

- 1 Compared to its value elsewhere on the Sun, the magnetic field intensity over a sunspot is found to be about
 - a. the same.
 - b. 1000 times the value.
 - c. 1/1000 the value.
 - d. 1/10 the value.
 - e. ten times the value.

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

- 3 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.

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

- 5 The key argument against the Moon forming from the Earth alone, either by capture of another object or by breakup of a single object is that the Moon's
 - a. core lacks iron.
 - b. orbit is tilted relative to the ecliptic.
 - c. size is very large compared to Earth.
 - d. orbit is tilted relative to Earth's equator.

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

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

- 8 The time from one high tide to the next is lengthened by 24 minutes because of
- the presence of continents blocking the tidal flows.
 - the rotation of the Moon on its axis.
 - the motion of the Moon in its orbit.
 - friction with the Earth.
 - the effects of land tides.
- 9 The layer of the Earth's interior that consists of dense, semiliquid material is the
- crust.
 - mesosphere.
 - outer core.
 - mantle.
 - inner core.
- 10 In the original Solar Nebula, rock, iron, and other metals were lost
- far from the center where it was cool.
 - close to the center where it was hot.
 - everywhere in the nebula.
 - nowhere in the nebula.
- 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 crust.
 - the mantle.
 - none of these because it is solid everywhere.
 - the core.
- 12 As seen from far above the Earth's North Pole,
- no planet orbits the Sun clockwise.
 - no planet orbits the Sun counterclockwise.
 - only Uranus orbits the Sun clockwise.
 - only Uranus orbits the Sun counterclockwise.
- 13 The large objects in our solar system come in
- in just four size categories, with the Sun as one of them.
 - a continuous range of sizes.
 - in just two size categories: the Sun and everything else.
 - in just three size categories, with the Sun as one of them.
- 14 An asteroid whose impact generates a planet-wide catastrophe, changing the climate everywhere, probably has a diameter of about
- 1000 to 10,000 meters.
 - 100,000 meters or larger.
 - 50 meters.
 - 1 to 5 meters.

- 15 Convection currents in the Earth's Mantle
- do not happen because solid rock does not move.
 - are responsible for moving the tectonic plates.
 - happen but do not affect the crust.
 - are responsible for land tides.
 - cause mass extinctions.
- 16 Consider two sunspot pairs, one in the Sun's northern hemisphere and one in the southern hemisphere. As the Sun rotates, one member of each pair leads.
- the leading sunspots are magnetic north poles while the trailing sunspots are magnetic south poles.
 - the pair in the north are magnetic north poles while the pair in the south are south poles.
 - the leading northern sunspot and the trailing southern sunspot are magnetic north poles.
- 17 The idea that neutrinos change from one type to another as they travel is now thought to be
- the answer to the cosmic ray problem.
 - the answer to Ober's Paradox.
 - incorrect.
 - unnecessary.
 - the answer to the solar neutrino problem.
- 18 After a comet's closest approach to the Sun, its tail points
- behind its direction of motion.
 - in all directions at once.
 - ahead of its direction of motion.
 - nowhere.
 - out of the plane of its orbit around the Sun.
- 19 The Asteroid Belt lies between the orbits of
- Venus and Earth.
 - Earth and Mars.
 - Jupiter and Saturn.
 - Mars and Jupiter.
 - Neptune and Pluto.
- 20 The gravitational influence of the planets mostly causes asteroids to
- move from the inner solar system to the asteroid belt.
 - stay out of the inner solar system.
 - move from the asteroid belt into the inner solar system.
 - remain in the asteroid belt.
- 21 The Lunar Regolith is
- the soft part of the lunar core.
 - another name for the lunar crust.
 - the layer just above the core.
 - a layer of dirt on the lunar surface.
 - a rock layer just beneath the lunar surface.

- 22 The Oort Cloud is thought to have originated when
- icy objects condensed out of the interstellar medium.
 - icy objects condensed out in the inner Solar System.
 - a planet failed to form near Jupiter.
 - icy objects condensed out just beyond Neptune.
 - nearby stars exploded as supernovae.
- 23 A solar flare appears on the Sun's surface as
- the expulsion of the entire solar atmosphere.
 - a pair of dark spots.
 - a rising arch of glowing gas.
 - an explosion and jet of ejected material.
 - a burst of neutrinos.
- 24 When the number of sunspots is greatest, the energy output of the Sun is
- increased because solar activity is greater.
 - unaffected because the spots are small.
 - decreased because the spots radiate less.
- 25 The epicenters of earthquakes are located
- mostly in the centers of oceans.
 - mostly along continental boundaries.
 - mostly near the Earth's equator.
 - at random places on the Earth's surface.
 - mostly along the edges of moving plates.
- 26 The current effort to defend the Earth against space impacts consists of
- re-directing Star-Wars anti-missile weapons.
 - finding most dino-killer type asteroids.
 - finding places to hide..
 - building a space-patrol fleet of asteroid-killers.
 - finding most near-Earth asteroids.
- 27 The important difference between matter in the radiation zone and matter in the convection zone is that
- the convection zone is farther from the center.
 - the convection zone has no atoms with electrons.
 - the convection zone is hotter.
 - the convection zone is closer to the center.
 - the convection zone has atoms with electrons.
- 28 The highest altitude layer of the atmosphere is the
- ozone layer.
 - troposphere.
 - stratosphere.
 - ionosphere.
 - mesosphere.

- 29 Pressure waves are transmitted through
- solids but not liquids.
 - liquids but not solids.
 - both solids and liquids.
- 30 The average energy of motion of an atom or molecule in a gas is called its
- entropy.
 - density.
 - temperature.
 - speed.
 - frequency.
- 31 Solar prominences are lifted out of the Sun's surface by
- magnetic lines of force.
 - convection currents.
 - electric lines of force.
 - gravity.
 - centrifugal force.
- 32 The most likely candidate for a second star in our Solar system was
- the planet Mercury.
 - the planet Jupiter.
 - the planet Pluto.
 - the planet Earth.
 - the planet Mars.
- 33 When tectonic plates move past each other, they usually cause
- tornados.
 - earthquakes.
 - floods.
 - forest fires.
 - hurricanes.
- 34 The photosphere is a layer of the Sun that
- is visible only during eclipses.
 - attracts photons.
 - emits most sunlight.
 - absorbs most photons.
 - gives rise to the Solar Wind.
- 35 The Moon's rotates on its axis
- once a day.
 - once a year.
 - not at all.
 - once in 250 million years.
 - once a month..

- 36 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?
- 0.012amu
 - 0.004amu
 - 0.009amu
 - 0.002amu
 - 0.006amu
- 37 Which of the following particles has the smallest mass?
- deuteron.
 - neutron.
 - neutrino.
 - proton.
 - positron.
- 38 A neap tide can be expected when there is a
- waxing crescent moon.
 - waning crescent moon.
 - waxing gibbous moon
 - new moon.
 - first quarter moon.
- 39 The jovian planets typically have
- no moons.
 - large systems of moons.
 - only moons that they capture by accident.
- 40 When the Earth passes through the orbit of a broken-up comet, we see
- a lightning storm.
 - a meteor shower.
 - a display of Northern Lights.
 - fire on the Moon.
 - increased levels of ozone.
- 41 The side of the Moon that faces away from the Earth
- consists almost entirely of lunar maria.
 - has only a few small lunar maria.
 - looks exactly like the side that faces the Earth.
- 42 The first generally accepted example of Sea-floor spreading was under the
- Pacific Ocean.
 - Indian Ocean.
 - English Channel.
 - Atlantic Ocean.
 - Gulf of Mexico.

- 43 Current theory says that the Moon formed when
- the Earth captured another planet.
 - a comet collided with the Earth.
 - the earth rotated fast enough to break up.
 - another planet collided with the Earth.
 - an asteroid collided with the Earth.
- 44 The density of water is 1000kg/m^3 while the density of iron is 7800kg/m^3 . Which of the following values is a plausible value for the density of a terrestrial planet?
- $10,000\text{kg/m}^3$
 - 500kg/m^3
 - $20,000\text{kg/m}^3$
 - 1000kg/m^3
 - 5000kg/m^3
- 45 In the reaction that powers our Sun, protons collide to make
- deuterons in one step.
 - helium-4 in one step.
 - tritium in one step.
 - helium-3 in one step.
 - carbon in one step.
- 46 The impacts of large objects on the surface of the Moon have caused
- jumbled terrain.
 - highlands.
 - craters.
 - scarps.
 - rift valleys.
- 47 High tide should occur
- when the Moon is rising.
 - only when the Moon is over the opposite side of the Earth.
 - when the Moon is setting.
 - when the Moon is overhead and when the Moon is over the opposite side of the Earth.
 - only when the Moon is overhead.
- 48 The objects of the Kuiper belt are mostly orbiting
- within the asteroid belt.
 - among the Jovian planets.
 - beyond all of the Jovian planets.
 - between the orbits of Earth and Mars.

Answer Key: AHX2P2 Spring 2004

- 1 Choice b. (1000 times the value.)
- 2 Choice b. (a planet failed to form near Jupiter.)
- 3 Choice a. (50 meters.)
- 4 Choice c. (distributed in all directions.)
- 5 Choice d. (orbit is tilted relative to Earth's equator.)
- 6 Choice a. (you expect no changes.)
- 7 Choice c. (the absorption of infrared light by gases in the atmosphere.)
- 8 Choice c. (the motion of the Moon in its orbit.)
- 9 Choice d. (mantle.)
- 10 Choice d. (nowhere in the nebula.)
- 11 Choice c. (the mantle.)
- 12 Choice a. (no planet orbits the Sun clockwise.)
- 13 Choice d. (in just three size categories, with the Sun as one of them.)
- 14 Choice a. (1000 to 10,000 meters.)
- 15 Choice b. (are responsible for moving the tectonic plates.)
- 16 Choice c. (the leading northern sunspot and the trailing southern sunspot are magnetic north poles.)
- 17 Choice e. (the answer to the solar neutrino problem.)
- 18 Choice c. (ahead of its direction of motion.)
- 19 Choice d. (Mars and Jupiter.)
- 20 Choice c. (move from the asteroid belt into the inner solar system.)
- 21 Choice d. (a layer of dirt on the lunar surface.)
- 22 Choice b. (icy objects condensed out in the inner Solar System.)
- 23 Choice d. (an explosion and jet of ejected material.)
- 24 Choice a. (increased because solar activity is greater.)
- 25 Choice e. (mostly along the edges of moving plates.)
- 26 Choice b. (finding most dino-killer type asteroids.)
- 27 Choice e. (the convection zone has atoms with electrons.)
- 28 Choice d. (ionosphere.)
- 29 Choice c. (both solids and liquids.)
- 30 Choice c. (temperature.)
- 31 Choice a. (magnetic lines of force.)
- 32 Choice b. (the planet Jupiter.)
- 33 Choice b. (earthquakes.)
- 34 Choice c. (emits most sunlight.)
- 35 Choice e. (once a month..)
- 36 Choice c. (0.009amu)

- 37 Choice c. (neutrino.)
- 38 Choice e. (first quarter moon.)
- 39 Choice b. (large systems of moons.)
- 40 Choice b. (a meteor shower.)
- 41 Choice b. (has only a few small lunar maria.)
- 42 Choice d. (Atlantic Ocean.)
- 43 Choice d. (another planet collided with the Earth.)
- 44 Choice e. (5000kg/m^3)
- 45 Choice a. (deuterons in one step.)
- 46 Choice c. (craters.)
- 47 Choice d. (when the Moon is overhead and when the Moon is over the opposite side of the Earth.)
- 48 Choice c. (beyond all of the Jovian planets.)

Solutions

- 1 Module 041: Solar Magnetism and Activity Question 041.13
- 2 Module 017: Formation of the Solar System: Question 017.52
- 3 Module 016: Earth Impacts: Question 016.22
- 4 Module 015: Comets in Detail: Question 015.33
- 5 Module 022: The Earth's Moon Question 022.44
- 6 Module019: The Earth's Atmosphere Question 019.13
- 7 Module019: The Earth's Atmosphere Question 019.31
- 8 Module 018: The Moon and the Tides: Question 018.32
- 9 Module020: Earth and Moon Interiors Question 020.24
- 10 Module 017: Formation of the Solar System: Question 017.21
- 11 Module020: Earth and Moon Interiors Question 020.34
- 12 Module 017: Formation of the Solar System: Question 017.12
- 13 Module 014: Solar System Survey: Question 014.12
- 14 Module 016: Earth Impacts: Question 016.32
- 15 Module 021: Continental Drift Question 021.32
- 16 Module 041: Solar Magnetism and Activity Question 041.23
- 17 Module 042: Nuclear Fire Question 042.54
- 18 Module 015: Comets in Detail: Question 015.12
- 19 Module 014: Solar System Survey: Question 014.43
- 20 Module 016: Earth Impacts: Question 016.12
- 21 Module 022: The Earth's Moon Question 022.32
- 22 Module 017: Formation of the Solar System: Question 017.42
- 23 Module 041: Solar Magnetism and Activity Question 041.43
- 24 Module 040: Survey of the Sun Question 040.35
- 25 Module 021: Continental Drift Question 021.12
- 26 Module 016: Earth Impacts: Question 016.41
- 27 Module 040: Survey of the Sun Question 040.13
- 28 Module019: The Earth's Atmosphere Question 019.27
- 29 Module020:Earth and Moon Interiors Question 020.13
- 30 Module 042: Nuclear Fire Question 042.32
- 31 Module 041: Solar Magnetism and Activity Question 041.31
- 32 Module 017: Formation of the Solar System: Question 017.34
- 33 Module 021: Continental Drift Question 021.41
- 34 Module 040: Survey of the Sun Question 040.22
- 35 Module 018: The Moon and the Tides: Question 018.43
- 36 Module 042: Nuclear Fire Question 042.21

- 37 Module 042: Nuclear Fire Question 042.13
- 38 Module 018: The Moon and the Tides: Question 018.23
- 39 Module 014: Solar System Survey: Question 014.33
- 40 Module 015: Comets in Detail: Question 015.44
- 41 Module 022: The Earth's Moon Question 022.15
- 42 Module 021: Continental Drift Question 021.22
- 43 Module 022: The Earth's Moon Question 022.52
- 44 Module 014: Solar System Survey: Question 014.21
- 45 Module 042: Nuclear Fire Question 042.41
- 46 Module 022: The Earth's Moon Question 022.22
- 47 Module 018: The Moon and the Tides: Question 018.11
- 48 Module 015: Comets in Detail: Question 015.22