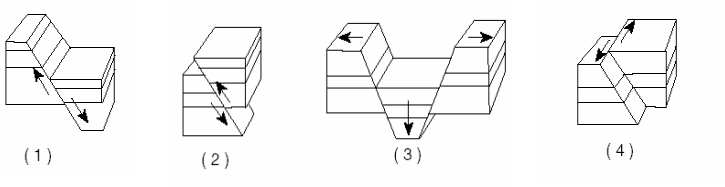
Dynamic Crust Review

1. The basaltic bedrock of the oceanic crust is classified as
   (1) felsic, with a density of 2.7 g/cm^3
   (2) mafic, with a density of 2.7 g/cm^3
   (3) felsic, with a density of 3.0 g/cm^3
   (4) mafic, with a density of 3.0 g/cm^3

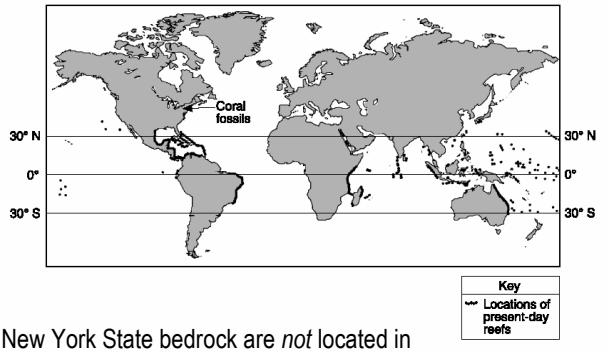
2. At which plate boundary is one lithospheric plate sliding under another?
   (1) Nazca Plate and Antarctic Plate
   (2) Pacific Plate and Indian-Australian Plate
   (3) Indian-Australian Plate and Antarctic Plate
   (4) Nazca Plate and Pacific Plate

3. Which block diagram best shows a transform fault?



4. Alternating parallel bands of normal and reversed magnetic polarity are found in the basaltic bedrock on either side of the
   (1) Mid-Atlantic Ridge
   (2) Yellowstone Hot Spot
   (3) San Andreas Fault
   (4) Peru-Chile Trench

5. On the map , the darkened areas represent locations where living corals currently exist. The arrow points to a location where coral fossils have been found in Devonian-age bedrock in New York State.



   Devonian-age coral fossils found in some New York State bedrock are *not* located in the same general region that present-day corals are living because during the Devonian Period
   (1) corals migrated to New York State
   (2) corals lived everywhere on Earth
   (3) New York State was closer to the equator
   (4) New York State had a colder climate

6 According to the *Earth Science Reference Tables*, which of the following locations is the site of a convergent plate boundary?
   (1) the mid-Atlantic ridge
   (2) the Aleutian trench
   (3) the Atlantic-Indian ridge
   (4) the Pacific/North American plate boundary

7. The edges of most lithospheric plates are characterized by
   (1) reversed magnetic orientation
   (2) frequent earthquake and volcanic activity
   (3) unusually rapid radioactive decay
   (4) low *P*-wave and high *S*-wave velocity

8. Which temperature is inferred to exist in Earth's plastic mantle?
   (1) 2000°C
   (2) 3000°C
   (3) 5000°C
   (4) 6000°C

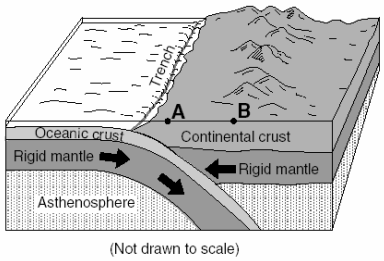
9. Convection currents in the plastic mantle are believed to cause divergence of lithospheric plates at the
   (1) Peru-Chile Trench
   (2) Mariana Trench
   (3) Canary Islands Hot Spot
   (4) Iceland Hot Spot

10. Why does the oceanic crust sink beneath the continental crust at a subduction boundary?
    (1) The oceanic crust has a greater density.
    (2) The oceanic crust is pulled downward by Earth's magnetic field.
    (3) The continental crust has a more mafic composition.
    (4) The continental crust is pulled upward by the Moon's gravity.

11. The movement of tectonic plates is inferred by many scientists to be driven by
    (1) tidal motions in the hydrosphere
    (2) density differences in the troposphere
    (3) convection currents in the asthenosphere
    (4) solidification in the lithosphere

12. The block diagram below shows a tectonic plate boundary. Points *A* and *B* represent locations on Earth's surface.

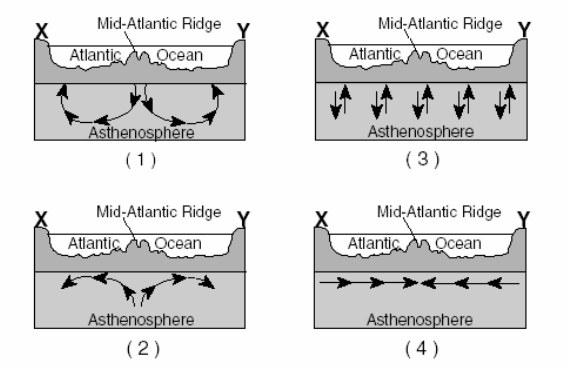
    The diagram represents
    (1) subduction at a divergent plate boundary
    (2) subduction at a convergent plate boundary
    (3) rifting at a convergent plate boundary
    (4) rifting at a transform plate boundary

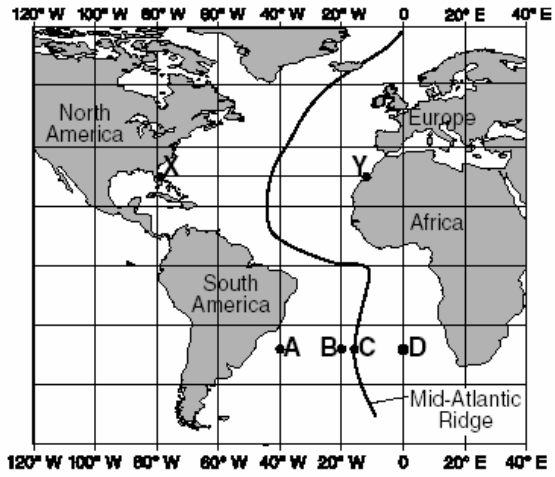


(Not drawn to scale)

Base your answers to questions 13 through 15 on the map of the Mid-Atlantic Ridge shown below.
Points *A* through *D* are locations on the ocean floor. Line *XY* connects locations in North America and Africa.

13. In which cross section do the arrows best show the convection occurring within the asthenosphere beneath line *XY*?





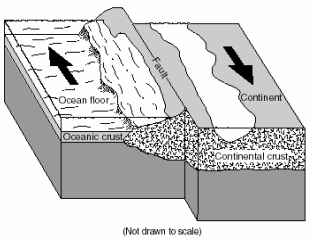
14. Samples of ocean-floor bedrock were collected at points *A*, *B*, *C*, and *D*.
    Which sequence shows the correct order of the age of the bedrock from oldest to youngest?
    (1) *D* → *C* → *B* → *A*
    (2) *A* → *D* → *B* → *C*
    (3) *C* → *B* → *D* → *A*
    (4) *A* → *B* → *D* → *C*

15. The boundary between which two tectonic plates is most similar geologically to the plate boundary at the Mid-Atlantic Ridge?
    (1) Eurasian and Indian-Australian
    (2) Cocos and Caribbean
    (3) Pacific and Nazca
    (4) Nazca and South American

16. What is the inferred temperature at the boundary between Earth's stiffer mantle and outer core?
    (1) 2,500°C
    (2) 4,500°C
    (3) 5,000°C
    (4) 6,200°C

17. Which statement correctly describes the density of Earth's mantle compared to the density of Earth's core and crust?
(1) The mantle is less dense than the core but more dense than the crust.
(2) The mantle is less dense than both the core and the crust.
(3) The mantle is more dense than the core but less dense than the crust.
(4) The mantle is more dense than both the core and the crust.

18. Arrows in the block diagram below show the relative movement along a tectonic plate boundary.



Between which two tectonic plates does this type of plate boundary exist?
(1) Nazca Plate and South American Plate
(2) Eurasian Plate and Indian-Australian Plate
(3) North American Plate and Eurasian Plate
(4) Pacific Plate and North American Plate

19. According to tectonic plate maps, New York State is presently located
(1) at a convergent plate boundary
(2) above a mantle hot spot
(3) above a mid-ocean ridge
(4) near the center of a large plate

20. Rock strata containing fossils of shark's teeth are found at an elevation of 5,000 meters. Which process most likely caused the shark's teeth to be located at this elevation?
(1) crustal subsidence
(2) ocean floor spreading
(3) crustal uplift
(4) continental glaciation

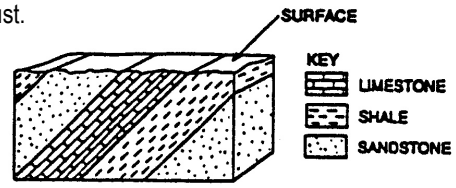
21. How does the oceanic crust compare to the continental crust?
(1) The oceanic crust is thinner and contains less basalt.
(2) The oceanic crust is thinner and contains more basalt.
(3) The oceanic crust is thicker and contains less basalt.
(4) The oceanic crust is thicker and contains more basalt.

22. Which is the best evidence supporting the concept of ocean floor spreading?
(1) Earthquakes occur at greater depths beneath continents than beneath oceans.
(2) Sandstones and limestones can be found both in North America and Europe.
(3) Volcanoes appear at random within the oceanic crust.
(4) Igneous rocks along the mid-ocean ridges are younger than those farther from the ridges.

23. Scientists have inferred the structure of Earth's interior mainly by analyzing
(1) the Moon's interior
(2) the Moon's composition
(3) Earth's surface features
(4) Earth's seismic data

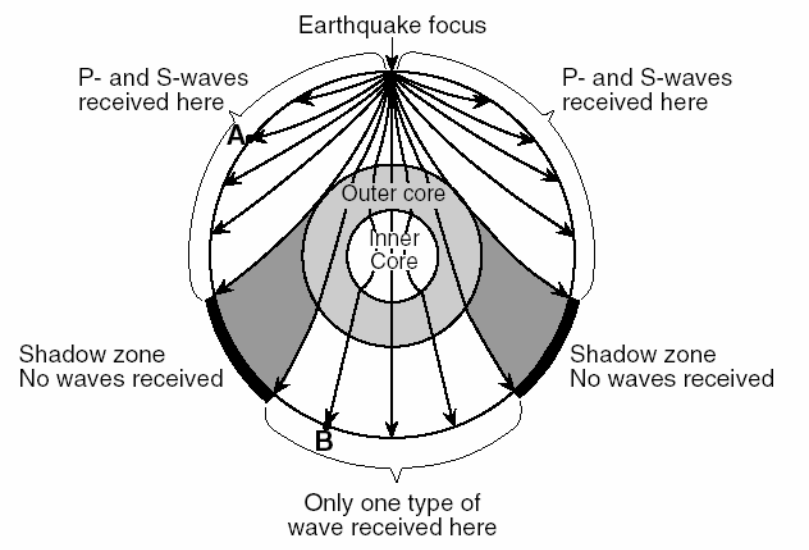
24. What happens to the density and temperature of rock within Earth's interior as depth increases?
(1) density decreases and temperature decreases
(2) density decreases and temperature increases
(3) density increases and temperature increases
(4) density increases and temperature decreases

25. The diagram to the right represents a cross section of a portion of the Earth's crust.



What do these titled rock layers suggest?
(1) This area has remained fairly stable since the sediments were deposited.
(2) The sediments were deposited at steep angles and then became rock.
(3) Metamorphism followed the deposition of the sediments.
(4) Crustal movement occurred sometime after the rocks were deposited.

Base your answers to questions 26 and 27 on the cross-sectional view of Earth below, which shows seismic waves traveling from the focus of an earthquake. Points *A* and *B* are locations on Earth's surface.

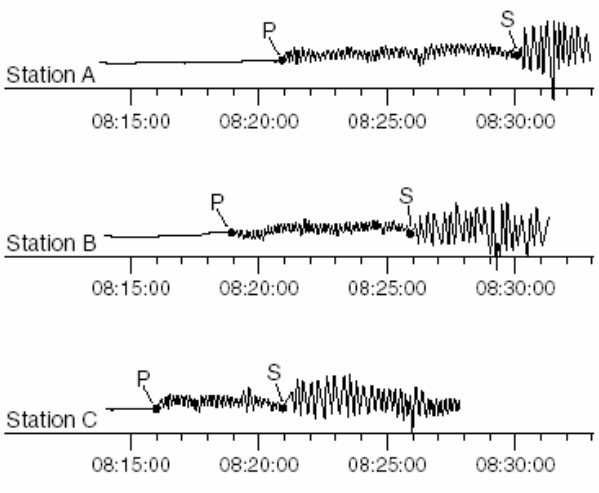


26. Which statement best explains why only one type of seismic wave was recorded at location *B*?
    (1) *S*-waves cannot travel through the liquid outer core.
    (2) *S*-waves cannot travel through the liquid inner core.
    (3) *P*-waves cannot travel through the solid outer core.
    (4) *P*-waves cannot travel through the solid inner core.

27. A seismic station located at point *A* is 5400 kilometers away from the epicenter of the earthquake. If the arrival time for the *P*-wave at point *A* was 2:00 p.m., the arrival time for the *S*-wave at point *A* was approximately
    (1) 1:53 p.m.
    (2) 2:07 p.m.
    (3) 2:09 p.m.
    (4) 2:16 p.m.

28. How long would it take for the first *S*-wave to arrive at a seismic station 4,000 kilometers away from the epicenter of an earthquake?
    (1) 5 min 40 sec
    (2) 7 min 0 sec
    (3) 12 min 40 sec
    (4) 13 min 20 sec

Questions 29-30: The diagram below represents three seismograms showing the same earthquake as it was recorded at three different seismic stations, *A, B,* and *C*.



29. Which statement correctly describes the distance between the earthquake epicenter and these seismic stations?
    (1) *A* is closest to the epicenter, and *C* is farthest from the epicenter.
    (2) *B* is closest to the epicenter, and *C* is farthest from the epicenter.
    (3) *C* is closest to the epicenter, and *A* is farthest from the epicenter.
    (4) *A* is closest to the epicenter, and *B* is farthest from the epicenter.

30. What is the distance to the epicenter from station C?
    (1) 1300 km
    (2) 2600 km
    (3) 3400 km
    (4) 4000 km