

MULTIPLE CHOICE

1. If one were to see a comet passing by Earth, it is likely that this comet originated from _____.
- | | |
|----------------------|-------------------------|
| a. the asteroid belt | c. a neighboring galaxy |
| b. the Kuiper belt | d. interplanetary space |

ANS: B

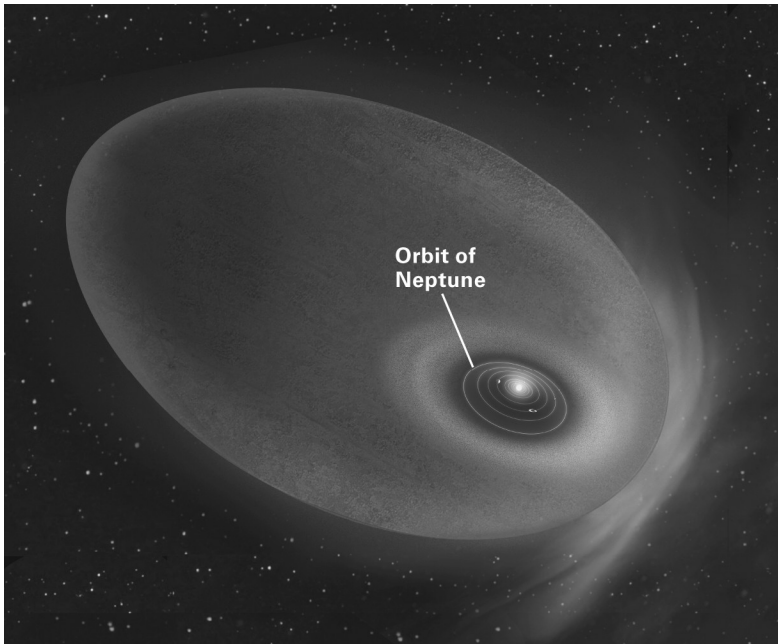
DIF: Easy

REF: 2.2

TOP: 1

MSC: Applying

2. The region of space that contains all of the material of our Solar System (shown below) is termed the _____.



- a. Kuiper belt
b. heliosphere
- c. cryosphere
d. Oort cloud

ANS: B

DIF: Easy

REF: 2.2

TOP: 1

MSC: Remembering

3. Where can icy bodies left over from the protoplanetary disk that formed our Solar System long after the Big Bang be found?
- a. heliosphere
 - b. Oort cloud
 - c. Kuiper belt
 - d. interplanetary space

ANS: C

DIF: Medium

REF: 2.2

TOP: 1

MSC: Applying

4. Which of the following is **NOT** true about comets and asteroids?
- a. Comets are icy while asteroids are rocky.
 - b. Both are planetesimals.
 - c. Both are numerous in our Solar System.
 - d. Both originate in the Kuiper belt.

ANS: D

DIF: Medium

REF: 2.2

TOP: 1

MSC: Analyzing

5. The shape of Earth's magnetic field is approximately that of a _____.
a. monopole, as would be produced by just one pole of a magnet
b. dipole, such as that produced by a bar magnet
c. torus, a doughnut-shaped ring parallel to Earth's equator
d. sphere, following the shape of Earth

ANS: B

DIF: Easy

REF: 2.2

TOP: 2

MSC: Remembering

6. Presently, Earth's atmosphere is dominated by which two gases?
a. hydrogen and helium
b. oxygen and carbon dioxide
c. nitrogen and oxygen
d. carbon dioxide and sulfur dioxide

ANS: C

DIF: Easy

REF: 2.2

TOP: 2

MSC: Remembering

7. If one were to ride a hot air balloon up into the atmosphere, one would experience the concentration of gases _____.
a. becoming denser
b. becoming less dense
c. remaining the same
d. increasing for the first 10 km, then starting to decline

ANS: B

DIF: Medium

REF: 2.2

TOP: 2

MSC: Applying

8. Earth's surface is protected from solar wind and cosmic radiation by _____.
a. Earth's gravitational field
b. Earth's magnetic field
c. a large, metallic shield launched into orbit by NASA in the 1960s
d. a powerful stream of ions emitted by the Sun

ANS: B

DIF: Medium

REF: 2.2

TOP: 2

MSC: Understanding

9. An aurora (shown below) is produced when _____.



- a. solar wind particles are directed toward the magnetic poles and excite atmospheric gases
b. swamp gases rise from the arctic tundra and react with the upper atmosphere
c. radiation in the Van Allen belts can be seen on a clear, cold night

d. lightning travels from cloud to cloud rather than cloud to ground

ANS: A DIF: Medium REF: 2.2 TOP: 2
MSC: Applying

10. The atmosphere is divided into several distinct layers. Beginning with the layer in which we live, they are, in order, _____.
- stratosphere, troposphere, mesosphere, and thermosphere
 - troposphere, stratosphere, thermosphere, and mesosphere
 - troposphere, stratosphere, mesosphere, and thermosphere
 - stratosphere, troposphere, thermosphere, and mesosphere

ANS: C DIF: Difficult REF: 2.2 TOP: 2
MSC: Remembering

11. Substances that can be transformed to a gas at relatively low temperatures are termed _____.
- glasses
 - melts
 - volatiles
 - mineraloids

ANS: C DIF: Easy REF: 2.3 TOP: 3
MSC: Remembering

12. Most continental topography lies within a range of altitude between _____.
- sea level and 1 km below sea level
 - sea level and 1 km above sea level
 - 2 to 5 km above sea level
 - 3 to 6 km above sea level

ANS: B DIF: Medium REF: 2.3 TOP: 3
MSC: Remembering

13. The most common minerals within Earth are _____.
- silicates
 - carbonates
 - oxides
 - hydroxides

ANS: A DIF: Easy REF: 2.3 TOP: 3
MSC: Remembering

14. Hot, liquid rock beneath Earth's surface is termed _____.
- lava
 - magma
 - volatiles
 - mantle

ANS: B DIF: Easy REF: 2.3 TOP: 3
MSC: Remembering

15. Which of the following is **NOT** required for a substance to be considered a mineral?
- It must be solid.
 - It must be naturally occurring.
 - It must contain carbon.
 - It must have atoms arranged in an orderly pattern.

ANS: C DIF: Easy REF: 2.3 TOP: 3
MSC: Understanding

16. Most of the ocean floor is made up of _____.
- deep-ocean trenches (8 to 11 km below sea level)
 - abyssal plains (4 to 5 km below sea level)
 - mid-ocean ridges (less than 2.5 km below sea level)

d. Elevations of the sea floor are nearly uniformly distributed from sea level to 11 km depth.

ANS: B DIF: Medium REF: 2.3 TOP: 3
MSC: Analyzing

17. Which of the following is most representative of Earth's hydrosphere?

- a. lakes and rivers only
- b. surficial freshwater, oceans, groundwater, and atmospheric water
- c. a layer of hydrogen gas in the outer reaches of the atmosphere
- d. oceans, but not rivers or lakes

ANS: B DIF: Medium REF: 2.3 TOP: 3
MSC: Applying

18. In the whole Earth, the four most common elements (by mass) are oxygen, silicon, magnesium, and _____.

- a. copper
- b. lead
- c. iron
- d. zinc

ANS: C DIF: Medium REF: 2.3 TOP: 3
MSC: Remembering

19. If you were measuring the elevation of a mountain, you would be measuring variation in _____, whereas if you were doing the same on a mid-ocean ridge, you would be measuring variation in _____.

- a. bathymetry; topography
- b. bathymetry; isostasy
- c. topography; isostasy
- d. topography; bathymetry

ANS: D DIF: Easy REF: 2.3 TOP: 3
MSC: Applying

20. Glass is different from a mineral because it _____.

- a. is not naturally occurring
- b. is not a solid
- c. does not have atoms arranged in an orderly pattern
- d. contains carbon and is therefore organic

ANS: C DIF: Medium REF: 2.3 TOP: 3
MSC: Understanding

21. Which of the following is **NOT** an example of sediment?

- a. sand
- b. ground-up seashells
- c. cobblestones on a beach
- d. sandstone

ANS: D DIF: Easy REF: 2.3 TOP: 3
MSC: Applying

22. A mixture of copper and tin would be called a(n) _____.

- a. metal
- b. alloy
- c. melt
- d. volatile

ANS: B DIF: Easy REF: 2.3 TOP: 3
MSC: Applying

23. A silica-rich igneous rock that has large crystals and makes up much of the continental crust is _____.

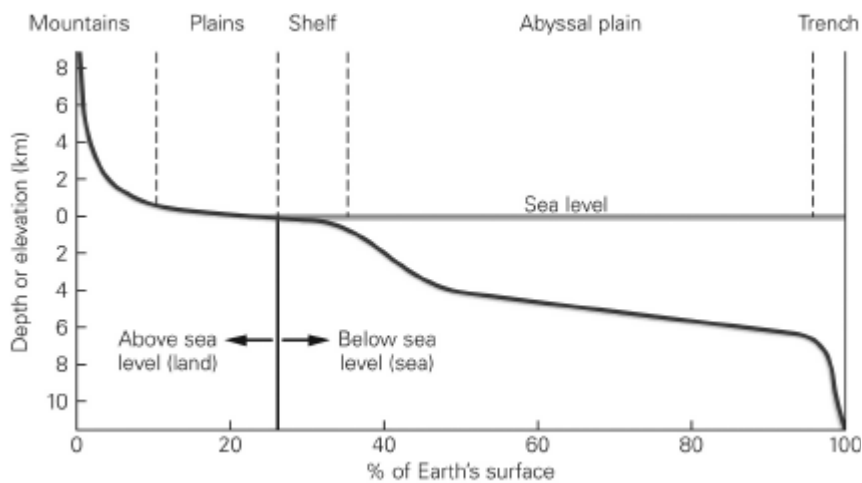
- a. peridotite
- b. granite
- c. gabbro
- d. basalt

ANS: B DIF: Easy REF: 2.3 TOP: 3
 MSC: Remembering

24. The density of rocks is generally related to composition. Which of the following choices places rock compositions in order of increasing density?
- a. felsic, intermediate, ultramafic, mafic
 - b. ultramafic, mafic, intermediate, felsic
 - c. felsic, intermediate, mafic, ultramafic
 - d. mafic, ultramafic, intermediate, felsic

ANS: C DIF: Difficult REF: 2.3 TOP: 3
 MSC: Applying

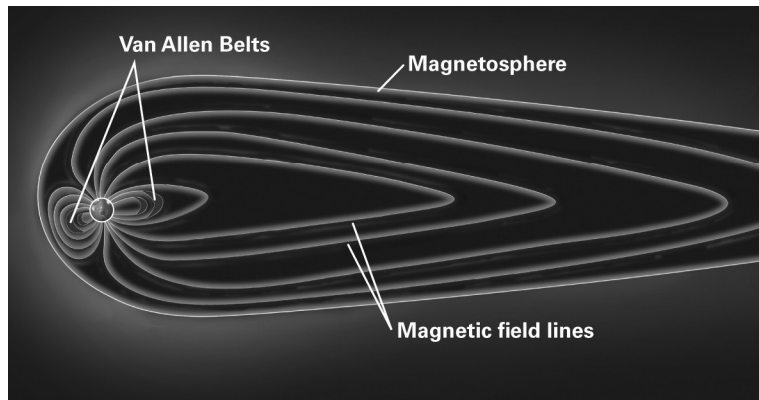
25. The figure below shows the hypsometric curve for Earth. Which of the following can be concluded from the plot of this data?



- a. Regions of high elevation (> 4 km) are common on Earth.
- b. Most of the continents are between 0 and 1 km above sea level.
- c. Elevations of -10 km to 8 km are nearly uniformly distributed across Earth's surface.
- d. Most of the sea floor is more than 6 km below sea level.

ANS: B DIF: Difficult REF: 2.3 TOP: 3
 MSC: Analyzing

26. The image below shows Earth's magnetic field. Earth's magnetic field lines are distorted (i.e., not symmetrical) because _____.



- a. Earth is rapidly rotating around the Sun
- b. Earth is rotating on an internal axis
- c. convection is occurring in the outer core
- d. solar wind deflects Earth's magnetic field lines

ANS: D DIF: Difficult REF: 2.3 TOP: 3
 MSC: Understanding

27. Which of the following is **NOT** true concerning the rocks gabbro and basalt?
- a. Both are common in the oceanic crust.
 - b. Both have small grains/crystals.
 - c. Both are igneous rocks.
 - d. Both are denser than granite.

ANS: B DIF: Difficult REF: 2.3 TOP: 3
 MSC: Applying

28. Which of the following lists compositions in order of increasing silica content?
- a. felsic, intermediate, ultramafic, mafic
 - b. ultramafic, mafic, intermediate, felsic
 - c. felsic, intermediate, mafic, ultramafic
 - d. mafic, ultramafic, intermediate, felsic

ANS: B DIF: Difficult REF: 2.3 TOP: 3
 MSC: Understanding

29. In general, seismic (earthquake-generated) waves travel _____ in the mantle compared to the shallow crust.
- a. faster
 - b. slower
 - c. at the same velocity
 - d. Seismic waves do not travel through the mantle.

ANS: A DIF: Medium REF: 2.4 TOP: 4
 MSC: Understanding

30. A fracture in the crust, where rocks slide past one another, is termed a _____.
- a. fold
 - b. fault
 - c. sliding layer
 - d. joint

ANS: B DIF: Easy REF: 2.4 TOP: 4
 MSC: Remembering

31. Earth's geothermal gradient is the rate of temperature change incurred by _____.
a. increasing altitude in the atmosphere
b. increasing depth at ocean trenches
c. traversing from either pole toward the equator
d. traversing down within Earth's interior

ANS: D

DIF: Easy

REF: 2.4

TOP: 4

MSC: Remembering

32. During a journey to the center of the Earth, one would experience temperature _____.
a. and pressure both increasing
b. and pressure both decreasing
c. increasing, but pressure staying nearly the same
d. remaining remarkably constant, but pressure increasing

ANS: A

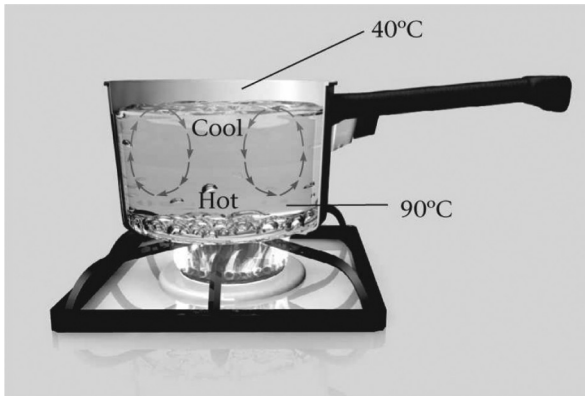
DIF: Easy

REF: 2.4

TOP: 4

MSC: Understanding

33. The image below shows an example of which type of heat transfer?



- a. radiation
b. conduction
c. convection
d. advection

ANS: C

DIF: Easy

REF: 2.5

TOP: 4

MSC: Understanding

34. The densest layer of Earth is the _____.
a. crust
b. mantle
c. outer core
d. inner core

ANS: D

DIF: Easy

REF: 2.5

TOP: 4

MSC: Remembering

35. Compared to oceanic crust, continental crust is _____.
a. thicker
b. thinner
c. about the same thickness
d. Sometimes continental crust is thicker; sometimes oceanic crust is thicker. There is no consistent pattern.

ANS: A

DIF: Easy

REF: 2.5

TOP: 4

MSC: Understanding

36. The thickness of Earth's crust varies from _____.

- a. 100 to 500 m
- b. 1 to 10 km
- c. 5 to 500 km
- d. 7 to 70 km

ANS: D DIF: Medium REF: 2.5 TOP: 4
 MSC: Remembering

37. Of the three primary compositional layers of the Earth (crust, mantle, core), which is the thickest layer?
- a. crust
 - b. mantle
 - c. core
 - d. The mantle and core are the same thickness.

ANS: C DIF: Difficult REF: 2.5 TOP: 4
 MSC: Understanding

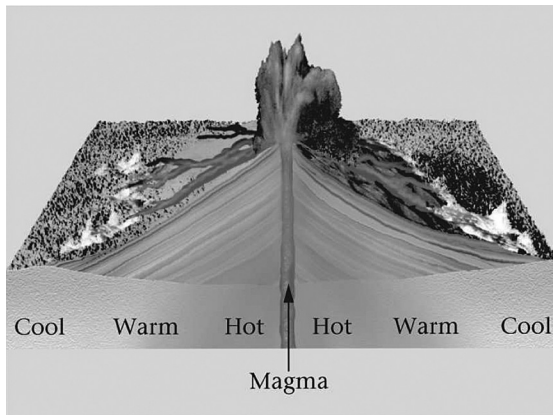
38. The Moho _____.
- a. lies at uniform depth everywhere it is found in Earth
 - b. is found deeper underneath continents than under oceans
 - c. is found deeper underneath oceans than under continents
 - d. is found well below the crust/mantle boundary

ANS: B DIF: Easy REF: 2.5 TOP: 4
 MSC: Applying

39. When you are warmed by the Sun, you are experiencing _____; when you burn yourself touching a metal object whose other end is being heated you are experiencing _____.
- a. advection; conduction
 - b. radiation; conduction
 - c. radiation; convection
 - d. advection; convection

ANS: B DIF: Medium REF: 2.5 TOP: 4
 MSC: Applying

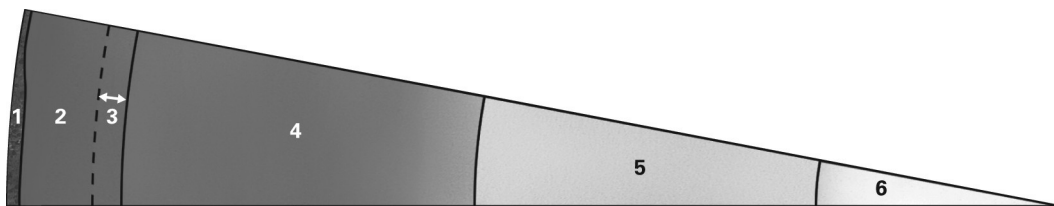
40. The image below shows _____, where a hot liquid rises into a cooler material, and heat then conducts from the hot liquid into the cooler material.



- a. advection
- b. conduction
- c. convection
- d. radiation

ANS: A DIF: Difficult REF: 2.5 TOP: 4
 MSC: Understanding

41. From left to right, correctly label each section of this slice of the Earth. Note that 1 starts at the surface of the Earth and 6 ends at the center of the Earth.



- crust, liquid outer core, transition zone, solid inner core, upper mantle, lower mantle
- crust, upper mantle, transition zone, lower mantle, liquid outer core, solid inner core
- crust, transition zone, upper mantle, lower mantle, liquid outer core, solid inner core
- transition zone, crust, liquid outer core, solid inner core, upper mantle, lower mantle

ANS: B DIF: Medium REF: 2.5 TOP: 4
MSC: Analyzing

42. As compared to the rocks that make up the crust, Earth as a whole is _____.
 a. considerably more dense c. slightly less dense
 b. considerably less dense d. about the same density

ANS: A DIF: Medium REF: 2.5 TOP: 4
MSC: Applying

43. The velocities of seismic waves traveling from earthquake foci _____.
 a. are uniform throughout all layers of Earth
 b. decrease at a constant rate with depth
 c. increase at a constant rate with depth
 d. generally increase with depth, but occasionally make abrupt jumps

ANS: D DIF: Medium REF: 2.5 TOP: 4
MSC: Understanding

44. The boundary between the crust and the mantle is marked by an abrupt change in seismic velocity called the _____.
 a. transition zone c. low-velocity zone
 b. Moho d. crantle

ANS: B DIF: Easy REF: 2.5 TOP: 4
MSC: Understanding

45. Earth's magnetic field is generated by the _____.
 a. flow of the liquid inner core c. convective flow of the mantle
 b. flow of the liquid outer core d. magnetic minerals within the crust

ANS: B DIF: Medium REF: 2.5 TOP: 4
MSC: Applying

46. Which of the following statements about Earth's core is **NOT** true?
 a. Its metallic content is likely similar to what has been found in metallic meteorites.
 b. It is partly liquid and partly solid.
 c. It is composed of an iron alloy (mostly iron with a few other metallic elements mixed in).
 d. By volume, it is the largest compositional layer of the Earth.

ANS: D DIF: Medium REF: 2.5 TOP: 4
MSC: Analyzing

47. As compared to ultramafic rocks, mafic rocks have a _____.
a. greater proportion of silica
b. lesser proportion of silica
c. greater proportion of iron and magnesium atoms
d. greater density

ANS: A DIF: Medium REF: 2.5 TOP: 4
MSC: Applying

48. In general, the mantle is made of the rock _____ and has a(n) _____ composition.
a. granite; intermediate c. gabbro; mafic
b. basalt; mafic d. peridotite; ultramafic

ANS: D DIF: Medium REF: 2.5 TOP: 4
MSC: Understanding

49. The lithosphere is composed of the _____.
a. crust only
b. crust, mantle, and outer core
c. top 100 m of sediments and sedimentary rocks
d. crust and the uppermost part of the mantle

ANS: D DIF: Easy REF: 2.6 TOP: 5
MSC: Remembering

50. The lithosphere lies directly above the _____.
a. transition zone c. asthenosphere
b. crust d. lower mantle

ANS: C DIF: Easy REF: 2.6 TOP: 5
MSC: Understanding

51. The distinction between the crust and the mantle is primarily on the basis of a difference in _____; the distinction between the lithosphere and the asthenosphere is primarily on the basis of a difference in _____.
a. composition; the ability to flow without breaking
b. color; composition
c. the ability to flow without breaking; composition
d. composition; composition as well

ANS: A DIF: Medium REF: 2.6 TOP: 5
MSC: Understanding

52. As compared to the asthenosphere, the lithosphere is _____.
a. cooler and more able to flow c. cooler and less able to flow
b. hotter and more able to flow d. hotter and less able to flow

ANS: C DIF: Medium REF: 2.6 TOP: 5
MSC: Applying