1 The Earth orbits nearly in the plane of the Sun's equator as do
   a. all of the other traditional (pre-2006) planets except for Pluto.
   b. all of the other traditional (pre-2006) planets except for Mars.
   c. all of the other traditional (pre-2006) planets except for Venus.
   d. all of the other traditional (pre-2006) planets except for Uranus.

2 Of the two tidal bulges in the ocean that are caused by the Moon's gravity, one is actually
   a. behind the Moon's motion.
   b. ahead of the Moon's motion.
   c. directly under the Moon.

3 Icy objects were ejected from the inner solar system to form
   a. the Oort Cloud.
   b. the interstellar dust.
   c. the Kuiper belt.
   d. the asteroid belt.
   e. the Moons of the Jovian planets.

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

5 The Oort Cloud is
   a. distributed in all directions.
   b. a belt of objects mostly in the plane of the solar system.
   c. distributed along the rotation axis of the solar system.

6 The edges of the moving plates on the Earth's surface are often where
   a. hurricanes occur.
   b. glaciers occur.
   c. large lakes occur.
   d. earthquakes occur.
   e. floods occur.

7 When the number of sunspots is greatest, the energy output of the Sun is
   a. decreased because the spots radiate less.
   b. increased because solar activity is greater.
   c. unaffected because the spots are small.

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

9 The density of rock is about 3000kg/m^3. The densities of the jovian planets are
   a. close to 3000kg/m^3 because they are mostly rock.
   b. less than 3000kg/m^3 because they are mostly gas.
   c. greater than 3000kg/m^3 because they have iron cores.

10 In the original Solar Nebula, rock, iron, and other metals were lost
   a. everywhere in the nebula.
   b. nowhere in the nebula.
   c. close to the center where it was hot.
   d. far from the center where it was cool.

11 Detecting too few neutrinos from the Sun was a problem because it meant that
   a. some part of the theory was wrong.
   b. government grant money would be lost.
   c. the detectors were not working.

12 The absorbtion and re-radiation of infrared light by gases such as carbon dioxide is the key process in the
   a. creation of smog.
   b. the destruction of the ozone layer.
   c. Greenhouse Effect.
   d. creation of the ionosphere.
   e. Stark Effect.

13 An asteroid whose impact generates a planet-wide catastrophe, changing the climate everywhere, probably has a diameter of about
   a. 50 meters.
   b. 100,000 meters or larger.
   c. 1000 to 10,000 meters.
   d. 1 to 5 meters.

14 The Sun's corona is the place where
   a. the Solar Wind comes from.
   b. convection cells come from.
   c. sunspots start.
   d. spicules come from.
   e. visible light comes from.

15 Sunspots are caused by
   a. turbulence in the Sun's photosphere.
   b. convection currents below the photosphere.
   c. clouds of sodium vapor.
   d. islands of excess iron content.
   e. differential rotation and magnetic fields.

16 When the magnetic field lifts away from the Sun's surface and carries some gas with it, the result is called a
a. coronal hole.
b. convection cell.
c. solar prominence.
d. solar flare.
e. solar granule.

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

18 The highest altitude layer of the atmosphere is the
a. troposphere.
b. mesosphere.
c. stratosphere.
d. ionosphere.
e. ozone layer.

19 Ancient lava flows on the Moon are called Lunar
a. maria.
b. terrae.
c. valleys.
d. planitia.
e. craters.

20 In a region of the atmosphere in which the temperature rises with increasing altitude
a. you expect no changes.
b. you expect rapid changes.

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

22 The paths of comets usually
a. extend far beyond the orbit of Pluto.
b. stay between the orbits of Uranus and Neptune.
c. stay within the orbit of Pluto.
d. stay between the orbits of Mars and Jupiter.
e. stay closer to the Sun than Mars does.

23 The Moon's orbit

a. is somewhat tilted relative 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 perpendicular to the plane of the Earth's equator.

24 The mass of a carbon atom is 12.00amu while the mass of a deuterium atom is 2.014amu. If six deuterium atoms fuse to form a carbon atom, how much mass is converted into energy?

a. 0.014amu
b. 0.009amu
c. 0.084amu
d. 0.168amu
e. 0.056amu

25 Compared to its value elsewhere on the Sun, the magnetic field intensity over a sunspot is found to be about

a. 1/10 the value.
b. 1/1000 the value.
c. 1000 times the value.
d. ten times the value.
e. the same.

26 Because of the electrical repulsion between atomic nuclei, nuclear fusion happens only

a. at low pressures.
b. at high temperatures.
c. in dark places.
d. in solids.
e. at low temperatures.

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

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

28 High tide should occur

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

29 When there is a third quarter Moon, you can expect that tides will be

a. unusually weak.
b. totally absent.
c. unusually strong.
d. of usual strength.

30 The Tau-Tauri wind from the Sun's ignition
   a. provided the heat that Jupiter needed to become a star.
   b. provided gas to Jupiter and the other Jovian planets.
   c. blew away the fuel that Jupiter needed to become a star.
   d. had no effect on the Jovian planets.
   e. moved Jupiter to its present orbit.

31 Compared to the Earth's crust, the Moon's crust is
   a. four times as thick everywhere.
   b. the same thickness.
   c. eight times as thick on the near side and four times as thick on the far side.
   d. four times as thick on the near side and eight times as thick on the far side.
   e. eight times as thick everywhere.

32 In our Sun, the radiation zone is located
   a. at the very center.
   b. above the central region but well below the surface.
   c. near the surface.

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

34 In the reaction that powers our Sun, protons collide to make
   a. helium-3 in one step.
   b. helium-4 in one step.
   c. deuterons in one step.
   d. tritium in one step.
   e. carbon in one step.

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

36 The Lunar Regolith is
   a. another name for the lunar crust.
   b. the soft part of the lunar core.
   c. the layer just above the core.
   d. a rock layer just beneath the lunar surface.
   e. a layer of dirt on the lunar surface.

37 which of the following particles would be repelled by a proton?

a. positron.
b. electron.
c. neutrino.
d. neutron.

38 Underneath a place where the sea floor is spreading, one expects there to be

a. a rising convection current in the Earth's mantle.
b. a bubble in the Earth's mantle.
c. a horizontal current in the Earth's mantle.
d. a descending convection current in the Earth's mantle.
e. a magnetic domain in the Earth's core.

39 You may hear about an Earth Impact Warning at a certain level on the Torino Scale. That scale ranges from zero to

a. 1.
b. 5.
c. 100.
d. 10.
e. 1000.

40 An asteroid whose impact generates an explosion similar to that of a typical nuclear weapon probably has a diameter of about

a. 50 meters.
b. 1 to 5 meters.
c. 100,000 meters or larger.
d. 1000 to 10,000 meters.

41 The first generally accepted example of Sea-floor spreading was under the

a. Pacific Ocean.
b. Gulf of Mexico.
c. Indian Ocean.
d. Atlantic Ocean.
e. English Channel.

42 The density of rock is about 3000kg/m^3. The density of the Earth is

a. close to 3000kg/m^3 because most of the Earth is rock.
b. less than 3000kg/m^3 because so much of the Earth is water.
c. greater than 3000kg/m^3 because the Earth has an iron core.

43 Seismic waves are used to determine the Earth's

a. interior structure.
b. rotation rate.
c. mass.
d. size.

44 When tectonic plates move past each other, they usually cause
a. forest fires.
b. hurricanes.
c. floods.
d. earthquakes.
e. tornados.

45 An annual meteor shower occurs when
a. asteroids hit the Earth.
b. our Sun passes through a spiral arm.
c. a nearby star explodes.
d. the Solar Wind hits the Earth's atmosphere.
e. the Earth passes through comet debris.

46 Because of the Earth's rotation and the Moon's orbit, the time from one high tide to the next should be closest to
a. twelve hours.
b. six and a quarter hours.
c. twelve and a half hours.
d. twenty-five hours.
e. six hours.

47 The tail of a comet always points
a. toward the Earth.
b. toward the Sun.
c. away from the Sun.
d. in its direction of motion.
e. opposite to its direction of motion.

48 The Kuiper Belt is mostly located
a. between the orbits of Jupiter and Uranus.
b. beyond the orbit of Neptune.
c. between the orbits of Uranus and Neptune.
d. between the orbits of Mars and Jupiter.

Answer Key: Fall2007 AHX2M

1 Choice a. (all of the other traditional (pre-2006) planets except for Pluto.)
2 Choice b. (ahead of the Moon's motion.)
3 Choice a. (the Oort Cloud.)
4 Choice d. (mantle.)
5 Choice a. (distributed in all directions.)
6 Choice d. (earthquakes occur.)
7 Choice b. (increased because solar activity is greater.)
8 Choice b. (a planet failed to form near Jupiter.)
9 Choice b. (less than 3000kg/m^3 because they are mostly gas.)
10 Choice b. (nowhere in the nebula.)
11 Choice a. (some part of the theory was wrong.)
12 Choice c. (Greenhouse Effect.)
13 Choice c. (1000 to 10,000 meters.)
14 Choice a. (the Solar Wind comes from.)
15 Choice e. (differential rotation and magnetic fields.)
16 Choice c. (solar prominence.)
17 Choice a. (are kicked out of the asteroid belt by Jupiter's gravity.)
18 Choice d. (ionosphere.)
19 Choice a. (maria.)
20 Choice a. (you expect no changes.)
21 Choice c. (the Jovian planets and the Terrestrial planets.)
22 Choice a. (extend far beyond the orbit of Pluto.)
23 Choice a. (is somewhat tilted relative to the plane of the Earth's equator.)
24 Choice c. (0.084amu)
25 Choice c. (1000 times the value.)
26 Choice b. (at high temperatures.)
27 Choice b. (impacts.)
28 Choice c. (when the Moon is overhead and when the Moon is over the opposite side of the Earth.)
29 Choice a. (unusually weak.)
30 Choice c. (blew away the fuel that Jupiter needed to become a star.)
31 Choice d. (four times as thick on the near side and eight times as thick on the far side.)
32 Choice b. (above the central region but well below the surface.)
33 Choice d. (reconnecting magnetic field lines.)
34 Choice c. (deuterons in one step.)
35 Choice c. (collision theory.)
36 Choice e. (a layer of dirt on the lunar surface.)

37 Choice a. (positron.)

38 Choice a. (a rising convection current in the Earth's mantle.)

39 Choice d. (10.)

40 Choice a. (50 meters.)

41 Choice d. (Atlantic Ocean.)

42 Choice c. (greater than 3000kg/m^3 because the Earth has an iron core.)

43 Choice a. (interior structure.)

44 Choice d. (earthquakes.)

45 Choice e. (the Earth passes through comet debris.)

46 Choice c. (twelve and a half hours.)

47 Choice c. (away from the Sun.)

48 Choice b. (beyond the orbit of Neptune.)

Solutions

1 Module 017: Formation of the Solar System: Question 017.13

2 Module 018: The Moon and the Tides: Question 018.41

3 Module 017: Formation of the Solar System: Question 017.41

4 Module 020: Earth and Moon Interiors Question 020.24

5 Module 015: Comets in Detail: Question 015.33

6 Module 021: Continental Drift Question 021.11

7 Module 040: Survey of the Sun Question 040.35

8 Module 017: Formation of the Solar System: Question 017.52

9 Module 014: Solar System Survey: Question 014.32

10 Module 017: Formation of the Solar System: Question 017.21

11 Module 042: Nuclear Fire Question 042.52

12 Module 019: The Earth's Atmosphere Question 019.32

13 Module 016: Earth Impacts: Question 016.32

14 Module 040: Survey of the Sun Question 040.26

15 Module 041: Solar Magnetism and Activity Question 041.21

16 Module 041: Solar Magnetism and Activity Question 041.32

17 Module 016: Earth Impacts: Question 016.11

18 Module 019: The Earth's Atmosphere Question 019.27

19 Module 022: The Earth's Moon Question 022.12

20 Module 019: The Earth's Atmosphere Question 019.13

21 Module 014: Solar System Survey: Question 014.11

22 Module 014: Solar System Survey: Question 014.44

23 Module 022: The Earth's Moon Question 022.43

24 Module 042: Nuclear Fire Question 042.22

25 Module 041: Solar Magnetism and Activity Question 041.13

26 Module 042: Nuclear Fire Question 042.34

27 Module 022: The Earth's Moon Question 022.21

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

29 Module 018: The Moon and the Tides: Question 018.24

30 Module 017: Formation of the Solar System: Question 017.32

31 Module 020: Earth and Moon Interiors Question 020.32

32 Module 040: Survey of the Sun Question 040.12

33 Module 041: Solar Magnetism and Activity Question 041.41

34 Module 042: Nuclear Fire Question 042.41

35 Module 022: The Earth's Moon Question 022.51

36 Module 022: The Earth's Moon Question 022.32

37 Module 042: Nuclear Fire Question 042.15

38 Module 021: Continental Drift Question 021.33

39 Module 016: Earth Impacts: Question 016.43

40 Module 016: Earth Impacts: Question 016.22

41 Module 021: Continental Drift Question 021.22

42 Module 014: Solar System Survey: Question 014.22

43 Module 020: Earth and Moon Interiors Question 020.12

44 Module 021: Continental Drift Question 021.41

45 Module 015: Comets in Detail: Question 015.43

46 Module 018: The Moon and the Tides: Question 018.31

47 Module 015: Comets in Detail: Question 015.11

48 Module 015: Comets in Detail: Question 015.21