

- 1 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. icy objects condensed out of the interstellar medium.
  - e. a planet failed to form near Jupiter.
  
- 2 In the original Solar Nebula, Ice and volatile gases were lost
  - a. close to the center where it was hot.
  - b. nowhere in the nebula.
  - c. far from the center where it was cool.
  - d. everywhere in the nebula.
  
- 3 When the Earth passes through the orbit of a broken-up comet, we see
  - a. a display of Northern Lights.
  - b. a meteor shower.
  - c. fire on the Moon.
  - d. a lightning storm.
  - e. increased levels of ozone.
  
- 4 The layer of the Earth's interior that consists of dense, semiliquid material is the
  - a. inner core.
  - b. outer core.
  - c. crust.
  - d. mantle.
  - e. mesosphere.
  
- 5 Planetesimals of rock and iron, prevented from forming a planet by Jupiter's gravity, became
  - a. the Oort Cloud.
  - b. the asteroid belt.
  - c. the interstellar dust.
  - d. the Kuiper belt.
  - e. the Moons of the Jovian planets.
  
- 6 The layer of the atmosphere that tends to retain dust and smoke for long periods of time is the
  - a. ionosphere.
  - b. troposphere.
  - c. ozone layer.
  - d. mesosphere.
  - e. stratosphere.
  
- 7 The circular structures on the surface of the Moon are the result of
  - a. gas bubbles.
  - b. fortifications.
  - c. volcanos.
  - d. impacts.
  - e. moonquakes.

- 8 The twisting of magnetic field lines by the Sun's differential rotation causes
- solar eclipses.
  - solar granules.
  - sunspots.
  - sun dogs.
  - solar gravity.
- 9 Solar prominences are lifted out of the Sun's surface by
- magnetic lines of force.
  - gravity.
  - electric lines of force.
  - convection currents.
  - centrifugal force.
- 10 The epicenters of earthquakes are located
- mostly near the Earth's equator.
  - 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.
- 11 The Oort Cloud is located
- in the same general area as Pluto.
  - between the orbits of Mars and Jupiter.
  - between the orbits of Uranus and Neptune.
  - far beyond the orbit of Pluto.
- 12 The number of maria on the side of the Moon facing away from the Earth is
- less than on the side facing Earth.
  - greater than on the side facing Earth.
  - about the same as on the side facing Earth.
- 13 Colder air always
- goes eastward.
  - moves in circles.
  - goes westward.
  - sinks.
  - rises.
- 14 Which of the following statements about the moons of terrestrial planets is currently accepted?
- they sometimes capture moons by accident.
  - they never have moons.
  - moons typically form near them.

- 15 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?
- 0.004amu
  - 0.006amu
  - 0.012amu
  - 0.009amu
  - 0.002amu
- 16 The time from one high tide to the next is lengthened by 24 minutes because of
- the effects of land tides.
  - friction with the Earth.
  - the rotation of the Moon on its axis.
  - the presence of continents blocking the tidal flows.
  - the motion of the Moon in its orbit.
- 17 If an asteroid that is one kilometer in diameter strikes the Earth, the result is likely to be
- similar to a nuclear explosion.
  - negligible.
  - a planet-wide catastrophe.
- 18 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.
- 19 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 core.
  - none of these because it is solid everywhere.
  - the crust.
- 20 High tide should occur
- only when the Moon is overhead.
  - when the Moon is setting.
  - when the Moon is rising.
  - only when the Moon is over the opposite side of the Earth.
  - when the Moon is overhead and when the Moon is over the opposite side of the Earth.
- 21 A proton is the nucleus of an atom of
- Helium.
  - Hydrogen.
  - Protonium.
  - Positronium.
  - Deuterium.

- 22 An asteroid impact that leaves a huge crater is probably due to an asteroid that is made of
- gold
  - rocks loosely held together.
  - iron and nickel..
  - frozen gas and ice.
- 23 The term 'Greenhouse effect' refers to
- the absorbtion of infrared light by gases in the atmosphere.
  - the fact that the atmosphere is transparent.
  - a theory proposed by Charles T. Greenhouse.
  - the destruction of the ozone layer.
  - the absorbtion of ultraviolet light by gases in the atmosphere.
- 24 Convection currents in the Earth's Mantle
- are responsible for moving the tectonic plates.
  - are responsible for land tides.
  - do not happen because solid rock does not move.
  - cause mass extinctions.
  - happen but do not affect the crust.
- 25 The Kuiper Belt is the origin of
- short period comets.
  - the moons of Jupiter.
  - the moons of Mars.
  - earth-crossing asteroids.
  - long period comets.
- 26 The currently accepted theory of how the Moon formed is the
- collision theory.
  - divine intervention theory.
  - capture theory.
  - co-formation theory.
  - breakup or fission theory.
- 27 A solar flare is caused by
- clouds of sodium vapor.
  - convection currents below the photosphere.
  - magnetic field lines lifting out of the surface.
  - reconnecting magnetic field lines.
  - turbulence in the Sun's photosphere.
- 28 As seen from far above the Earth's North Pole,
- no planet orbits the Sun counterclockwise.
  - only Uranus orbits the Sun clockwise.
  - no planet orbits the Sun clockwise.
  - only Uranus orbits the Sun counterclockwise.

- 29 The high tides drawn up by the Moon's gravity run ahead of the Moon's motion because of
- the delayed response of the ocean.
  - the finite speed of gravity.
  - friction with the rotating Earth.
  - the effect of the Sun's gravity.
  - dragging by the Earth's magnetic field.
- 30 The important difference between matter in the radiation zone and matter in the convection zone is that
- the convection zone has no atoms with electrons.
  - the convection zone has atoms with electrons.
  - the convection zone is closer to the center.
  - the convection zone is hotter.
  - the convection zone is farther from the center.
- 31 A spring tide can be expected when there is a
- first quarter moon.
  - waxing gibbous moon
  - new moon.
  - waxing crescent moon.
  - waning crescent moon.
- 32 In the reaction that powers our Sun, the nuclei that collide in the last step to form helium-4 are
- neutrons.
  - helium-2 nuclei.
  - protons.
  - helium-3 nuclei.
  - deuterons.
- 33 Europe and North America are
- on plates that are moving past each other.
  - each on a different plate and move away from each other.
  - atop a single plate and move in unison.
  - each on a different plate and move toward each other.
- 34 Earthquakes are often caused by
- slipping tectonic plates.
  - collapsing mountains.
  - drought.
  - high winds.
  - torrential rains.
- 35 Nuclei such as protons do not fuse at low temperatures because their speeds are not enough to overcome their
- structural integrity.
  - electrical repulsion.
  - nuclear friction.
  - inertia.
  - hard shells.

- 36 The number of near-Earth asteroids is large because they
- are in stable orbits and have nowhere else to go.
  - are left over from the formation of our Moon.
  - are the remains of a destroyed planet near the Earth.
  - are kicked out of the asteroid belt by Jupiter's gravity.
- 37 The current effort to defend the Earth against space impacts consists of
- building a space-patrol fleet of asteroid-killers.
  - finding places to hide..
  - re-directing Star-Wars anti-missile weapons.
  - finding most dino-killer type asteroids.
  - finding most near-Earth asteroids.
- 38 Asteroids are made of
- gold and silver.
  - ice and frozen gas.
  - styrofoam and poster paint.
  - concrete and marble.
  - rock and iron.
- 39 The layer of dirt underfoot when you stand on the Moon is called the lunar
- regolith.
  - lithosphere.
  - mantle.
  - crust.
  - monolith.
- 40 The clearly different size classes of objects in our solar system are: the Sun,
- the Jovian planets and the Terrestrial planets.
  - the planets and their moons.
  - the planets, their moons, and the asteroids.
  - the planets and the asteroids.
  - the inner Jovian planets, the outer Jovian planets, and the Terrestrial planets.
- 41 The Solar Wind originates in the Sun's
- chromosphere.
  - transition zone.
  - corona.
  - photosphere.
  - core.
- 42 The answer to the 'solar neutrino problem' is now thought to be that
- neutrinos are changing type as they travel.
  - neutrinos are vanishing.
  - neutrinos are being absorbed by the Sun.
  - nuclear reaction theory is wrong.
  - the sun's core has shut down.

- 43 The Moon's orbit
- is in the plane of the Earth's equator.
  - is in the plane of the ecliptic.
  - is perpendicular to the plane of the Earth's equator.
  - is somewhat tilted relative to the plane of the Earth's equator.
- 44 Pressure waves are transmitted through
- liquids but not solids.
  - both solids and liquids.
  - solids but not liquids.
- 45 Magnetic fields near the surface of the Sun are measured by using
- shifts in solar spectra.
  - magnetometers on space probes.
  - gamma ray emissions.
  - plasma waves following field lines.
  - shifts in the orbit of Mercury.
- 46 A planet with a large system of moons would have to be a
- terrestrial planet.
  - Jovian Planet.
  - Kuiper Belt object.
- 47 If a sunspot on the Sun's equator goes around the Sun once, a sunspot far from the equator will go around
- more than once.
  - less than once.
  - exactly once.
- 48 After a comet's closest approach to the Sun, its tail points
- ahead of its direction of motion.
  - in all directions at once.
  - out of the plane of its orbit around the Sun.
  - nowhere.
  - behind its direction of motion.

## Answer Key: Fall2007 AHX2C

- 1 Choice a. (icy objects condensed out in the inner Solar System.)
- 2 Choice a. (close to the center where it was hot.)
- 3 Choice b. (a meteor shower.)
- 4 Choice d. (mantle.)
- 5 Choice b. (the asteroid belt.)
- 6 Choice e. (stratosphere.)
- 7 Choice d. (impacts.)
- 8 Choice c. (sunspots.)
- 9 Choice a. (magnetic lines of force.)
- 10 Choice c. (mostly along the edges of moving plates.)
- 11 Choice d. (far beyond the orbit of Pluto.)
- 12 Choice a. (less than on the side facing Earth.)
- 13 Choice d. (sinks.)
- 14 Choice a. (they sometimes capture moons by accident.)
- 15 Choice d. (0.009amu)
- 16 Choice e. (the motion of the Moon in its orbit.)
- 17 Choice c. (a planet-wide catastrophe.)
- 18 Choice d. (are quite common.)
- 19 Choice b. (the mantle.)
- 20 Choice e. (when the Moon is overhead and when the Moon is over the opposite side of the Earth.)
- 21 Choice b. (Hydrogen.)
- 22 Choice c. (iron and nickel.)
- 23 Choice a. (the absorption of infrared light by gases in the atmosphere.)
- 24 Choice a. (are responsible for moving the tectonic plates.)
- 25 Choice a. (short period comets.)
- 26 Choice a. (collision theory.)
- 27 Choice d. (reconnecting magnetic field lines.)
- 28 Choice c. (no planet orbits the Sun clockwise.)
- 29 Choice c. (friction with the rotating Earth.)
- 30 Choice b. (the convection zone has atoms with electrons.)
- 31 Choice c. (new moon.)
- 32 Choice d. (helium-3 nuclei.)
- 33 Choice b. (each on a different plate and move away from each other.)
- 34 Choice a. (slipping tectonic plates.)
- 35 Choice b. (electrical repulsion.)
- 36 Choice d. (are kicked out of the asteroid belt by Jupiter's gravity.)



- 37 Choice d. (finding most dino-killer type asteroids.)
- 38 Choice e. (rock and iron.)
- 39 Choice a. (regolith.)
- 40 Choice a. (the Jovian planets and the Terrestrial planets.)
- 41 Choice c. (corona.)
- 42 Choice a. (neutrinos are changing type as they travel.)
- 43 Choice d. (is somewhat tilted relative to the plane of the Earth's equator.)
- 44 Choice b. (both solids and liquids.)
- 45 Choice a. (shifts in solar spectra.)
- 46 Choice b. (Jovian Planet.)
- 47 Choice b. (less than once.)
- 48 Choice a. (ahead of its direction of motion.)

## Solutions

- 1 Module 017: Formation of the Solar System: Question 017.42
- 2 Module 017: Formation of the Solar System: Question 017.22
- 3 Module 015: Comets in Detail: Question 015.44
- 4 Module 020: Earth and Moon Interiors Question 020.24
- 5 Module 017: Formation of the Solar System: Question 017.51
- 6 Module 019: The Earth's Atmosphere Question 019.23
- 7 Module 022: The Earth's Moon Question 022.21
- 8 Module 041: Solar Magnetism and Activity Question 041.22
- 9 Module 041: Solar Magnetism and Activity Question 041.31
- 10 Module 021: Continental Drift Question 021.12
- 11 Module 015: Comets in Detail: Question 015.31
- 12 Module 022: The Earth's Moon Question 022.14
- 13 Module 019: The Earth's Atmosphere Question 019.12
- 14 Module 014: Solar System Survey: Question 014.23
- 15 Module 042: Nuclear Fire Question 042.21
- 16 Module 018: The Moon and the Tides: Question 018.32
- 17 Module 016: Earth Impacts: Question 016.31
- 18 Module 017: Formation of the Solar System: Question 017.33
- 19 Module 020: Earth and Moon Interiors Question 020.34
- 20 Module 018: The Moon and the Tides: Question 018.11
- 21 Module 042: Nuclear Fire Question 042.12
- 22 Module 016: Earth Impacts: Question 016.23
- 23 Module 019: The Earth's Atmosphere Question 019.31
- 24 Module 021: Continental Drift Question 021.32
- 25 Module 015: Comets in Detail: Question 015.23
- 26 Module 022: The Earth's Moon Question 022.51
- 27 Module 041: Solar Magnetism and Activity Question 041.41
- 28 Module 017: Formation of the Solar System: Question 017.12
- 29 Module 018: The Moon and the Tides: Question 018.42
- 30 Module 040: Survey of the Sun Question 040.13
- 31 Module 018: The Moon and the Tides: Question 018.21
- 32 Module 042: Nuclear Fire Question 042.43
- 33 Module 021: Continental Drift Question 021.21
- 34 Module 021: Continental Drift Question 021.42
- 35 Module 042: Nuclear Fire Question 042.33
- 36 Module 016: Earth Impacts: Question 016.11

- 37 Module 016: Earth Impacts: Question 016.41
- 38 Module 014: Solar System Survey: Question 014.41
- 39 Module 022: The Earth's Moon Question 022.31
- 40 Module 014: Solar System Survey: Question 014.11
- 41 Module 040: Survey of the Sun Question 040.25
- 42 Module 042: Nuclear Fire Question 042.53
- 43 Module 022: The Earth's Moon Question 022.43
- 44 Module 020: Earth and Moon Interiors Question 020.13
- 45 Module 041: Solar Magnetism and Activity Question 041.12
- 46 Module 014: Solar System Survey: Question 014.34
- 47 Module 040: Survey of the Sun Question 040.32
- 48 Module 015: Comets in Detail: Question 015.12