Question 19:

Score: 0.00

From what location on Earth are no constellations circumpolar?

a. North Pole

b. South Pole

✓ c. equator

d. Nowhere on Earth is this possible.

✗ e. both North and South Poles

Correct Answer:
c

Question 4:

Score: 1.00

Which of the following is an asterism?

a. Andromeda

b. Orion

c. Pegasus

d. Sagittarius

✓ e. the Big Dipper

Status: Correct

Question 21:

Score: 0.00

You observe that the north celestial pole is 42 degrees above the horizon. What does this information tell you?

a. that your longitude is 42 degrees west

b. that your longitude is 42 degrees east

✓ c. that your latitude is 42 degrees north

d. that your latitude is 42 degrees south

✗ e. either c or d above

Correct Answer:
c

Status: Incorrect

Question 7:

Score: 1.00

How many apparent brightness classes did Hipparchus assign to stars?

a. 3

b. 4

c. 5

✓ d. 6

e. 100

Status: Correct

Question 9:

Score: 1.00

What is the faintest apparent magnitude that can be detected by the human eye on a clear, very dark night?

a. 3

b. 4

c. 5

✓ d. 6

e. 100

Status: Correct

Question 8:

Score: 1.00

The apparent visual magnitudes of four stars are listed below. Of these four stars, which one appears dimmest in the sky?

a. -0.5

✓ b. +2.8

c. -1.2

d. +0.7

e. It cannot be determined from the given information.

Status: Correct

Question 1:

Score: 1.00

On a clear, very dark night far from city lights, how many stars are visible to the naked human eye?

a. eighty-eight

b. a few hundred

✓ c. a few thousand

d. a few million

e. a few billion

Status: Correct

Question 20:

Score: 1.00

From what location on Earth are all constellations circumpolar?

a. North Pole

b. South Pole

c. equator

d. Nowhere on Earth is this possible.

✓ e. both North and South Poles

Status: Correct

Question 6:

Score: 1.00

What is the most likely Greek-letter name of the second brightest star in the constellation Lyra?

a. alpha Lyrae

✓ b. beta Lyrae

c. gamma Lyrae

d. delta Lyrae

e. epsilon Lyrae

Status: Correct

Question 3:

Score: 1.00

Which statement below most accurately describes modern constellations?

✓ a. They are 88 well-defined regions on the celestial sphere.

b. They are 88 connect-the-dot mythological sky figures.

c. They are 13 connect-the-dot mythological sky figures along the ecliptic.

d. They are 13 well-defined sky regions along the ecliptic.

e. They are 88 groups of stars with members of each group physically close together in space.

Status: Correct

Question 10:

Score: 1.00

The time for one cycle of lunar phases is

a. about one day.

b. about 24.8 hours.

c. about one year.

d. the same as the time for one cycle of the moon relative to the stars.

✓ e. the same as the time for one cycle of the moon relative to the sun.

Status: Correct

Question 5:

Score: 1.00

The five naked eye planets and three telescopic planets that wander among the stars in the sky are always near the

a. horizon.

b. celestial equator.

✓ c. ecliptic.

d. moon.

e. sun.

Status: Correct

Question 9:

Score: 0.00

How does one cycle of the moon's motion relative to the stars compare to one cycle of the moon's motion relative to the sun?

a. The two cycles take the same amount of time.

✓ b. The cycle relative to the stars is shorter than the cycle relative to the sun.

c. The cycle relative to the stars is longer than the cycle relative to the sun.

d. The two cycles vary in length such that at times the star cycle is shorter and at other times the sun cycle is shorter.

✗ e. The moon does not move relative to the sun.

Correct Answer:
b

Question 3:

Score: 0.00

Why is the amount of solar heating less at northern latitudes on a clear day in January than on a clear day in July?

a. The sun is above the horizon for less than 12 hours in January in the north.

b. Earth is farther from the sun in January and closer in July.

c. At low sun angles the received sunlight is spread over a larger surface area.

✗ d. both a and b above

✓ e. both a and c above

Correct Answer:
e

Status: Incorrect

Question 16:

Score: 0.00

Which type of eclipse may be visible to all the people on one side of Earth?

a. an annular eclipse

✗ b. a total solar eclipse

✓ c. a total lunar eclipse

d. none of the above

e. all of the above

Question 24:

Score: 1.00

What is the present relationship between the variation of the Earth–sun distance from the average and the seasons?

a. Earth is closer to the sun in the summer.

✓ b. Earth is 1.7% closer to the sun during northern winters.

c. Earth is 23.5% closer to the sun during northern winters.

d. Earth is 1.7% closer to the sun during northern summers.

e. Earth is 23.5% closer to the sun during northern summers.

Status: Correct

Question 19:

Score: 0.00

A total lunar eclipse occurs when the moon is

a. at new phase.

b. near the ecliptic.

✗ c. at full phase.

d. both a and b above

✓ e. both b and c above

Correct Answer:
e

Status: Incorrect

Question 1:

Score: 1.00

If you could see the sun and stars during the daytime for several weeks you would notice that the sun

a. never moves relative to the stars.

b. moves slowly westward relative to the stars.

✓ c. moves slowly eastward relative to the stars.

d. sometimes moves westward and at other times eastward relative to the stars.

e. rises in the west and sets in the east.

Status: Correct

Question 20:

Score: 0.00

A total solar eclipse occurs when the moon is

a. at new phase.

✗ b. near the ecliptic.

c. at full phase.

✓ d. both a and b above

e. both b and c above

Correct Answer:
d

Status: Incorrect

Which planet is the most difficult to observe as it is always close to the sun in our sky?

✓ a. Mercury

b. Venus

c. Mars

d. Jupiter

e. Saturn

Status: Correct

Question 7:

Score: 0.00

Why did the model of the universe proposed by Copernicus gain support soon after its publication?

a. it more accurately predicted the position of planets.

✗ b. It gave a better explanation for the phases of the moon.

✓ c. It was a more elegant explanation of retrograde motion.

d. The old system of Ptolemy was never very popular.

e. It displaced Earth from the center of the universe.

Correct Answer:
c

Status: Incorrect

Question 11:

Score: 1.00

How did Kepler's first law of planetary motion alter the Copernican system?

a. It changed the perfect circles to ellipses.

b. It added epicycles to the perfect circles.

c. It placed the sun at one focus of each orbit.

✓ d. both a and c above

e. both b and c above

Question 18:

Score: 1.00

Which statement below best describes the difference between your mass and your weight?

a. Your mass is constant and your weight varies throughout your entire life.

✓ b. Your mass is a measure of the amount of matter that you contain and your weight is a measure of the amount of gravitational pull that you experience.

c. Your mass is a measure of your inertia, whereas your weight is a measure of the amount of material you contain.

d. The only difference is the unit used to measure these two physical quantities. Mass is measured in kilograms and weight is measured in pounds.

e. There is no difference between your mass and your weight.

Status: Correct

Question 4:

Score: 0.00

Who first taught that Earth is stationary and at the center of the universe with the sun, the moon, and the planets moving around Earth in perfect circles?

✓ a. Aristotle (384–322 BC)

b. Ptolemy (c. 120 AD)

c. Nicolaus Copernicus (1473–1543)

✗ d. Tycho Brahe (1546–1601)

e. Johannes Kepler (1571–1630)

Correct Answer:
a

Status: Incorrect

According to Newton's laws, how does the amount of gravitational force exerted on Earth by the sun compare to the amount of gravitational force exerted on the sun by Earth?

a. The amount of force exerted on Earth by the sun is greater by the ratio of the sun's mass to Earth's mass.

✗ b. The amount of force exerted on the sun by Earth is negligible.

✓ c. The amount of force exerted on the sun by Earth is the same as the amount of force on Earth by the sun.

d. The amount of force on the Sun by Earth is greater by the ratio of the sun's mass to Earth's mass.

e. It is impossible to compare these two vastly different amounts of force.

Correct Answer:
c

Question 17:

Score: 0.00

What phases of Venus were observed by Galileo?

a. new and crescent phases only

b. quarter and gibbous phases only

✗ c. gibbous and full phases only

d. crescent and gibbous phases only

✓ e. new, crescent, quarter, gibbous, and full phases

Correct Answer:
e

Status: Incorrect

Question 2:

Score: 0.00

How did Claudius Ptolemy account for the retrograde motion of the planets?

a. Planets slow down, stop, and then reverse their orbital direction around the sun.

✗ b. Inner planets orbit the sun faster and pass outer planets as they orbit around the sun.

✓ c. Each planet moves on an epicycle that in turn moves on a deferent that circles around Earth.

d. The sun and moon orbit Earth, whereas all the other planets orbit the sun.

e. none of the above

Correct Answer:
c

Status: Incorrect

Question 1:

Score: 0.00

Plato proposed that all heavenly motion is

a. constantly changing.

b. circular.

✗ c. uniform.

d. both a and b above

✓ e. both b and c above

Correct Answer:
e

Question 5:

Score: 1.00

How did Nicolaus Copernicus account for the retrograde motion of the planets?

a. Planets slow down, stop, and then reverse their orbital direction around the Earth.

✓ b. Inner planets orbit the sun faster and pass outer planets as they orbit around the sun.

c. Each planet moves on an epicycle that in turn moves on a deferent that circles around Earth.

d. The sun and moon orbit Earth, whereas all the other planets orbit the sun.

e. none of the above

Status: Correct

Question 17:

Score: 0.00

Radio telescopes are often connected together to perform interferometry. What is the primary problem overcome by radio interferometry?

a. poor light gathering power

✓ b. poor resolving power

✗ c. poor magnifying power

d. interference from nearby sources of radio waves

e. the low energy of radio photons

Correct Answer:
b

Status: Incorrect

Question 3:

Score: 0.00

Why do the pupils of cat's eyes open wider at night?

a. to reduce the buildup of cat-eye-wax

b. Cats are the only animals besides humans to observe the stars.

✗ c. A cat sleeps all day and is wide awake at night.

✓ d. to increase light gathering power

e. to attract a mate

Correct Answer:
d

Question 8:

Score: 0.00

Which power of a telescope is the least important?

a. light gathering power

✗ b. resolving power

✓ c. magnifying power

d. both a and b above

e. both a and c above

Question 18:

Score: 0.00

Why are near infrared telescopes located on mountaintops, whereas ultraviolet telescopes are placed in Earth's orbit?

a. The primary infrared blocker is located mostly in the lower atmosphere.

✗ b. The primary ultraviolet blocker is located high in the atmosphere far above mountaintops.

c. Ultraviolet telescopes require the low temperature of space to operate.

✓ d. both a and b above

e. both a and c above

Correct Answer:
d

Status: Incorrect

Question 25:

Score: 0.00

Which of the following devices, when attached to a telescope, allows us to extract the greatest amount of information about celestial objects?

✓ a. a spectrograph

✗ b. the human eye

c. a photometer

d. a micrometer

e. a lens cap

Correct Answer:
a

Question 15:

Score: 0.00

What can radio telescopes do that optical telescopes cannot?

a. find the location of cool hydrogen gas

✗ b. see through dust clouds

c. observe many celestial objects during daylight hours

d. both a and b above

✓ e. all of the above

Correct Answer:
e

Question 2:

Score: 0.00

The entire electromagnetic spectrum can be divided into the seven bands of radio, microwave, infrared, visible, ultraviolet, X-ray, and gamma ray (from longest to shortest wavelength). To which of these two bands is Earth's atmosphere the most transparent?

a. X-ray and gamma ray

✗ b. ultraviolet and infrared

c. visible and ultraviolet

d. microwave and radio

✓ e. visible and radio

Correct Answer:
e

Status: Incorrect

Question 21:

Score: 0.00

What is the difference between radio waves and X-rays traveling through a vacuum?

a. X-rays travel faster than radio waves.

b. Radio waves travel faster than X-rays.

✗ c. X-rays have longer wavelengths than radio waves.

✓ d. Radio waves have longer wavelengths than X-rays.

e. both a and d above

Correct Answer:
d

Question 5:

Score: 0.00

Why have no large refracting telescopes been built since 1900?

a. Refracting telescopes suffer from chromatic aberration.

b. Making large glass lenses without interior defects is difficult.

c. Refracting telescopes have several surfaces to shape and polish.

✗ d. Large glass lenses are more difficult to support than large mirrors.

✓ e. all of the above

Correct Answer:
e

Question 22:

Score: 1.00

What prevents most of the incoming ultraviolet radiation from reaching Earth's surface?

a. water vapor (H_2O) molecules in the lower atmosphere

✓ b. ozone (O_3) molecules in the upper atmosphere

c. nitrogen (N_2) molecules in the atmosphere

d. small dust particles suspended in the atmosphere

e. volcanic ash particles suspended in the atmosphere

Status: Correct

Question 14:

Score: 0.00

What conditions produce a dark (absorption line) spectrum?

a. a hot solid, liquid, or high density gas

b. a hot low density gas

✓ c. light from a continuous spectrum source passing through a cooler low density gas

✗ d. both a and b above

e. all of the above

Correct Answer:
c

Question 6:

Score: 0.00

The temperature of a gas is a measure of the

a. total amount of internal energy in the gas.

✗ b. amount of heat that flows out of the gas.

c. total number of atoms in the gas.

d. density of the gas.

✓ e. average speed of its particles.

Correct Answer:
e

Question 18:

Score: 0.00

Of the following spectral types which one represents a star with the highest surface temperature?

a. A

✓ b. B

c. F

✗ d. K

e. G

Correct Answer:
b

Status: Incorrect

Question 5:

Score: 0.00

An atom that is ionized must have

✗ a. more neutrons than protons.

b. more protons than neutrons.

c. more electrons than protons.

d. more protons than electrons.

✓ e. either c or d above

Correct Answer:
e

Question 21:

Score: 0.00

You research the star Sirius and find that its spectral lines are blue shifted. What does this tell you about Sirius?

a. It surface temperature is higher than that of the sun.

b. It has a transverse velocity that is away from us.

✗ c. It has a transverse velocity that is toward us.

d. It has a radial velocity that is away from us.

✓ e. It has a radial velocity that is toward us.

Correct Answer:
e

Question 2:

Score: 0.00

Which of the following is true of an atomic nucleus?

a. It contains more than 99.9% of an atom's mass.

b. It contains all of an atom's positive charge.

✗ c. It contains no electrons.

d. both a and b above

✓ e. all of the above

Correct Answer:
e

Status: Incorrect

Question 9:

Score: 0.00

When an electron absorbs a photon of light, it immediately

a. glows.

✓ b. jumps to a higher energy level.

c. jumps to a lower energy level.

✗ d. both a and b above

e. both a and c above

Correct Answer:
b

Question 4:

Score: 0.00

An electron's binding energy is the energy that

✓ a. holds it to the atom.

b. is needed to move it to the next higher energy level.

✗ c. keeps it from falling into the nucleus.

d. is released when it meets a positron and is annihilated.

e. keeps it from splitting into two half-electrons.

Correct Answer:
a

Status: Incorrect

Question 10:

Score: 1.00

Of the following, which color represents the lowest surface temperature star?

a. yellow

b. blue

c. orange

✓ d. red

e. white

Status: Correct

Question 9:

Score: 1.00

What are the general trends in temperature and density from the photosphere to the chromosphere to the corona?

✓ a. The temperature increases and density decreases.

b. The temperature increases and density increases.

c. The temperature decreases and density decreases.

d. The temperature decreases and density increases.

e. The temperature and density remain constant.

Status: Correct

Question 21:

Score: 0.00

How does the sun maintain its energy output?

a. gravitational contraction

✓ b. fusion of hydrogen nuclei

c. the impact of small meteoroids

✗ d. coal burning in pure oxygen

e. fission of Uranium-235

Correct Answer:
b

Status: Incorrect

Question 1:

Score: 0.00

What fundamental force holds the sun together?

a. electromagnetic

✓ b. gravitational

✗ c. centripetal

d. strong

e. weak

Correct Answer:
b

Status: Incorrect

Question 12:

Score: 0.00

How are astronomers able to explore the layers of the sun below the photosphere?

a. Short-wavelength radar pulses penetrate the photosphere and rebound from deeper layers within the sun.

b. Long-wavelength radar pulses penetrate the photosphere and rebound from deeper layers within the sun.

✗ c. Highly reflective space probes have plunged below the photosphere and sampled the sun's interior.

✓ d. By measuring and modeling the modes of vibration of the sun's surface.

e. By observing solar X-rays and gamma rays with space telescopes. These shorter wavelengths are emitted from hotter regions below the photosphere.

Correct Answer:
d

Question 20:

Score: 0.00

What fundamental force bonds all the protons and neutrons together in an atomic nucleus?

a. electromagnetic

✗ b. gravitational

c. centripetal

✓ d. strong

e. weak

Correct Answer:
d

Status: Incorrect

Question 7:

Score: 0.00

Which layer of the sun's atmosphere contains the cooler low density gas responsible for absorption lines in the sun's spectrum?

✓ a. photosphere

b. chromosphere

✗ c. solar wind

d. corona

e. all of the above

Correct Answer:
a

Status: Incorrect

Question 5:

Score: 0.00

What evidence do we have that the granulation seen on the sun's surface is caused by convection? Hint: See Figure 7-2.

a. The bright centers of granules are cooler than their dark boundaries.

b. The bright centers of granules are hotter than their dark boundaries.

✗ c. Doppler measurements indicate that the centers are rising and edges are sinking.

d. both a and c above

✓ e. both b and c above

Correct Answer:
e

Status: Incorrect

Question 22:

Score: 0.00

Why does nuclear fusion require high temperatures?

a. Protons have positive charge, and like charges repel one another.

✗ b. Two protons must get close enough together to overcome the Coulomb barrier.

c. Two protons must get close enough for the strong force to bind them together.

d. both a and b above

✓ e. all of the above