

Astronomy Question Bank 1

Chapter 1 and 2

Student Name :

1. The number of stars in the Milky Way Galaxy is approximately _____.

- A. A few hundred billion
- B. A few hundred
- C. A few hundred million
- D. A few hundred thousand

2. An astronomical unit (AU) is _____.

- A. The average distance between any two planets
- B. The average distance between the Sun and Pluto
- C. The average distance between the Sun and Earth
- D. Any very large unit, such as a light-year

3. What is the ecliptic plane?

- A. The plane of the Milky Way Galaxy
- B. The plane of the Earth's orbit around the Sun
- C. The plane of the Sun's equator
- D. The plane of the Earth's equator

4. What is the ecliptic?

- A. The path the Sun appears to trace around the celestial sphere each year
- B. The path on the Earth traced by the Moon's shadow during a solar eclipse
- C. The Sun's daily path from east to west in our sky
- D. A half-circle extending from your horizon due north, through your zenith, to your horizon due South

5. What is the celestial sphere?

A. The celestial sphere is a model that shows the true locations of the Sun and a few thousand of the nearest stars.

B. It is a model of how the stars are arranged in the sky relative to our Sun, which is in the middle of the sphere.

C. It represents a belief in an Earth-centered universe, and hence is no longer considered to have any use.

D. The celestial sphere is a representation of how the sky looks as seen from Earth.

6. The point directly over your head is called _____.

- A. The North Star
- B. The zenith
- C. The meridian
- D. The celestial pole

7. Which of the following best describes why we have seasons on Earth?

A. The varying speed of the Earth in its orbit around the Sun gives us summer when we are moving fastest and winter when we are moving slowest.

B. The varying speed of the Earth in its orbit around the Sun gives us summer when we are moving fastest and winter when we are moving slowest.

C. The tilt of the Earth's axis causes different portions of the Earth to receive more or less direct sunlight at different times of year.

D. The varying speed of the Earth in its orbit around the Sun gives us summer when we are moving fastest and winter when we are moving slowest.

8. Each part below describes how a few astronomical phenomena are related to time periods. Which list is correct? (Careful: some lists are partially correct.)

A. The Earth's rotation defines a day. The cycle of the Moon's phases takes about a month. The Earth's orbit defines a year. The Earth's cycle of axis precession takes 26,000 years.

B. The Earth's rotation defines a day. The saros cycle of eclipses defines a month. The Earth's orbit defines a year. The Earth's cycle of axis precession takes 26,000 years.

C. The Earth's rotation defines a day. The Sun's rotation defines a week. The Moon's rotation defines a month. The Earth's orbit defines a year.

D. The Earth's rotation defines a day. The cycle of the Moon's phases takes about a week. The Earth's orbit defines a year. The Earth's cycle of axis precession defines a month.

9. If we have a new moon today, when we will have the next full moon?

- A. In about a month
- B. In about 1 week
- C. In about 2 weeks
- D. In about 6 months

10. We cannot see a new moon in our sky because _____.

- A. It is above the horizon during the daytime
- B. No sunlight is illuminating the Moon
- C. A new moon is quite near the Sun in the sky
- D. It is obscured by the Earth's shadow

11. Lunar eclipses can occur only during a _____.
- A. Full moon
 - B. First quarter moon
 - C. Third quarter moon
 - D. New moon
12. Which of the following statements about the celestial sphere is NOT true?
- A. The "celestial sphere" is just another name for our universe.
 - B. When we look in the sky, the stars all appear to be located on the celestial sphere.
 - C. The celestial sphere does not exist physically.
 - D. The Earth is placed at the center of the celestial sphere.
13. The Sun's path, as viewed from the equator, is highest on _____.
- A. The day when Earth is closest to the Sun
 - B. The spring and fall equinoxes
 - C. The winter solstice
 - D. The summer solstice
14. Suppose Earth's axis tilt was significantly greater than its current 23.5 degrees, but Earth's rotation period and orbital period were unchanged. Which statement below would NOT be true?
- A. The length of each season (for example, the number of days from the summer solstice to the fall equinox) would be significantly longer than it is now.
 - B. The region of the Earth where the Sun never rises on the summer solstice would be larger (extending farther south) than it is now.
 - C. Polaris would not be our North star.
 - D. Summers and winters would be more severe (for example, hotter and colder, respectively) than they are now.
15. How does the Earth's varying distance from the Sun affect our seasons?
- A. It is responsible for the fact that the seasons are opposite in the Northern and Southern hemispheres.
 - B. It doesn't --- Earth's orbital distance plays no obvious role in the seasons.
 - C. It makes summer warmer in the Northern Hemisphere than in the Southern Hemisphere.
 - D. It causes the seasons to be more extreme than they would be if the Earth's distance from the Sun were always the same.

16. Suppose you live in the United States and you see a crescent moon in your evening sky tonight. What will a friend in South America see tonight?

- A. Your friend will see a gibbous moon.
- B. Your friend will also see a crescent moon.
- C. Your friend will see a first quarter moon.
- D. Your friend won't see the Moon tonight, because it is up only in the morning.

17. Suppose it is full moon. What phase of the Earth would someone on the Moon see at this time?

- A. The Earth does not go through phases as seen from the Moon.
- B. New Earth
- C. First quarter Earth
- D. Full Earth

18. All of the following statements are true. Which one explains the reason that there is NOT a solar eclipse at every new moon?

- A. The Moon goes through a complete cycle of phases about every 29 1/2 days.
- B. The nodes of the moon's orbit precess with an 18-year period.
- C. The orbital plane of the Moon is tilted slightly (by about 5 degrees) to the ecliptic plane.
- D. The Moon is only about 1/4 as large as Earth in diameter.

19. What practical value did astronomy offer to ancient civilizations?

A. It helped them keep track of time and seasons, and it was used by some cultures for navigation.

- B. It allowed them to predict eclipses with great accuracy.
- C. It helped them understand our cosmic origins.
- D. It helped them find uses for ancient structures like Stonehenge.

20. Scientific thinking is _____.

- A. An ancient mode of thinking first invented in Egypt
- B. Completely different from any other type of thinking
- C. Based on everyday ideas of observation and trial-and-error experiments
- D. A difficult process that only a handful of people can do well

21. Ptolemy was important in the history of astronomy because he _____.

A. Was the first to create a model of the solar system that placed the Sun rather than the Earth at the center

- B. Was the first to believe that all orbits are perfect circles
- C. Developed the first scientific model of the universe

D. Developed a model of the solar system that made sufficiently accurate predictions of planetary positions to remain in use for many centuries

22. The great contribution of Nicholas Copernicus was to _____.
- A. Prove that the Earth is not the center of the universe
 - B. Discover the law of gravity
 - C. Create a detailed model of our solar system with the Sun rather than Earth at the center
 - D. Discover the laws of planetary motion
23. Which of the following statements about an ellipse is NOT true?
- A. The focus of an ellipse is always located precisely at the center of the ellipse.
 - B. The semimajor axis of an ellipse is half the length of the longest line that you can draw across an ellipse.
 - C. An ellipse with a large eccentricity looks much more elongated (stretched out) than an ellipse with a small eccentricity.
 - D. A circle is considered to be a special type of ellipse.
24. Which of the following is not one of, nor a direct consequence of, Kepler's Laws?
- A. More distant planets orbit the Sun at slower speeds.
 - B. The orbit of each planet about the Sun is an ellipse with the Sun at one focus.
 - C. The force of attraction between any two objects decreases with the square of the distance between their centers.
 - D. As a planet moves around its orbit, it sweeps out equal areas in equal times.
 - E. A planet or comet in a noncircular orbit travels faster when it is nearer to the Sun and slower when it is farther from the Sun.
25. Earth is farthest from the Sun in July and closest to the Sun in January. During which Northern Hemisphere season is Earth moving fastest in its orbit?
- A. Winter
 - B. Spring
 - C. Fall
 - D. Summer
26. According to Kepler's third law ($p^2 = a^3$), how does a planet's mass affect its orbit around the Sun?
- A. More massive planets must have more circular orbits.
 - B. A planet's mass has no effect on its orbit around the Sun.
 - C. A more massive planet must have a larger semimajor axis.
 - D. More massive planets orbit the Sun at higher average speed.

27. According to the universal law of gravitation, if you triple the distance between two objects, then the gravitational force between them _____.

- A. Increases by a factor of 9
- B. Decreases by a factor of 9
- C. Decreases by a factor of 3
- D. Increases by a factor of 3

28. Why is Newton's version of Kepler's third law so useful to astronomers?

- A. It allows us to calculate distances to distant objects.
- B. It explains why objects spin faster when they shrink in size.
- C. It can be used to determine the masses of many distant objects.
- D. It tells us that more-distant planets orbit the Sun more slowly.

29. A planet moves fastest in its orbit

- A. when it is in opposition.
- B. when it is closest to the Sun.
- C. The greater its mass.
- D. When it is farthest from the Sun
- E. The closer it is to its satellites.

30. Which of the following is the smallest?

- A. The Earth
- B. The Universe
- C. A galaxy
- D. The Sun

31. One side of the Moon always faces the Earth because the

- A. Rotation rate about the Sun equals the revolution rate
- B. Moon does not spin on its axis.
- C. Revolution rate about the Earth equals the rotation rate.
- D. Earth always has the same side facing the Moon.

32. The distance between the Earth and the Sun is called:

- A. a kilometer
- B. an astronomical unit
- C. a parsec
- D. a lightyear

33. If our year were twice as long (that is, if Earth took twice as many days to complete each orbit around the Sun),but Earth's rotation period and axis tilt were unchanged, then _____.

- A. The four seasons would each be twice as long as they are now
- B. The cycle of precession would take 13,000 years instead of 26,000 years
- C. The Earth would not have seasons
- D. Stars would take twice as long to rise and set

34. The discovery that planets move in elliptical orbits with the Sun at the focus was made by

- A. Halley
- B. Giordano Bruno
- C. Tycho Brahe
- D. Kepler
- E. Galileo

35. Total solar eclipses, when they occur, are visible from

- A. a narrow path on the Earth
- B. Any place on the Earth.
- C. Any place on the Earth where the Sun is visible
- D. any place on Earth where the Sun and Moon are visible

36. Darkest part of shadow of moon or Earth.

- A. Umbra
- B. Penumbra

37. The part of a shadow that is only partly illuminated; partial shadow.

- A. Umbra
- B. Penumbra

38. The only planet in the Solar System that is capable of sustaining life is _the Earth_____.

39. An eclipse that occurs when the moon passes into Earth's total shadow, or umbra.

- A. Lunar Eclipse
- B. Solar Eclipse

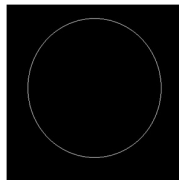
40. An eclipse that occurs when the moon's total shadow, or umbra, falls on Earth.

- A. Solar Eclipse
- B. Lunar Eclipse

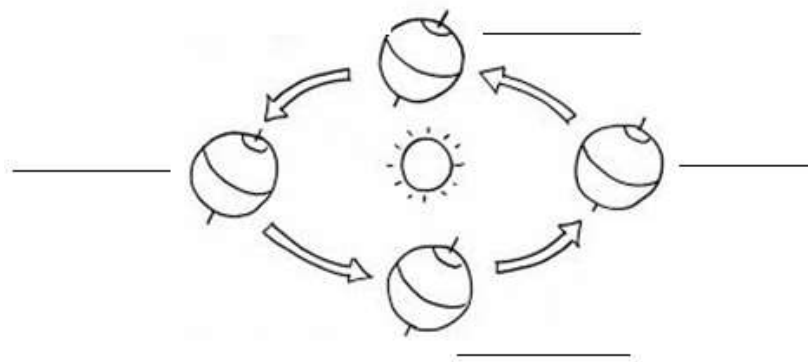
41. Write down the phases of the moon.



42. Write down the phases of the moon.



43. Show the equinoxes and solstices, and their dates below.



44. Show zenith, equinoxes and solstice in the figure below.

