1 Magnetic fields near the surface of the Sun are measured by using
   a. gamma ray emissions.
   b. shifts in the orbit of Mercury.
   c. plasma waves following field lines.
   d. magnetometers on space probes.
   e. shifts in solar spectra.

2 A solar flare is caused by
   a. convection currents below the photosphere.
   b. turbulence in the Sun's photosphere.
   c. reconnecting magnetic field lines.
   d. clouds of sodium vapor.
   e. magnetic field lines lifting out of the surface.

3 High tide should occur
   a. when the Moon is overhead and when the Moon is over the opposite side of the Earth.
   b. only when the Moon is overhead.
   c. only when the Moon is over the opposite side of the Earth.
   d. when the Moon is rising.
   e. when the Moon is setting.

4 When the Earth passes through the orbit of a broken-up comet, we see
   a. a meteor shower.
   b. a lightning storm.
   c. a display of Northern Lights.
   d. fire on the Moon.
   e. increased levels of ozone.

5 Colder air always
   a. rises.
   b. goes westward.
   c. moves in circles.
   d. goes eastward.
   e. sinks.

6 After a comet's closest approach to the Sun, its tail points
   a. out of the plane of its orbit around the Sun.
   b. in all directions at once.
   c. ahead of its direction of motion.
   d. behind its direction of motion.
   e. nowhere.

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

8 In the original Solar Nebula, Ice and volatile gases were lost
   a. close to the center where it was hot.
   b. far from the center where it was cool.
   c. nowhere in the nebula.
   d. everywhere in the nebula.

9 The number of maria on the side of the Moon facing away from the Earth is
   a. less than on the side facing Earth.
   b. greater than on the side facing Earth.
   c. about the same as on the side facing Earth.

10 Planetesimals of rock and iron, prevented from forming a planet by Jupiter's gravity, became
   a. the Oort Cloud.
   b. the Kuiper belt.
   c. the interstellar dust.
   d. the asteroid belt.
   e. the Moons of the Jovian planets.

11 A spring tide can be expected when there is a
   a. waxing gibbous moon
   b. waning crescent moon.
   c. waxing crescent moon.
   d. new moon.
   e. first quarter moon.

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

13 The layer of the Moon's interior that consists of a soft inner part and a solid outer part is
   a. the mantle.
   b. none of these because it is solid everywhere.
   c. none of these because it is soft everywhere.
   d. the core.
   e. the crust.

14 The layer of the Earth's interior that consists of dense, semiliquid material is the
   a. mesosphere.
   b. crust.
   c. inner core.
   d. outer core.
   e. mantle.

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

16 The clearly different size classes of objects in our solar system are: the Sun,
   a. the planets and their moons.
   b. the planets and the asteroids.
   c. the planets, their moons, and the asteroids.
   d. the inner Jovian planets, the outer Jovian planets, and the Terrestrial planets.
   e. the Jovian planets and the Terrestrial planets.

17 As seen from far above the Earth's North Pole,
   a. no planet orbits the Sun counterclockwise.
   b. only Uranus orbits the Sun counterclockwise.
   c. only Uranus orbits the Sun clockwise.
   d. no planet orbits the Sun clockwise.

18 The term 'Greenhouse effect' refers to
   a. the absorbtion of ultraviolet light by gases in the atmosphere.
   b. the fact that the atmosphere is transparent.
   c. a theory proposed by Charles T. Greenhouse.
   d. the absorbtion of infrared light by gases in the atmosphere.
   e. the destruction of the ozone layer.

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

20 Asteroids are made of
   a. ice and frozen gas.
   b. concrete and marble.
   c. styrofoam and poster paint.
   d. rock and iron.
   e. gold and silver.

21 The high tides drawn up by the Moon's gravity run ahead of the Moon's motion because of
   a. friction with the rotating Earth.
   b. the effect of the Sun's gravity.
   c. the finite speed of gravity.
   d. the delayed response of the ocean.
   e. dragging by the Earth's magnetic field.

22 Had Jupiter ignited, we would be living in a multiple star system. Such systems
a. are extremely rare.
b. are almost universal.
c. have never been seen.
d. are quite common.

23 The important difference between matter in the radiation zone and matter in the convection zone is that
a. the convection zone is farther from the center.
b. the convection zone has no atoms with electrons.
c. the convection zone is hotter.
d. the convection zone is closer to the center.
e. the convection zone has atoms with electrons.

24 The epicenters of earthquakes are located
a. mostly along the edges of moving plates.
b. mostly along continental boundaries.
c. at random places on the Earth's surface.
d. mostly in the centers of oceans.
e. mostly near the Earth's equator.

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

26 The Solar Wind originates in the Sun's
a. photosphere.
b. corona.
c. transition zone.
d. chromosphere.
e. core.

27 Convection currents in the Earth's Mantle
a. happen but do not affect the crust.
b. do not happen because solid rock does not move.
c. are responsible for land tides.
d. cause mass extinctions.
e. are responsible for moving the tectonic plates.

28 In the reaction that powers our Sun, the nuclei that collide in the last step to form helium-4 are
a. helium-2 nuclei.
b. deuterons.
c. helium-3 nuclei.
d. neutrons.
e. protons.

29 The Moon's orbit
   a. is perpendicular to the plane of the Earth's equator.
   b. is in the plane of the Earth's equator.
   c. is in the plane of the ecliptic.
   d. is somewhat tilted relative to the plane of the Earth's equator.

30 The twisting of magnetic field lines by the Sun's differential rotation causes
   a. solar gravity.
   b. sunspots.
   c. solar granules.
   d. solar eclipses.
   e. sun dogs.

31 The layer of dirt underfoot when you stand on the Moon is called the lunar
   a. mantle.
   b. monolith.
   c. lithosphere.
   d. crust.
   e. regolith.

32 Nuclei such as protons do not fuse at low temperatures because their speeds are not enough to overcome their
   a. inertia.
   b. structural integrity.
   c. electrical repulsion.
   d. hard shells.
   e. nuclear friction.

33 Earthquakes are often caused by
   a. slipping tectonic plates.
   b. torrential rains.
   c. high winds.
   d. drought.
   e. collapsing mountains.

34 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?
   a. 0.004amu
   b. 0.012amu
   c. 0.006amu
   d. 0.002amu
   e. 0.009amu

35 Europe and North America are
   a. on plates that are moving past each other.
   b. each on a different plate and move toward each other.
   c. each on a different plate and move away from each other.
   d. atop a single plate and move in unison.

36 A planet with a large system of moons would have to be a
   a. Jovian Planet.
   b. Kuiper Belt object.
   c. terrestrial planet.

37 Solar prominences are lifted out of the Sun's surface by
   a. convection currents.
   b. electric lines of force.
   c. magnetic lines of force.
   d. centrifugal force.
   e. gravity.

38 The Kuiper Belt is the origin of
   a. earth-crossing asteroids.
   b. short period comets.
   c. the moons of Jupiter.
   d. the moons of Mars.
   e. long period comets.

39 The time from one high tide to the next is lengthened by 24 minutes because of
   a. the motion of the Moon in its orbit.
   b. friction with the Earth.
   c. the effects of land tides.
   d. the presence of continents blocking the tidal flows.
   e. the rotation of the Moon on its axis.

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

41 The currently accepted theory of how the Moon formed is the
   a. capture theory.
   b. breakup or fission theory.
   c. collision theory.
   d. co-formation theory.
   e. divine intervention theory.

42 The number of near-Earth asteroids is large because they
   a. are left over from the formation of our Moon.
   b. are kicked out of the asteroid belt by Jupiter's gravity.
   c. are the remains of a destroyed planet near the Earth.
   d. are in stable orbits and have nowhere else to go.

43 The circular structures on the surface of the Moon are the result of

a. impacts.
b. gas bubbles.
c. moonquakes.
d. volcanos.
e. fortifications.

44 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.

45 The current effort to defend the Earth against space impacts consists of

a. finding most dino-killer type asteroids.
b. finding places to hide..
c. building a space-patrol fleet of asteroid-killers.
d. finding most near-Earth asteroids.
e. re-directing Star-Wars anti-missile weapons.

46 If a sunspot on the Sun's equator goes around the Sun once, a sunspot far from the equator will go around

a. exactly once.
b. more than once.
c. less than once.

47 The answer to the 'solar neutrino problem' is now thought to be that

a. neutrinos are being absorbed by the Sun.
b. neutrinos are vanishing.
c. the sun's core has shut down.
d. neutrinos are changing type as they travel.
e. nuclear reaction theory is wrong.

48 A proton is the nucleus of an atom of

a. Protonium.
b. Positronium.
c. Deuterium.
d. Helium.
e. Hydrogen.

Answer Key: Fall2007 AHX2B

1 Choice e. (shifts in solar spectra.)
2 Choice c. (reconnecting magnetic field lines.)
3 Choice a. (when the Moon is overhead and when the Moon is over the opposite side of the Earth.)
4 Choice a. (a meteor shower.)
5 Choice e. (sinks.)
6 Choice c. (ahead of its direction of motion.)
7 Choice a. (both solids and liquids.)
8 Choice a. (close to the center where it was hot.)
9 Choice a. (less than on the side facing Earth.)
10 Choice d. (the asteroid belt.)
11 Choice d. (new moon.)
12 Choice b. (far beyond the orbit of Pluto.)
13 Choice a. (the mantle.)
14 Choice e. (mantle.)
15 Choice a. (stratosphere.)
16 Choice e. (the Jovian planets and the Terrestrial planets.)
17 Choice d. (no planet orbits the Sun clockwise.)
18 Choice d. (the absorbtion of infrared light by gases in the atmosphere.)
19 Choice d. (icy objects condensed out in the inner Solar System.)
20 Choice d. (rock and iron.)
21 Choice a. (friction with the rotating Earth.)
22 Choice d. (are quite common.)
23 Choice e. (the convection zone has atoms with electrons.)
24 Choice a. (mostly along the edges of moving plates.)
25 Choice c. (they sometimes capture moons by accident.)
26 Choice b. (corona.)
27 Choice e. (are responsible for moving the tectonic plates.)
28 Choice c. (helium-3 nuclei.)
29 Choice d. (is somewhat tilted relative to the plane of the Earth’s equator.)
30 Choice b. (sunspots.)
31 Choice e. (regolith.)
32 Choice c. (electrical repulsion.)
33 Choice a. (slipping tectonic plates.)
34 Choice e. (0.009amu)
35 Choice c. (each on a different plate and move away from each other.)
36 Choice a. (Jovian Planet.)

37 Choice c. (magnetic lines of force.)

38 Choice b. (short period comets.)

39 Choice a. (the motion of the Moon in its orbit.)

40 Choice b. (iron and nickel..)

41 Choice c. (collision theory.)

42 Choice b. (are kicked out of the asteroid belt by Jupiter's gravity.)

43 Choice a. (impacts.)

44 Choice b. (a planet-wide catastrophe.)

45 Choice a. (finding most dino-killer type asteroids.)

46 Choice c. (less than once.)

47 Choice d. (neutrinos are changing type as they travel.)

48 Choice e. (Hydrogen.)

Solutions

1 Module 041: Solar Magnetism and Activity Question 041.12

2 Module 041: Solar Magnetism and Activity Question 041.41

3 Module 018: The Moon and the Tides: Question 018.11

4 Module 015: Comets in Detail: Question 015.44

5 Module 019: The Earth's Atmosphere Question 019.12

6 Module 015: Comets in Detail: Question 015.12

7 Module 020:Earth and Moon Interiors Question 020.13

8 Module 017: Formation of the Solar System: Question 017.22

9 Module 022: The Earth's Moon Question 022.14

10 Module 017: Formation of the Solar System: Question 017.51

11 Module 018: The Moon and the Tides: Question 018.21

12 Module 015: Comets in Detail: Question 015.31

13 Module 020: Earth and Moon Interiors Question 020.34

14 Module 020: Earth and Moon Interiors Question 020.24

15 Module 019: The Earth's Atmosphere Question 019.23

16 Module 014: Solar System Survey: Question 014.11

17 Module 017: Formation of the Solar System: Question 017.12

18 Module 019: The Earth's Atmosphere Question 019.31

19 Module 017: Formation of the Solar System: Question 017.42

20 Module 014: Solar System Survey: Question 014.41

21 Module 018: The Moon and the Tides: Question 018.42

22 Module 017: Formation of the Solar System: Question 017.33

23 Module 040: Survey of the Sun Question 040.13

24 Module 021: Continental Drift Question 021.12

25 Module 014: Solar System Survey: Question 014.23

26 Module 040: Survey of the Sun Question 040.25

27 Module 021: Continental Drift Question 021.32

28 Module 042: Nuclear Fire Question 042.43

29 Module 022: The Earth's Moon Question 022.43

30 Module 041: Solar Magnetism and Activity Question 041.22

31 Module 022: The Earth's Moon Question 022.31

32 Module 042: Nuclear Fire Question 042.33

33 Module 021: Continental Drift Question 021.42

34 Module 042: Nuclear Fire Question 042.21

35 Module 021: Continental Drift Question 021.21

36 Module 014: Solar System Survey: Question 014.34

37 Module 041: Solar Magnetism and Activity Question 041.31

38 Module 015: Comets in Detail: Question 015.23

39 Module 018: The Moon and the Tides: Question 018.32

40 Module 016: Earth Impacts: Question 016.23

41 Module 022: The Earth's Moon Question 022.51

42 Module 016: Earth Impacts: Question 016.11

43 Module 022: The Earth's Moon Question 022.21

44 Module 016: Earth Impacts: Question 016.31

45 Module 016: Earth Impacts: Question 016.41

46 Module 040: Survey of the Sun Question 040.32

47 Module 042: Nuclear Fire Question 042.53

48 Module 042: Nuclear Fire Question 042.12