Introduction to Environmental Geology, 5e **(Keller)**
Chapter 2 Internal Structure of Earth and Plate Tectonics

2.1 Multiple-Choice Questions

1) What is the principal difference between the inner core and outer core?
A) The inner core consists mainly of iron and nickel, while the outer core consists mainly of silicate minerals.
B) The inner core consists mainly of silicate minerals, while the outer core consists mainly of iron and nickel.
C) The inner core is solid while the outer core is liquid.
D) The inner core is liquid while the outer core is solid.
Answer: D
Diff: 2 Page Ref: 32
Section Number: 2.1
Bloom's Taxonomy: Understanding

2) The Mohorovicic discontinuity represents
A) the boundary between inner and outer cores
B) the boundary between mantle and crust
C) the boundary between lithosphere and hydrosphere
D) the boundary between outer core and mantle
Answer: B
Diff: 2 Page Ref: 34
Section Number: 2.1
Bloom's Taxonomy: Remembering

3) How does the lithosphere differ from the asthenosphere?
A) The lithosphere is stronger than the asthenosphere.
B) The asthenosphere is stronger than the lithosphere.
C) The asthenosphere is part of the core, while the lithosphere is part of the mantle.
D) The asthenosphere is less dense than the lithosphere.
Answer: A
Diff: 3 Page Ref: 34
Section Number: 2.1
Bloom's Taxonomy: Understanding

4) Which type of earthquake wave moves fastest?
A) P-wave
B) S-wave
C) L-wave
D) R-wave
Answer: A
Diff: 1 Page Ref: 35
Section Number: 2.2
Bloom's Taxonomy: Remembering

5) How do seismologists know the outer core is liquid?
A) P-waves are refracted upon arrival in the outer core
B) S-waves are absorbed upon arrival in the outer core
C) both S-waves and P-waves speed up in the outer core
D) both S-waves and P-waves slow down in the outer core
Answer: B
Diff: 2 Page Ref: 37
Section Number: 2.2
Bloom's Taxonomy: Understanding

6) Why was Alfred Wegener's hypothesis of continental drift not taken seriously by most geologists?
A) his evidence for former joining of the continents was faulty
B) because it was and is known that continents do not move
C) his mechanism for movement of the continents was faulty
D) he was not a well-respected scientist
Answer: C
Diff: 2 Page Ref: 38
Section Number: 2.3
Bloom's Taxonomy: Understanding

7) How did seafloor spreading revive Alfred Wegener's ideas about continental drift?
A) Sea floor spreading relied on new fossil evidence documenting the former joining of the continents.
B) Sea floor spreading provided an explanation for the consumption of oceanic crust at plate boundaries.
C) The topography of the ocean floor demonstrated that mountain ranges on either side of the Atlantic Ocean were formerly joined.
D) Sea floor spreading prevented a viable mechanism for moving the continents.
Answer: D
Diff: 3 Page Ref: 38
Section Number: 2.3
Bloom's Taxonomy: Understanding

8) At convergent plate boundaries
A) the plate of higher density subducts into the mantle
B) the plate of lower density subducts into the mantle
C) new oceanic crust is created
D) magnetic stripes are generated in oceanic rocks
Answer: B
Diff: 1 Page Ref: 41
Section Number: 2.3
Bloom's Taxonomy: Understanding

9) Transform plate boundaries are marked by
A) volcanic island arcs
B) consumption of oceanic crust
C) creation of oceanic crust
D) two plates sliding relative to one another
Answer: D
Diff: 2 Page Ref: 44
Section Number: 2.3
Bloom's Taxonomy: Understanding

10) How do magnetic stripes on the ocean floor serve as evidence for seafloor spreading?
A) Their symmetry on either side of the mid-ocean ridge shows that new crust is created, then split.
B) Their patterns show that the Earth's magnetic field reverses every few hundred years, on average.
C) They show that island arc volcanism creates new oceanic crust at the mid-ocean ridges.
D) Their symmetry on either side of mid-ocean ridges shows that transform boundaries are sliding boundaries.
Answer: A
Diff: 3 Page Ref: 47
Section Number: 2.4
Bloom's Taxonomy: Understanding

11) Hot spots are recorded by
A) extensive earthquake hazards
B) mantle rock exposed at the Earth's surface
C) rock from the outer mantle included in volcanic rocks
D) a sequence of volcanic centers younging toward the hot spot
Answer: A
Diff: 3 Page Ref: 49
Section Number: 2.4
Bloom's Taxonomy: Applying

12) The process of isostasy is responsible for
A) moving plates apart at a divergent margin
B) creating volcanoes at a hot spot
C) causing rock uplift in mountain ranges in response to erosion
D) causing compressive stresses at convergent boundaries
Answer: C
Diff: 3 Page Ref: 42
Section Number: 2.3
Bloom's Taxonomy: Understanding

13) Tectonic plates move about as fast as
A) a car moves on a city street
B) fingernails grow
C) a swallow flies
D) a tortoise walks
Answer: B
Diff: 1 Page Ref: 45
Section Number: 2.3
Bloom's Taxonomy: Remembering

14) When did the supercontinent Pangaea start breaking apart?
A) 4.6 billion years ago
B) 560 million years ago
C) 180 million years ago
D) 65 million years ago
Answer: C
Diff: 2 Page Ref: 50
Section Number: 2.5
Bloom's Taxonomy: Remembering

15) What driving force of plate movement is likely dominant?
A) ridge push
B) slab pull
C) mountain rise
D) valley fall
Answer: B
Diff: 1 Page Ref: 56
Section Number: 2.6
Bloom's Taxonomy: Understanding

2.2 True/False Questions

1) The rocks of the core are more dense than the rocks of the mantle.
Answer: TRUE
Diff: 1 Page Ref: 33
Section Number: 2.1
Bloom's Taxonomy: Remembering

2) The asthenosphere is stronger than the lithosphere.
Answer: FALSE
Diff: 2 Page Ref: 34
Section Number: 2.1
Bloom's Taxonomy: Remembering

3) S-waves accelerate as they enter the outer core.
Answer: FALSE
Diff: 2 Page Ref: 35
Section Number: 2.2
Bloom's Taxonomy: Understanding

4) Alfred Wegener proposed the idea of sea floor spreading.
Answer: FALSE
Diff: 1 Page Ref: 38
Section Number: 2.3
Bloom's Taxonomy: Understanding

5) Crust is consumed at transform boundaries.
Answer: FALSE
Diff: 2 Page Ref: 44
Section Number: 2.3
Bloom's Taxonomy: Remembering

6) A submarine trench is associated with a convergent boundary.
Answer: TRUE
Diff: 1 Page Ref: 44
Section Number: 2.3
Bloom's Taxonomy: Remembering

7) The Earth's magnetic field reverses in a regular pattern every few hundred thousand years.
Answer: FALSE
Diff: 2 Page Ref: 47
Section Number: 2.3
Bloom's Taxonomy: Remembering

8) The concept of seafloor spreading was supported by magnetic polarity stripes on the ocean floor.
Answer: TRUE
Diff: 1 Page Ref: 48
Section Number: 2.4
Bloom's Taxonomy: Understanding

9) The Hawaiian Islands are a volcanic arc atop an oceanic subduction zone.
Answer: FALSE
Diff: 2 Page Ref: 49
Section Number: 2.4
Bloom's Taxonomy: Understanding

10) Plate tectonic processes can affect climate.
Answer: TRUE
Diff: 1 Page Ref: 57
Section Number: 2.7
Bloom's Taxonomy: Understanding

11) New oceanic lithosphere is generated at mid-ocean ridges.
Answer: TRUE
Diff: 1 Page Ref: 46
Section Number: 2.3
Bloom's Taxonomy: Remembering

12) Transform boundaries do not generate earthquakes.
Answer: FALSE
Diff: 1 Page Ref: 48
Section Number: 2.3
Bloom's Taxonomy: Remembering

13) Deep (>200 km) earthquakes can only be found at a convergent boundary.
Answer: TRUE
Diff: 1 Page Ref: 48
Section Number: 2.3
Bloom's Taxonomy: Understanding

14) Only a few transform boundaries (<10) mark the Earth's tectonic plates.
Answer: FALSE
Diff: 1 Page Ref: 48
Section Number: 2.3
Bloom's Taxonomy: Understanding

2.3 Short Answer Questions

1) The rocks of the core consist mostly of _____.
Answer: iron
Diff: 1 Page Ref: 32
Section Number: 2.1
Bloom's Taxonomy: Remembering

2) The _____ separates the mantle and the crust.
Answer: Moho
Diff: 2 Page Ref: 34
Section Number: 2.1
Bloom's Taxonomy: Remembering

3) A change in the direction of wave travel at the core-mantle boundary is called _____.
Answer: refraction
Diff: 2 Page Ref: 35
Section Number: 2.2
Bloom's Taxonomy: Understanding

4) _____-waves pass through the outer core.
Answer: P
Diff: 2 Page Ref: 37
Section Number: 2.2
Bloom's Taxonomy: Understanding

5) Convergence of plates can cause _____ forces that build mountain ranges.
Answer: compressive
Diff: 2 Page Ref: 41
Section Number: 2.3
Bloom's Taxonomy: Remembering

6) _____ can cause uplift in a mountain range through isostatic compensation.
Answer: erosion
Diff: 3 Page Ref: 42
Section Number: 2.3
Bloom's Taxonomy: Applying

7) A(n) _____ is a location where three plates border one another.
Answer: triple junction
Diff: 2 Page Ref: 44
Section Number: 2.3
Bloom's Taxonomy: Remembering

8) At the Curie point, iron-bearing minerals orient themselves parallel to the _____.
Answer: magnetic field
Diff: 2 Page Ref: 47
Section Number: 2.4
Bloom's Taxonomy: Understanding

9) The volcano called _____ is the youngest of the Hawaiian volcanoes.
Answer: Loihi
Diff: 2 Page Ref: 50
Section Number: 2.4
Bloom's Taxonomy: Remembering

10) The supercontinent Pangaea consisted of Laurasia and _____.
Answer: Gondwana
Diff: 2 Page Ref: 52
Section Number: 2.5
Bloom's Taxonomy: Remembering

11) Yellowstone National Park lies atop a(n) _____.
Answer: continental hot spot
Diff: 2 Page Ref: 55
Section Number: 2.4
Bloom's Taxonomy: Understanding

12) The Cascade Mountains are part of a(n) _____ convergent boundary.
Answer: ocean-continent
Diff: 2 Page Ref: 55
Section Number: 2.3
Bloom's Taxonomy: Understanding

13) The San Andreas Fault is a(n) _____ boundary.
Answer: transform
Diff: 2 Page Ref: 55
Section Number: 2.3
Bloom's Taxonomy: Remembering