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

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

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

4 which of the following particles would be repelled by a proton?
   a. neutron.
   b. electron.
   c. neutrino.
   d. positron.

5 The ion tail of a comet
   a. consists of straight streamers.
   b. is a ball around the nucleus.
   c. shoots out in random directions..
   d. is curved and fuzzy-looking.

6 The side of the Moon that faces away from the Earth
   a. consists almost entirely of lunar maria.
   b. looks exactly like the side that faces the Earth.
   c. has only a few small lunar maria.

7 Underneath a place where the sea floor is spreading, one expects there to be
   a. a bubble in the Earth’s mantle.
   b. a descending convection current in the Earth’s mantle.
   c. a horizontal current in the Earth’s mantle.
   d. a rising convection current in the Earth’s mantle.
   e. a magnetic domain in the Earth’s core.
8 Icy objects were ejected from the inner solar system to form
   a. the Moons of the Jovian planets.
   b. the asteroid belt.
   c. the Oort Cloud.
   d. the Kuiper belt.
   e. the interstellar dust.

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

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

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

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

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

14 If an asteroid that is 50 meters in diameter strikes the Earth, the result is likely to be
   a. negligible.
   b. a planet-wide catastrophe.
   c. similar to a nuclear explosion.

15 In the reaction that powers our Sun, protons collide to make
   a. deuterons in one step.
   b. helium-3 in one step.
   c. helium-4 in one step.
   d. tritium in one step.
   e. carbon in one step.
16 A large asteroid impact causes the extinction of whole species mainly by the effects of the
   a. light and heat: It incinerates them.
   b. noise: It scares them to death.
   c. smoke and dust: It blocks the sunlight.
   d. blast and shock wave: It blows them away.

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

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

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

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

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

22 The Earth’s distance from the Sun is defined to be 1 astronomical unit. Neptune is about 30 astronomical units from the
   Sun. An object in the Oort Cloud might be at a distance from the Sun of
   a. 40,000 astronomical units.
   b. 400 astronomical units.
   c. 40 astronomical units.
   d. 0.5 astronomical units.
   e. 3 astronomical units.
23 Relative to the other layers of the atmosphere, the ionosphere is
   a. at the bottom.
   b. second from the bottom.
   c. at the top.
   d. second from the top.
   e. overlapping two other layers.

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

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

26 The Moon’s core is thought to consist of
   a. a central core of liquid iron and an outer core of solid iron.
   b. a central core of solid iron and an outer core of liquid iron.
   c. iron-rich rock all the way through.
   d. a central core of solid iron and an outer core of semiliquid rock.
   e. a central core of rock and an outer core of iron.

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

28 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 finite speed of gravity.
   c. the effect of the Sun’s gravity.
   d. dragging by the Earth’s magnetic field.
   e. the delayed response of the ocean.

29 A planet with a large system of moons would have to be a
   a. Jovian Planet.
   b. terrestrial planet.
   c. Kuiper Belt object.
30 The temperature of a gas measures the
   a. density of the gas.
   b. volume of the gas.
   c. energy of motion of its atoms or molecules.
   d. number of other states that have the same energy.
   e. sum of all its stored energy.

31 The impacts of large objects on the surface of the Moon have caused
   a. highlands.
   b. scarps.
   c. jumbled terrain.
   d. rift valleys.
   e. craters.

32 The gravitational influence of the planets mostly causes asteroids to
   a. move from the inner solar system to the asteroid belt.
   b. move from the asteroid belt into the inner solar system.
   c. remain in the asteroid belt.
   d. stay out of the inner solar system.

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

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

35 The objects of the Kuiper belt are mostly orbiting
   a. between the orbits of Earth and Mars.
   b. among the Jovian planets.
   c. within the asteroid belt.
   d. beyond all of the Jovian planets.

36 Detecting too few neutrinos from the Sun was a problem because it meant that
   a. the detectors were not working.
   b. government grant money would be lost.
   c. some part of the theory was wrong.
37 The statement that lunar material is much "dryer" than Earth material refers to the absence of
   a. mud.
   b. ice.
   c. liquid water.
   d. hydrated minerals.

38 The radiant of a meteor shower is the
   a. rate at which meteors are seen.
   b. point in the sky the meteors seem to be coming from.
   c. apparent radius of the shower.
   d. angular distance that each meteor travels.
   e. point in the sky the meteors seem to be going toward.

39 Low tide should occur only when the Moon is
   a. over the opposite side of the Earth.
   b. on the horizon.
   c. setting.
   d. rising.
   e. directly overhead.

40 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. 0.002amu
   b. 0.009amu
   c. 0.012amu
   d. 0.006amu
   e. 0.004amu

41 The large objects in our solar system come in
   a. in just two size categories: the Sun and everything else.
   b. in just three size categories, with the Sun as one of them.
   c. in just four size categories, with the Sun as one of them.
   d. a continuous range of sizes.

42 The plane that contains the Earth’s orbit around the Sun is also called the plane of the ecliptic. When you look for planets in the sky, you expect to find
   a. all of them except for Venus near the ecliptic.
   b. all of them except for Neptune near the ecliptic.
   c. all of them except Pluto near the ecliptic.
   d. all of them except for Uranus near the ecliptic.
   e. none of them except for Mars near the ecliptic.

43 The Lunar Regolith is
   a. a rock layer just beneath the lunar surface.
   b. a layer of dirt on the lunar surface.
   c. the layer just above the core.
   d. the soft part of the lunar core.
   e. another name for the lunar crust.
44 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. six hours.
   d. twelve a half hours.
   e. twenty-five hours.

45 The first generally accepted example of Sea-floor spreading was under the
   a. Atlantic Ocean.
   b. English Channel.
   c. Indian Ocean.
   d. Pacific Ocean.
   e. Gulf of Mexico.

46 The year 2001 was a maximum of the sunspot cycle. Another should occur in
   a. 2006.
   c. 2014.
   d. 2010.
   e. 2025.

47 Magnetic fields on the surface of the Sun are measured by observing
   a. interplanetary dust grains.
   b. wavelength shifts in spectral lines.
   c. radar images of the Sun.
   d. X-Ray emissions.
   e. the polarization of sunlight.

48 The possibility that increasing the amount of carbon dioxide in the air will raise the average temperature of the Earth is
   referred to as the
   a. Stark Effect.
   b. creation of the ionosphere.
   c. creation of smog.
   d. destruction of the ozone layer.
   e. Greenhouse Effect.
Answer Key: AHX2P1 Spring 2004

1 Choice b. (earthquakes occur.)
2 Choice c. (are quite common.)
3 Choice e. (finding most dino-killer type asteroids.)
4 Choice d. (positron.)
5 Choice a. (consists of straight streamers.)
6 Choice c. (has only a few small lunar maria.)
7 Choice d. (a rising convection current in the Earth’s mantle.)
8 Choice c. (the Oort Cloud.)
9 Choice d. (nowhere in the nebula.)
10 Choice b. (they sometimes capture moons by accident.)
11 Choice c. (the asteroid belt.)
12 Choice b. (you expect rapid changes.)
13 Choice a. (magnetic lines of force.)
14 Choice c. (similar to a nuclear explosion.)
15 Choice a. (deuterons in one step.)
16 Choice c. (smoke and dust: It blocks the sunlight.)
17 Choice c. (earthquakes.)
18 Choice b. (collision theory.)
19 Choice a. (new moon.)
20 Choice c. (both solids and liquids.)
21 Choice c. (the radiation zone has no atoms with electrons.)
22 Choice a. (40,000 astronomical units.)
23 Choice c. (at the top.)
24 Choice e. (sunspots.)
25 Choice e. (mantle.)
26 Choice c. (iron-rich rock all the way through.)
27 Choice d. (reconnecting magnetic field lines.)
28 Choice a. (friction with the rotating Earth.)
29 Choice a. (Jovian Planet.)
30 Choice c. (energy of motion of its atoms or molecules.)
31 Choice e. (craters.)
32 Choice b. (move from the asteroid belt into the inner solar system.)
33 Choice b. (the Solar Wind comes from.)
34 Choice b. (rock and iron.)
35 Choice d. (beyond all of the Jovian planets.)
36 Choice c. (some part of the theory was wrong.)
37 Choice d. (hydrated minerals.)
38 Choice b. (point in the sky the meteors seem to be coming from.)
39 Choice b. (on the horizon.)
40 Choice b. (0.009amu)
41 Choice b. (in just three size categories, with the Sun as one of them.)
42 Choice c. (all of them except Pluto near the ecliptic.)
43 Choice b. (a layer of dirt on the lunar surface.)
44 Choice d. (twelve a half hours.)
45 Choice a. (Atlantic Ocean.)
46 Choice b. (2023.)
47 Choice b. (wavelength shifts in spectral lines.)
48 Choice e. (Greenhouse Effect.)
Solutions

1. Module 021: Continental Drift Question 021.11
2. Module 017: Formation of the Solar System: Question 017.33
3. Module 016: Earth Impacts: Question 016.41
4. Module 042: Nuclear Fire Question 042.15
5. Module 015: Comets in Detail: Question 015.13
6. Module 022: The Earth’s Moon Question 022.15
7. Module 021: Continental Drift Question 021.33
8. Module 017: Formation of the Solar System: Question 017.41
9. Module 017: Formation of the Solar System: Question 017.21
10. Module 014: Solar System Survey: Question 014.23
11. Module 017: Formation of the Solar System: Question 017.51
12. Module 019: The Earth’s Atmosphere Question 019.14
13. Module 041: Solar Magnetism and Activity Question 041.31
14. Module 016: Earth Impacts: Question 016.21
15. Module 042: Nuclear Fire Question 042.41
17. Module 021: Continental Drift Question 021.41
18. Module 022: The Earth’s Moon Question 022.51
19. Module 018: The Moon and the Tides: Question 018.21
21. Module 040: Survey of the Sun Question 040.14
22. Module 015: Comets in Detail: Question 015.32
23. Module 019: The Earth’s Atmosphere Question 019.28
24. Module 041: Solar Magnetism and Activity Question 041.22
25. Module 020: Earth and Moon Interiors Question 020.24
26. Module 020: Earth and Moon Interiors Question 020.35
27. Module 041: Solar Magnetism and Activity Question 041.41
29. Module 014: Solar System Survey: Question 014.34
30. Module 042: Nuclear Fire Question 042.31
31. Module 022: The Earth’s Moon Question 022.22
33. Module 040: Survey of the Sun Question 040.26
34. Module 014: Solar System Survey: Question 014.41
35. Module 015: Comets in Detail: Question 015.22
36. Module 042: Nuclear Fire Question 042.52