space is called _____.

- A. An asteroid
- B. A meteor
- C. A meteorite
- D. An impact

12. The asteroid belt is located _____.

- A. Beyond the orbit of Neptune
- B. Between the orbits of Earth and Mars
- C. Between the orbits of Jupiter and Saturn
- D. Between the orbits of Mars and Jupiter

13. Which direction do a comet's dust and plasma tails point?

- A. Perpendicular to the ecliptic plane
- B. Straight behind the comet in its orbit
- C. Generally away from the Sun
- D. Always almost due north

14. When a comet passes near the Sun, part of it takes on the appearance of a large, bright ball from which the tail extends. This part is called _____.

- A. The Oort core
- B. The plasma tail
- C. The nucleus
- D. The coma

15. Suppose there were no solar wind. How would the appearance of a comet in our inner solar system be different?

- A. It would have only one tail instead of two.
- B. It would be much brighter in appearance.
- C. It would not have a nucleus.
- D. It would not have a coma.

16. When we say that the Sun is a ball of plasma, we mean that _____.

- A. The Sun is made of atoms and molecules
- B. The Sun is made of material that acts like a liquid acts on Earth
- C. The Sun consists of gas in which many or most of the atoms are ionized (missing electrons)
- D. The Sun is roughly the same color as blood

17. What two physical processes balance each other to create the condition known as gravitational equilibrium in stars?
A. The gravitational force and outward pressure
B. The strong force and the electromagnetic force
C. The strong force and the weak force
D. The gravitational force and surface tension
18. The source of energy that keeps the Sun shining today is _____.
A. Gravitational contraction B. Chemical reactions C. Nuclear fission D. Nuclear fusion
19. What is the Sun made of (by mass)?
A. 100% hydrogen and helium
B. 50% hydrogen, 25% helium, 25% other elements
C. 90% dark matter, 10% ordinary matter
D. 70% hydrogen, 28% helium, 2% other elements
20. To estimate the central temperature of the Sun, scientists _____.
A. Send probes to measure the temperature
B. Monitor changes in Earth's atmosphere
C. Use computer models to predict interior conditions
D. Create a version of the Sun in a laboratory
21. The Sun's surface, as we see it with our eyes, is called the _____.
A. Core B. Photosphere C. Corona D. Chromosphere
22. What is the solar wind?
A. It is the strong winds that blow across the surface of the Sun, causing sunspots to move around randomly.
B. It is the wind that causes huge arcs of gas to rise above the Sun's surface, sometimes staying aloft for weeks.
C. It is the name we give to the gas (or plasma) particles flowing outward from the surface of the Sun into the solar system.
D. It is the uppermost layer of the Sun, lying just above the corona.
23. The fundamental nuclear reaction occurring in the core of the Sun is _____.
A. Nuclear fusion of helium to carbon B. Radioactive decay
C. Nuclear fusion of hydrogen to helium D. Nuclear fission
24. What happens to energy in the Sun's convection zone?
A. Energy is produced in the convection zone by thermal radiation.
B. Energy is transported outward by the rising of hot plasma and sinking of cooler plasma.
C. Energy is produced in the convection zone by nuclear fusion.
D. Energy slowly leaks outward through the radiative diffusion of photons that repeatedly bounce off ions and electrons.
25. What do sunspots, solar prominences, and solar flares all have in common?
A. They are all shaped by the solar wind.
B. They are all strongly influenced by magnetic fields on the Sun.
C. They all occur only in the Sun's photosphere.
D. They all have about the same temperature.
26. How does the Sun's mass compare to Earth's mass?
A. The Sun's mass is about 300 times the mass of the Earth.
B. The Sun's mass is about 300,000 times the mass of the Earth.
C. The Sun's mass is about 30 times the mass of the Earth.
D. Both have approximately the same mass.

27. The Sun's average surface (photosphere) temperature is about _____.
 A. 5,600 °C B. 37,000 °C C. 1,000,000 °C D. 1,000 °C
28. Every second, the Sun converts 600 million tons of hydrogen into 596 million tons of helium. The remaining 4 million tons _____.
 A. Are converted to an amount of energy equal to 4 million tons times the speed of light squared
 B. Are ejected into space in a solar wind
 C. Are reabsorbed as molecular hydrogen
 D. Are ejected into space by solar flares
29. What is the approximate chemical composition (by mass) with which all stars are born?
 A. 98% hydrogen, 2% helium
 B. Three quarters hydrogen, one quarter helium, no more than 2% heavier elements
 C. Half hydrogen and half helium
 D. 95% hydrogen, 4% helium, no more than 1% heavier elements
30. What is a white dwarf?
 A. It is a main sequence star of spectral type F, which tends to look white in color.
 B. It is the remains of a star, composed mostly of carbon, that no longer produces energy by nuclear fusion
 C. It is a star that follows a period-luminosity relation
 D. It is a type of star that produces energy by gravitational contraction.
31. The most massive part of the atom is (are) the _____ which has (have) a _____ charge
 A. Electrons, negative B. Nucleus, negative C. Nucleus, positive D. Electrons, positive
32. Which of the following is the most common type of star?
 A. White dwarfs B. Red giants C. Main Sequence D. Supergiants
33. The nuclear fusion reactions that power a star occur in
 A. the corona B. the central core C. radiative region D. convectional region
34. What is a star?
 A. A tiny cold ball of gas
 B. A huge, hot, bright ball of gas that are trillions of kilometers from Earth
 C. A tiny, hot ball of gas that is close to earth.
 D. A huge cold ball of gas
35. Scientists consider red stars to be
 A. Hot B. Cool C. Large D. Small
36. Sun spots appear in the,
 A. Photosphere B. Chromosphere C. Solar corona D. Core
37. Magnetic fields in a sunspot is,
 A. the same as the rest of the sun B. weaker than the rest of the sun
 C. stronger than the rest of the sun D. weaker than the Earth's magnetic field.
38. What do we call an object that is in orbit around a planet?
 A. a star B. a satellite C. a comet D. an asteroid
39. Which is the third planet from the Sun?
 A. Mars B. Venus C. Earth D. Mercury

40. Which force keeps the planets in orbit?

- A. friction B. electromagnetic C. tension **D. gravity**

41. The orbits of the planets are:

- A. perfect circles **B. slightly squashed circles** C. spheres D. squares

42. The further away from the Sun:

- A. the faster the planet moves. **B. the slower the planet moves.**
C. the longer the planet's orbit takes. D. the hotter the planet is.

43. Why is a day on Mars about 37 minutes longer than a day on Earth?

- A. Watches on the Mars don't keep very good time.
B. Mars spins more slowly on its axis than Earth does.
C. Mars spins faster on its axis than Earth does.
D. Mars has less magnetic field than Earth has.

44. In which direction does the Earth spin?


- A. from east to west B. from north to south
C. from South to North **D. from west to east**

45. Why do we have seasons on Earth?

- A. the Earth has magnetic field B. the Sun is brighter in summer than it is in winter.
C. the Earth's axis is tilted D. the Earth is closer to the Sun in summer than it is in winter.

46. At midday in summer in the Northern hemisphere, the Sun can be seen in the south. Where would you see the Sun at midday in the winter?

- A. in the north B. in the south but higher in the sky
C. in the south but lower in the sky D. in the east.

47. Which phase of the Moon is this? 

- A. waning gibbous B. full Moon C. new Moon **D. crescent Moon**