

Midterm Test 1

Circle the letter next to your choice of answer for each multiple-choice question (do not write the letter next to the question).

(1) If you watched the sky for several hours one night, which of these stars would not change position?

- a. Sirius.
- b. Polaris.
- c. Alpha Centauri.
- d. None, they would all change position over time.

(2) Ancient astronomers tried hard, but failed to see a yearly parallax for:

- a. The Sun.
- b. The Moon.
- c. The planet Mars.
- d. The stars.

(3) Why does light produce diffraction?

- a. Because it is made of waves.
- b. Because it is made of particles.
- c. Because it contains different colors.
- d. Because of the composition of the Earth's atmosphere.

(4) What is an emission line spectrum?

- a. One produced by a very thin hot solid object like a wire.
- b. One whose spectrum is a single long line containing all colors.
- c. One that only contains light of a few specific colors or wavelengths.
- d. One produced by an object that is moving along a line.

(5) Which of the following statements is correct?

- a. The Milky Way galaxy is the name of a small cloud of gas inside the Solar System.
- b. The Milky Way galaxy is very far from our Solar System, in a different part of the universe.
- c. The Solar System is near the center of the universe, and the Milky Way galaxy is near the edge.
- d. The Solar System is a small part of the Milky Way galaxy, which is a small part of the universe.

(6) Do stars move?

- a. They move in our local sky because the Earth rotates, but on the celestial sphere they essentially don't.
- b. They constantly move from East to West in our local sky, and from West to East on the celestial sphere.
- c. Yes, their motion depends on where they are along their orbit; right now they are all in retrograde motion.
- d. No, stars are always in the same position in the sky; only planets, the Moon and the Sun move.

(7) Why is Ptolemy important in the history of Astronomy?

- a. He proposed more than 2000 years ago that the Earth revolves around the Sun.
- b. He was the first person who counted all the stars in the sky.
- c. He developed a very detailed and successful geocentric model of the solar system.
- d. He was the first person who understood the force of gravity.

(8) Around what time did Copernicus and Tycho Brahe live?

- a. The 5th century BC.
- b. The 2nd century AD.
- c. The 1500s.
- d. The 1800s.

(9) What happens inside an atom when it absorbs a photon?

- a. An electron jumps from a lower energy state to a higher one.
- b. One more electron is added to the atom.
- c. All electrons start moving faster along their orbits.
- d. The nucleus becomes hotter and expands.

- (10) Most ancient astronomers believed in a geocentric model of
- The Solar System.
 - The universe.
 - Both of the above.
 - None of the above.
- (11) When is a planet's motion called retrograde?
- When it rotates backward around its axis.
 - When it drifts gradually Westward on the celestial sphere.
 - When it is moving away from the Earth.
 - When it rises in the West and sets in the East in one night.
- (12) What point of view did ancient Greeks contribute to astronomy?
- The need to use it to predict seasonal changes.
 - The need to represent astronomical objects in their art.
 - The need to interpret the meaning of events such as eclipses.
 - The need to model the solar system, in order to understand it.
- (13) Do we believe in Ptolemy's model for the solar system today?
- Yes, we have only improved it in a few details.
 - No, because it is too old.
 - No, because Ptolemy has been proven to be a fraud.
 - No, because the model is geocentric.
- (14) What kinds of particles are atoms made of?
- Ions, neutrons, and molecules.
 - Protons, neutrons, and electrons.
 - Ions, neutrons, and electrons.
 - Protons, neutrons, and molecules.
- (15) Why is the sky blue during the day?
- Because we are facing a part of space that is bluer than the rest.
 - Because blue sunlight is scattered around us by the Earth's atmosphere.
 - Because the Earth's surface is warmer than at night and it emits blue light.
 - Because the Sun lights up all of space and we can see much further than at night.
- (16) Why do we see different phases of the Moon on different days?
- Because as the Moon rotates we see different parts of its surface.
 - Because the Moon is at different points along its orbit around the Earth.
 - Because as the Earth rotates we face different parts of the Moon.
 - Because the Earth casts different shadows on the surface of the Moon.
- (17) Where do the names for the seven days of the week come from?
- Seven important people in the Bible.
 - Seven important people in the Koran.
 - The Sun, Moon, and the planets known in antiquity.
 - The seven visible stars in the Pleiades cluster.
- (18) What kind of telescope did Tycho Brahe use?
- He did not have a telescope.
 - A refracting telescope.
 - A reflecting telescope.
 - A diffracting telescope.
- (19) What is the difference between mass and weight?
- None, they are two different words for the same thing.
 - A body can lose weight on Earth, but its mass can only change in outer space.
 - A body's mass is always the same, its weight depends on the force of gravity.
 - Mass depends on the volume of an object, weight depends also on its shape.
- (20) The point directly overhead in the sky is called
- Right ascension.
 - Zenith.
 - Ecliptic.
 - Meridian.

(21) Suppose that the Moon is new today. How long will it be until full Moon?

- a. The length of time varies because of the tilt of the Moon's orbit.
- b. About 2 days.
- c. About 2 weeks.
- d. About 2 months.

(22) If you see a star rising on the horizon at 9:00 pm today, at what time will it rise tomorrow?

- a. 8:00 pm.
- b. 8:56 pm.
- c. 9:00 pm.
- d. 9:23 pm.

(23) Which of these was already known before the 1600s?

- a. Saturn.
- b. Uranus.
- c. Neptune.
- d. Pluto.

(24) Do we consider Kepler's laws for the solar system to be correct?

- a. Basically yes. Except for small corrections those laws have passed all tests.
- b. No, because those laws do not follow the teaching of Aristotle.
- c. No, because Kepler in part used guesswork to arrive at those laws.
- d. No, because the model he proposed is geocentric.

(25) What is an arcminute?

- a. The distance a star covers in the sky in one minute.
- b. One minute of time, as measured with a solar clock.
- c. A very small angle, equal to 1/60-th of a degree.
- d. The angle by which the Earth turns in one minute.

(26) On a day when the Moon is in its third quarter, at what time will it be highest in the sky?

- a. In the evening, around sunset.
- b. Late at night, around midnight.
- c. In the early morning, around sunrise.
- d. The answer depends on the time of year.

(27) How can you approximately tell the time at night by looking at the Moon?

- a. The position of the Moon by itself tells you the time, because the Moon is always high at the same time.
- b. You can tell by looking at the color of the Moon, which changes throughout the day and night.
- c. If you see what phase the Moon is in, you will know when it rises, when it is high up, and when it sets.
- d. The phase of the Moon changes throughout the day and night, and it tells you what time it is.

(28) What is an epicycle?

- a. A full cycle of seasons for a planet in the Solar System.
- b. A smaller circle added to a planet's main circular orbit in old models.
- c. The center of the circle along which a planet moves around the Sun.
- d. The point in the sky at which a planet reverses its direction of motion.

(29) What important fact did Galileo discover about Jupiter?

- a. He discovered that Jupiter is a planet, not a star.
- b. He saw that Jupiter has rings around it like Saturn.
- c. He saw that Jupiter has moons orbiting around it.
- d. He saw that there are craters on Jupiter's surface.

(30) Why do stars "twinkle"?

- a. Because they are burning spheres of hot gas.
- b. Because of their slow motion across the sky.
- c. Because of the scattering of starlight caused by Earth's atmosphere.
- d. Because sometimes one of their planets passes in front of them.

(31) What is the Zodiac?

- a. The set of constellations that are located along the celestial equator.
- b. The set of constellations that are located along the ecliptic.
- c. The point straight above our head in the sky at a given time.
- d. The point on the celestial sphere above the Earth's north pole.

(32) According to Newton's theory, gravity acts

- a. Only between stars and objects revolving around them.
- b. Between stars or planets and objects in orbit around them or on their surface.
- c. Between stars, planets or their moons and objects in orbit or on their surface.
- d. Between any two objects that have a mass, regardless of their size or nature.

(33) According to Aristotle's ideas, an object sliding on a surface eventually slows down and stops because

- a. All objects naturally do that, unless a force keeps pushing them forward and forces them to move.
- b. Friction with the surface slows it down, otherwise it would keep moving at the same speed.
- c. Because motion always uses up energy; inertia eventually takes over and stops the object.
- d. Moving objects always end up hitting a wall or some other obstacle sooner or later.

(34) According to Galileo and Newton, an object sliding on a surface eventually slows down and stops because

- a. All objects naturally do that, unless a force keeps pushing them forward and forces them to move.
- b. Friction with the surface slows it down, otherwise it would keep moving at the same speed.
- c. Because motion always uses up energy; inertia eventually takes over and stops the object.
- d. Moving objects always end up hitting a wall or some other obstacle sooner or later.

(35) Which one of these planets cannot be seen with the naked eye?

- a. Mercury.
- b. Venus.
- c. Saturn.
- d. Neptune.

(36) When a lunar eclipse occurs, what phase does the Moon have to be in?

- a. It could be any phase, depending on the time of day when it happens.
- b. First quarter.
- c. New Moon.
- d. Full Moon.

(37) Why is Newton important in the history of astronomy?

- a. He made excellent observations of the planets' positions.
- b. He developed the heliocentric model of the solar system we still use.
- c. He explained the orbits of planets in terms of gravity.
- d. He was the first person to use a telescope to make astronomical observations.

(38) As a planet revolves around the Sun, does the Sun also move?

- a. No, because in this case the Sun is the center of attraction.
- b. Yes, the Sun feels the same force but it is so massive that it moves much less.
- c. Yes, the Sun feels the same force, and it moves as much as the planet does.
- d. Maybe, but there is no way for us to find out because the Earth itself is moving.

(39) What causes high and low tides along the coasts of Earth's oceans?

- a. The Earth's revolution around the Sun.
- b. The gravitational attraction by the Moon.
- c. The apparent retrograde motion of Mars.
- d. The fact that the Earth's axis is tilted.

(40) What is the celestial sphere?

- a. An imaginary surface around the Earth used for locating stars and planets.
- b. The sphere on which the Earth and planets move as they orbit the Sun.
- c. The blue globe of the Earth, as it appears when viewed from space.
- d. A sphere that separates the stars in our galaxy from other ones.