

- 1 The layer of the atmosphere that tends to retain dust and smoke for long periods of time is the
 - a. ionosphere.
 - b. ozone layer.
 - c. stratosphere.
 - d. mesosphere.
 - e. troposphere.

- 2 An asteroid impact that leaves a huge crater is probably due to an asteroid that is made of
 - a. gold
 - b. frozen gas and ice.
 - c. rocks loosely held together.
 - d. iron and nickel..

- 3 The Oort Cloud is located
 - a. in the same general area as Pluto.
 - b. far beyond the orbit of Pluto.
 - c. between the orbits of Mars and Jupiter.
 - d. between the orbits of Uranus and Neptune.

- 4 If an asteroid that is one kilometer in diameter strikes the Earth, the result is likely to be
 - a. negligible.
 - b. a planet-wide catastrophe.
 - c. similar to a nuclear explosion.

- 5 Pressure waves are transmitted through
 - a. liquids but not solids.
 - b. both solids and liquids.
 - c. solids but not liquids.

- 6 The Oort Cloud is thought to have originated when
 - a. icy objects condensed out in the inner Solar System.
 - b. nearby stars exploded as supernovae.
 - c. icy objects condensed out just beyond Neptune.
 - d. a planet failed to form near Jupiter.
 - e. icy objects condensed out of the interstellar medium.

- 7 Which of the following statements about the moons of terrestrial planets is currently accepted?
 - a. they never have moons.
 - b. they sometimes capture moons by accident.
 - c. moons typically form near them.

- 8 The current effort to defend the Earth against space impacts consists of
 - a. finding most dino-killer type asteroids.
 - b. finding most near-Earth asteroids.
 - c. re-directing Star-Wars anti-missile weapons.
 - d. finding places to hide..
 - e. building a space-patrol fleet of asteroid-killers.

- 9 Planetesimals of rock and iron, prevented from forming a planet by Jupiter's gravity, became
- the asteroid belt.
 - the Moons of the Jovian planets.
 - the interstellar dust.
 - the Oort Cloud.
 - the Kuiper belt.
- 10 Had Jupiter ignited, we would be living in a multiple star system. Such systems
- are extremely rare.
 - are almost universal.
 - have never been seen.
 - are quite common.
- 11 The layer of the Moon's interior that consists of a soft inner part and a solid outer part is
- none of these because it is soft everywhere.
 - the mantle.
 - the crust.
 - none of these because it is solid everywhere.
 - the core.
- 12 Earthquakes are often caused by
- drought.
 - collapsing mountains.
 - torrential rains.
 - high winds.
 - slipping tectonic plates.
- 13 Colder air always
- sinks.
 - moves in circles.
 - goes westward.
 - goes eastward.
 - rises.
- 14 Europe and North America are
- each on a different plate and move toward each other.
 - each on a different plate and move away from each other.
 - on plates that are moving past each other.
 - atop a single plate and move in unison.
- 15 The Moon's orbit
- is perpendicular to the plane of the Earth's equator.
 - is somewhat tilted relative to the plane of the Earth's equator.
 - is in the plane of the Earth's equator.
 - is in the plane of the ecliptic.

- 16 The currently accepted theory of how the Moon formed is the
- divine intervention theory.
 - collision theory.
 - capture theory.
 - co-formation theory.
 - breakup or fission theory.
- 17 As seen from far above the Earth's North Pole,
- no planet orbits the Sun clockwise.
 - only Uranus orbits the Sun clockwise.
 - only Uranus orbits the Sun counterclockwise.
 - no planet orbits the Sun counterclockwise.
- 18 Convection currents in the Earth's Mantle
- are responsible for moving the tectonic plates.
 - cause mass extinctions.
 - happen but do not affect the crust.
 - do not happen because solid rock does not move.
 - are responsible for land tides.
- 19 In the reaction that powers our Sun, the nuclei that collide in the last step to form helium-4 are
- protons.
 - helium-3 nuclei.
 - deuterons.
 - neutrons.
 - helium-2 nuclei.
- 20 The important difference between matter in the radiation zone and matter in the convection zone is that
- the convection zone has atoms with electrons.
 - the convection zone is closer to the center.
 - the convection zone has no atoms with electrons.
 - the convection zone is farther from the center.
 - the convection zone is hotter.
- 21 The layer of the Earth's interior that consists of dense, semiliquid material is the
- outer core.
 - mesosphere.
 - inner core.
 - mantle.
 - crust.
- 22 When the Earth passes through the orbit of a broken-up comet, we see
- increased levels of ozone.
 - a lightning storm.
 - a display of Northern Lights.
 - fire on the Moon.
 - a meteor shower.

- 23 Asteroids are made of
- rock and iron.
 - gold and silver.
 - ice and frozen gas.
 - styrofoam and poster paint.
 - concrete and marble.
- 24 Magnetic fields near the surface of the Sun are measured by using
- magnetometers on space probes.
 - shifts in solar spectra.
 - shifts in the orbit of Mercury.
 - plasma waves following field lines.
 - gamma ray emissions.
- 25 In the original Solar Nebula, Ice and volatile gases were lost
- nowhere in the nebula.
 - close to the center where it was hot.
 - everywhere in the nebula.
 - far from the center where it was cool.
- 26 A solar flare is caused by
- magnetic field lines lifting out of the surface.
 - clouds of sodium vapor.
 - turbulence in the Sun's photosphere.
 - reconnecting magnetic field lines.
 - convection currents below the photosphere.
- 27 The number of maria on the side of the Moon facing away from the Earth is
- greater than on the side facing Earth.
 - less than on the side facing Earth.
 - about the same as on the side facing Earth.
- 28 The number of near-Earth asteroids is large because they
- are in stable orbits and have nowhere else to go.
 - are kicked out of the asteroid belt by Jupiter's gravity.
 - are left over from the formation of our Moon.
 - are the remains of a destroyed planet near the Earth.
- 29 The clearly different size classes of objects in our solar system are: the Sun,
- the planets and their moons.
 - the Jovian planets and the Terrestrial planets.
 - the inner Jovian planets, the outer Jovian planets, and the Terrestrial planets.
 - the planets and the asteroids.
 - the planets, their moons, and the asteroids.

- 30 The Kuiper Belt is the origin of
- the moons of Jupiter.
 - the moons of Mars.
 - long period comets.
 - short period comets.
 - earth-crossing asteroids.
- 31 The Solar Wind originates in the Sun's
- core.
 - transition zone.
 - corona.
 - photosphere.
 - chromosphere.
- 32 High tide should occur
- only when the Moon is overhead.
 - only when the Moon is over the opposite side of the Earth.
 - when the Moon is rising.
 - when the Moon is overhead and when the Moon is over the opposite side of the Earth.
 - when the Moon is setting.
- 33 The twisting of magnetic field lines by the Sun's differential rotation causes
- solar granules.
 - solar eclipses.
 - sunspots.
 - solar gravity.
 - sun dogs.
- 34 Solar prominences are lifted out of the Sun's surface by
- centrifugal force.
 - gravity.
 - convection currents.
 - electric lines of force.
 - magnetic lines of force.
- 35 The high tides drawn up by the Moon's gravity run ahead of the Moon's motion because of
- the effect of the Sun's gravity.
 - dragging by the Earth's magnetic field.
 - the finite speed of gravity.
 - the delayed response of the ocean.
 - friction with the rotating Earth.
- 36 If a sunspot on the Sun's equator goes around the Sun once, a sunspot far from the equator will go around
- less than once.
 - more than once.
 - exactly once.

- 37 The term 'Greenhouse effect' refers to
- the absorption of ultraviolet light by gases in the atmosphere.
 - a theory proposed by Charles T. Greenhouse.
 - the fact that the atmosphere is transparent.
 - the absorption of infrared light by gases in the atmosphere.
 - the destruction of the ozone layer.
- 38 The circular structures on the surface of the Moon are the result of
- moonquakes.
 - volcanos.
 - gas bubbles.
 - fortifications.
 - impacts.
- 39 The layer of dirt underfoot when you stand on the Moon is called the lunar
- regolith.
 - crust.
 - lithosphere.
 - monolith.
 - mantle.
- 40 A proton is the nucleus of an atom of
- Hydrogen.
 - Protonium.
 - Deuterium.
 - Positronium.
 - Helium.
- 41 After a comet's closest approach to the Sun, its tail points
- in all directions at once.
 - nowhere.
 - ahead of its direction of motion.
 - behind its direction of motion.
 - out of the plane of its orbit around the Sun.
- 42 The time from one high tide to the next is lengthened by 24 minutes because of
- friction with the Earth.
 - the effects of land tides.
 - the motion of the Moon in its orbit.
 - the presence of continents blocking the tidal flows.
 - the rotation of the Moon on its axis.

- 43 Nuclei such as protons do not fuse at low temperatures because their speeds are not enough to overcome their
- structural integrity.
 - hard shells.
 - nuclear friction.
 - inertia.
 - electrical repulsion.
- 44 A planet with a large system of moons would have to be a
- Kuiper Belt object.
 - terrestrial planet.
 - Jovian Planet.
- 45 The mass of a carbon atom is 12.00amu while the mass of a helium-4 atom is 4.003amu. If three atoms of helium fuse to form carbon, how much mass is converted into energy?
- 0.002amu
 - 0.004amu
 - 0.006amu
 - 0.009amu
 - 0.012amu
- 46 The epicenters of earthquakes are located
- at random places on the Earth's surface.
 - mostly along the edges of moving plates.
 - mostly along continental boundaries.
 - mostly in the centers of oceans.
 - mostly near the Earth's equator.
- 47 A spring tide can be expected when there is a
- waxing gibbous moon
 - first quarter moon.
 - waxing crescent moon.
 - new moon.
 - waning crescent moon.
- 48 The answer to the 'solar neutrino problem' is now thought to be that
- neutrinos are changing type as they travel.
 - nuclear reaction theory is wrong.
 - the sun's core has shut down.
 - neutrinos are being absorbed by the Sun.
 - neutrinos are vanishing.

Answer Key: Fall2007 AHX2A

- 1 Choice c. (stratosphere.)
- 2 Choice d. (iron and nickel..)
- 3 Choice b. (far beyond the orbit of Pluto.)
- 4 Choice b. (a planet-wide catastrophe.)
- 5 Choice b. (both solids and liquids.)
- 6 Choice a. (icy objects condensed out in the inner Solar System.)
- 7 Choice b. (they sometimes capture moons by accident.)
- 8 Choice a. (finding most dino-killer type asteroids.)
- 9 Choice a. (the asteroid belt.)
- 10 Choice d. (are quite common.)
- 11 Choice b. (the mantle.)
- 12 Choice e. (slipping tectonic plates.)
- 13 Choice a. (sinks.)
- 14 Choice b. (each on a different plate and move away from each other.)
- 15 Choice b. (is somewhat tilted relative to the plane of the Earth's equator.)
- 16 Choice b. (collision theory.)
- 17 Choice a. (no planet orbits the Sun clockwise.)
- 18 Choice a. (are responsible for moving the tectonic plates.)
- 19 Choice b. (helium-3 nuclei.)
- 20 Choice a. (the convection zone has atoms with electrons.)
- 21 Choice d. (mantle.)
- 22 Choice e. (a meteor shower.)
- 23 Choice a. (rock and iron.)
- 24 Choice b. (shifts in solar spectra.)
- 25 Choice b. (close to the center where it was hot.)
- 26 Choice d. (reconnecting magnetic field lines.)
- 27 Choice b. (less than on the side facing Earth.)
- 28 Choice b. (are kicked out of the asteroid belt by Jupiter's gravity.)
- 29 Choice b. (the Jovian planets and the Terrestrial planets.)
- 30 Choice d. (short period comets.)
- 31 Choice c. (corona.)
- 32 Choice d. (when the Moon is overhead and when the Moon is over the opposite side of the Earth.)
- 33 Choice c. (sunspots.)
- 34 Choice e. (magnetic lines of force.)
- 35 Choice e. (friction with the rotating Earth.)
- 36 Choice a. (less than once.)

- 37 Choice d. (the absorption of infrared light by gases in the atmosphere.)
- 38 Choice e. (impacts.)
- 39 Choice a. (regolith.)
- 40 Choice a. (Hydrogen.)
- 41 Choice c. (ahead of its direction of motion.)
- 42 Choice c. (the motion of the Moon in its orbit.)
- 43 Choice e. (electrical repulsion.)
- 44 Choice c. (Jovian Planet.)
- 45 Choice d. (0.009amu)
- 46 Choice b. (mostly along the edges of moving plates.)
- 47 Choice d. (new moon.)
- 48 Choice a. (neutrinos are changing type as they travel.)

Solutions

1. Module 019: The Earth's Atmosphere Question 019.23
2. Module 016: Earth Impacts: Question 016.23
3. Module 015: Comets in Detail: Question 015.31
4. Module 016: Earth Impacts: Question 016.31
5. Module 020: Earth and Moon Interiors Question 020.13
6. Module 017: Formation of the Solar System: Question 017.42
7. Module 014: Solar System Survey: Question 014.23
8. Module 016: Earth Impacts: Question 016.41
9. Module 017: Formation of the Solar System: Question 017.51
10. Module 017: Formation of the Solar System: Question 017.33
11. Module 020: Earth and Moon Interiors Question 020.34
12. Module 021: Continental Drift Question 021.42
13. Module 019: The Earth's Atmosphere Question 019.12
14. Module 021: Continental Drift Question 021.21
15. Module 022: The Earth's Moon Question 022.43
16. Module 022: The Earth's Moon Question 022.51
17. Module 017: Formation of the Solar System: Question 017.12
18. Module 021: Continental Drift Question 021.32
19. Module 042: Nuclear Fire Question 042.43
20. Module 040: Survey of the Sun Question 040.13
21. Module 020: Earth and Moon Interiors Question 020.24
22. Module 015: Comets in Detail: Question 015.44
23. Module 014: Solar System Survey: Question 014.41
24. Module 041: Solar Magnetism and Activity Question 041.12
25. Module 017: Formation of the Solar System: Question 017.22
26. Module 041: Solar Magnetism and Activity Question 041.41
27. Module 022: The Earth's Moon Question 022.14
28. Module 016: Earth Impacts: Question 016.11
29. Module 014: Solar System Survey: Question 014.11
30. Module 015: Comets in Detail: Question 015.23
31. Module 040: Survey of the Sun Question 040.25
32. Module 018: The Moon and the Tides: Question 018.11
33. Module 041: Solar Magnetism and Activity Question 041.22
34. Module 041: Solar Magnetism and Activity Question 041.31
35. Module 018: The Moon and the Tides: Question 018.42
36. Module 040: Survey of the Sun Question 040.32

37. Module 019: The Earth's Atmosphere Question 019.31
38. Module 022: The Earth's Moon Question 022.21
39. Module 022: The Earth's Moon Question 022.31
40. Module 042: Nuclear Fire Question 042.12
41. Module 015: Comets in Detail: Question 015.12
42. Module 018: The Moon and the Tides: Question 018.32
43. Module 042: Nuclear Fire Question 042.33
44. Module 014: Solar System Survey: Question 014.34
45. Module 042: Nuclear Fire Question 042.21
46. Module 021: Continental Drift Question 021.12
47. Module 018: The Moon and the Tides: Question 018.21
48. Module 042: Nuclear Fire Question 042.53