

Student: \_\_\_\_\_

1. Stress tending to pull objects apart is \_\_\_\_\_ stress.
  - A. Compressive
  - B. Tensile
  - C. Shearing
  - D. Elastic
2. A ductile material is one that
  - A. Resists deformation under stress.
  - B. Conducts electricity well.
  - C. Readily undergoes plastic deformation.
  - D. Ruptures easily under stress.
3. The strength of a rock
  - A. May depend on how long it has been subjected to stress.
  - B. Varies with the kind of stress (compressive, tensile or shearing).
  - C. May be reduced by weathering or fracturing.
  - D. All of the choices are correct.
4. For most solids, sufficiently increased stress results in
  - A. Breakage.
  - B. Rupture.
  - C. Deformation.
  - D. Transformation.
5. According to plate-tectonic theory, plates of rigid, elastic \_\_\_\_\_ move over a weak plastic layer below.
  - A. Lithosphere
  - B. Asthenosphere
  - C. Mantle
  - D. Core
6. Oceanic lithosphere
  - A. Is made of alternating bands of rocks of different compositions.
  - B. Is made of alternating bands of rocks of two different ages.
  - C. Records magnetic "stripes" of normally and reversely magnetized rocks.
  - D. Moves gradually toward the midocean ridges, where it is consumed.
7. The magnetic dip preserved in a rock indicates
  - A. How far east or west of north the rock crystallized.
  - B. The rock's magnetic latitude at the time that it - crystallized.
  - C. How deep in the crust the magma crystallized.
  - D. How far from a spreading ridge the rock has traveled.
8. A rock's Curie temperature is the temperature above which it
  - A. Melts.
  - B. Begins to flow plastically.
  - C. Loses its magnetism.
  - D. Ruptures.

9. Fossil remains of this animal proved important to the belief that South America and Africa were once joined, then drifted apart
  - A. Glossopteris.
  - B. Ichtyosaur.
  - C. Crinoids.
  - D. Mesosaur.
  
10. With increasing distance from an oceanic ridge,
  - A. The rocks become older.
  - B. The rocks become younger.
  - C. The rocks' ages alternate between younger and older.
  - D. All of the choices; different patterns occur at different ridges.
  
11. A "polar-wander" curve shows
  - A. How magnetic poles have moved on the earth.
  - B. How the sea floor has spread.
  - C. How continents have moved or drifted, relative to the magnetic poles.
  - D. How polar glacier ice has moved across continents.
  
12. Pre-drift reassembly of the continents can be assisted by
  - A. Polar-wander curves.
  - B. Matching up the shapes of the corresponding continental margins.
  - C. Matching up mountain ranges and rock types between once-adjacent continents.
  - D. All of the choices are correct.
  
13. The Azores Islands
  - A. Are remnants of rare rift zone volcanoes.
  - B. Are part of the Aleutian Island volcanic arc.
  - C. Are, like Hawaii, formed by a Hot Spot.
  - D. Are not formed by tectonic processes.
  
14. Divergent plate boundaries
  - A. Always result in rifts along which new oceanic crust is created.
  - B. May result in rifts on continents, but may also "fail" or stop, resulting in topographically low areas.
  - C. Are no longer a potential hazard if they are not actively rifting.
  - D. Are simple curvilinear features on all ocean floors.
  
15. Divergent plate boundaries around the world are indicated by
  - A. Seafloor spreading.
  - B. Hotspots.
  - C. Subduction zones.
  - D. Both seafloor spreading and subduction zones.
  
16. Example of the movement of the following plates: continent-ocean; continent-continent; ocean-ocean is best referred to as the
  - A. Divergent plate boundary.
  - B. Transform plate boundary.
  - C. Constructive plate boundary.
  - D. Convergent plate boundary.
  
17. At a convergent plate boundary,
  - A. Sea floor is produced.
  - B. High mountains may be built during continent-continent collision.
  - C. There are very few earthquakes.
  - D. All of the choices are correct.

18. Sea floor is formed at spreading ridges and destroyed
  - A. At divergent boundaries.
  - B. In transform faults.
  - C. In subduction zones.
  - D. By magnetic-field reversals.
19. The San Andreas fault is a good example of a
  - A. Convergent plate boundary.
  - B. Divergent plate boundary.
  - C. Transform plate boundary.
  - D. Hotspot.
20. These are areas not connected with plate boundaries but are regions of volcanic activities and are use to monitor the direction and movement of plates are called
  - A. Divergent plate boundaries.
  - B. Volcanic areas.
  - C. Convergent plate boundaries.
  - D. Hotspots.
21. Hot spots
  - A. Move along with plates.
  - B. Can exist under both oceans and continents, but remain stationary as the plate above moves.
  - C. result in extrusion of volcanic rocks.
  - D. Both b and c are correct.
22. The locations and ages of islands in the Hawaiian Island chain can be used to show
  - A. The direction of drift of North America.
  - B. The rate and direction of movement of the Pacific Plate.
  - C. The size of earthquakes to be expected in the Pacific Ocean.
  - D. All of the choices are correct.
23. Plates move away from each other by 3.5 cm per year at the mid-Atlantic ridge, for a net growth of 7 cm per year for the width of the Atlantic Ocean. How much wider is the Atlantic Ocean today compared to when Columbus discovered the Americas in 1492?
  - A. About 40 meters
  - B. About 400 meters
  - C. About 4 meters
  - D. About 4 kilometers (4000 meters)
24. A possible "driving force" for plate motions is
  - A. Volcanic eruption at hot spots.
  - B. Shifts in the earth's magnetic field.
  - C. Convection in the asthenosphere.
  - D. The weight of subducted continents pulling downward.
25. The Appalachian Mountains of eastern North America were formed by continent-continent collision. Today, these mountains are still being uplifted by the same type of collision
  - A. The Andes Mountains of South America.
  - B. The Cascade Mountains of North America.
  - C. The Rocky Mountains of North America.
  - D. The Himalaya Mountains of Asia.
26. Stress is the deformation resulting from the application of strain to a rock.  
True False
27. Rubber bands show elastic behavior until their elastic limit is exceeded; rocks are always brittle.  
True False

28. Deep in the crust, at elevated temperatures, rocks may behave plastically and undergo folding or flow.  
True False
29. Rocks may behave differently over the long spans of geologic time than they do in short-term laboratory experiments.  
True False
30. The physical properties of a rock are determined only by grain shapes and sizes and are independent of the kinds of minerals making up the rock.  
True False
31. Brittle behavior in rocks leads to formation of folds.  
True False
32. In order for continental drift to occur, the continental lithosphere must behave plastically.  
True False
33. The idea of continental drift was not proposed until the 1960s, when the first evidence to support it was discovered.  
True False
34. The asthenosphere is a weak, locally partly molten layer over which lithospheric plates can move.  
True False
35. Plate boundaries were originally located by a French graduate student who plotted the location of all earthquakes and volcanic eruptions world-wide on a map.  
True False
36. The remnant magnetism in the rocks is called paleomagnetism.  
True False
37. The earth's polarity has remained the same since its existence.  
True False
38. An island arc comprising of volcanic islands forms as a result of ocean-ocean convergence.  
True False
39. Because the sea floor is protected from weathering, seafloor rocks are better preserved and generally older than continental rocks.  
True False
40. Continental drift may explain evidence of past glaciation in regions now located in the tropics, because local climate is strongly controlled by latitude.  
True False
41. The best explanation for the distribution of Glossopteris and Mesosaurus is that they lived when continents on which their fossils are now found were once connected then later were rifted and drifted apart.  
True False
42. About 200 million years ago, most of the continents were together, forming a "super continent" called Pangaea.  
True False
43. Rifting occurs at oceanic spreading ridges, but not within continents, because continents are so thick and strong.  
True False
44. Seawater interacting with hot sea floor at spreading ridges may produce mineral deposits.  
True False

45. Transform faults that offset segments of a spreading ridge are formed because rates of spreading are not constant along any one rift zone so shearing develops when one segment grows faster than another.  
True False
46. Part of western California is attached to the Pacific Plate, while most of North America belongs to a separate plate.  
True False
47. The Hawaiian Islands were formed by repeated volcanic eruptions over a hot spot.  
True False
48. Earthquakes occur at subduction zones, but volcanoes do not because the subducted lithosphere is pushed deep into the mantle.  
True False
49. Satellite data now allow direct measurement of the rates of plate movement, even though it is slow.  
True False
50. It is not possible to estimate rates of plate movement because new rocks are constantly being created from old.  
True False
51. Although convection in the asthenosphere is widely accepted as the cause of plate movements, it may be that the weight of down-going lithosphere in subduction zones pulls the trailing plate behind it.  
True False
52. Plate tectonics are unrelated to the rock cycle and, in fact, has made the rock-cycle concept obsolete.  
True False

### 3 Key

1. Stress tending to pull objects apart is \_\_\_\_\_ stress.
- A. Compressive
  - B. Tensile**
  - C. Shearing
  - D. Elastic

*Montgomery - Chapter 03 #1*

2. A ductile material is one that
- A. Resists deformation under stress.
  - B. Conducts electricity well.
  - C. Readily undergoes plastic deformation.**
  - D. Ruptures easily under stress.

*Montgomery - Chapter 03 #2*

3. The strength of a rock
- A. May depend on how long it has been subjected to stress.
  - B. Varies with the kind of stress (compressive, tensile or shearing).
  - C. May be reduced by weathering or fracturing.
  - D. All of the choices are correct.**

*Montgomery - Chapter 03 #3*

4. For most solids, sufficiently increased stress results in
- A. Breakage.
  - B. Rupture.**
  - C. Deformation.
  - D. Transformation.

*Montgomery - Chapter 03 #4*

5. According to plate-tectonic theory, plates of rigid, elastic \_\_\_\_\_ move over a weak plastic layer below.
- A. Lithosphere**
  - B. Asthenosphere
  - C. Mantle
  - D. Core

*Montgomery - Chapter 03 #5*

6. Oceanic lithosphere
- A. Is made of alternating bands of rocks of different compositions.
  - B. Is made of alternating bands of rocks of two different ages.
  - C. Records magnetic "stripes" of normally and reversely magnetized rocks.**
  - D. Moves gradually toward the midocean ridges, where it is consumed.

*Montgomery - Chapter 03 #6*

7. The magnetic dip preserved in a rock indicates
- A. How far east or west of north the rock crystallized.
  - B. The rock's magnetic latitude at the time that it - crystallized.**
  - C. How deep in the crust the magma crystallized.
  - D. How far from a spreading ridge the rock has traveled.

*Montgomery - Chapter 03 #7*

8. A rock's Curie temperature is the temperature above which it
- A. Melts.
  - B. Begins to flow plastically.
  - C. Loses its magnetism.**
  - D. Ruptures.

*Montgomery - Chapter 03 #8*

9. Fossil remains of this animal proved important to the belief that South America and Africa were once joined, then drifted apart
- A. Glossopteris.
  - B. Ichtyosaur.
  - C. Crinoids.
  - D. Mesosaur.**

*Montgomery - Chapter 03 #9*

10. With increasing distance from an oceanic ridge,
- A.** The rocks become older.
  - B. The rocks become younger.
  - C. The rocks' ages alternate between younger and older.
  - D. All of the choices; different patterns occur at different ridges.

*Montgomery - Chapter 03 #10*

11. A "polar-wander" curve shows
- A. How magnetic poles have moved on the earth.
  - B. How the sea floor has spread.
  - C.** How continents have moved or drifted, relative to the magnetic poles.
  - D. How polar glacier ice has moved across continents.

*Montgomery - Chapter 03 #11*

12. Pre-drift reassembly of the continents can be assisted by
- A. Polar-wander curves.
  - B. Matching up the shapes of the corresponding continental margins.
  - C. Matching up mountain ranges and rock types between once-adjacent continents.
  - D.** All of the choices are correct.

*Montgomery - Chapter 03 #12*

13. The Azores Islands
- A.** Are remnants of rare rift zone volcanoes.
  - B. Are part of the Aleutian Island volcanic arc.
  - C. Are, like Hawaii, formed by a Hot Spot.
  - D. Are not formed by tectonic processes.

*Montgomery - Chapter 03 #13*

14. Divergent plate boundaries
- A. Always result in rifts along which new oceanic crust is created.
  - B.** May result in rifts on continents, but may also "fail" or stop, resulting in topographically low areas.
  - C. Are no longer a potential hazard if they are not actively rifting.
  - D. Are simple curvilinear features on all ocean floors.

*Montgomery - Chapter 03 #14*

15. Divergent plate boundaries around the world are indicated by
- A. Seafloor spreading.
  - B. Hotspots.
  - C. Subduction zones.
  - D.** Both seafloor spreading and subduction zones.

*Montgomery - Chapter 03 #15*

16. Example of the movement of the following plates: continent-ocean; continent-continent; ocean-ocean is best referred to as the
- A. Divergent plate boundary.
  - B. Transform plate boundary.
  - C. Constructive plate boundary.
  - D.** Convergent plate boundary.

*Montgomery - Chapter 03 #16*

17. At a convergent plate boundary,  
A. Sea floor is produced.  
**B.** High mountains may be built during continent-continent collision.  
C. There are very few earthquakes.  
D. All of the choices are correct.

*Montgomery - Chapter 03 #17*

18. Sea floor is formed at spreading ridges and destroyed  
A. At divergent boundaries.  
B. In transform faults.  
**C.** In subduction zones.  
D. By magnetic-field reversals.

*Montgomery - Chapter 03 #18*

19. The San Andreas fault is a good example of a  
A. Convergent plate boundary.  
B. Divergent plate boundary.  
**C.** Transform plate boundary.  
D. Hotspot.

*Montgomery - Chapter 03 #19*

20. These are areas not connected with plate boundaries but are regions of volcanic activities and are used to monitor the direction and movement of plates are called  
A. Divergent plate boundaries.  
B. Volcanic areas.  
C. Convergent plate boundaries.  
**D.** Hotspots.

*Montgomery - Chapter 03 #20*

21. Hot spots  
A. Move along with plates.  
B. Can exist under both oceans and continents, but remain stationary as the plate above moves.  
C. result in extrusion of volcanic rocks.  
**D.** Both b and c are correct.

*Montgomery - Chapter 03 #21*

22. The locations and ages of islands in the Hawaiian Island chain can be used to show  
A. The direction of drift of North America.  
**B.** The rate and direction of movement of the Pacific Plate.  
C. The size of earthquakes to be expected in the Pacific Ocean.  
D. All of the choices are correct.

*Montgomery - Chapter 03 #22*

23. Plates move away from each other by 3.5 cm per year at the mid-Atlantic ridge, for a net growth of 7 cm per year for the width of the Atlantic Ocean. How much wider is the Atlantic Ocean today compared to when Columbus discovered the Americas in 1492?  
**A.** About 40 meters  
B. About 400 meters  
C. About 4 meters  
D. About 4 kilometers (4000 meters)

*Montgomery - Chapter 03 #23*

24. A possible "driving force" for plate motions is  
A. Volcanic eruption at hot spots.  
B. Shifts in the earth's magnetic field.  
**C.** Convection in the asthenosphere.  
D. The weight of subducted continents pulling downward.

*Montgomery - Chapter 03 #24*

25. The Appalachian Mountains of eastern North America were formed by continent-continent collision. Today, these mountains are still being uplifted by the same type of collision
- A. The Andes Mountains of South America.
  - B. The Cascade Mountains of North America.
  - C. The Rocky Mountains of North America.
  - D.** The Himalaya Mountains of Asia.

*Montgomery - Chapter 03 #25*

26. Stress is the deformation resulting from the application of strain to a rock.  
**FALSE**

*Montgomery - Chapter 03 #26*

27. Rubber bands show elastic behavior until their elastic limit is exceeded; rocks are always brittle.  
**FALSE**

*Montgomery - Chapter 03 #27*

28. Deep in the crust, at elevated temperatures, rocks may behave plastically and undergo folding or flow.  
**TRUE**

*Montgomery - Chapter 03 #28*

29. Rocks may behave differently over the long spans of geologic time than they do in short-term laboratory experiments.  
**TRUE**

*Montgomery - Chapter 03 #29*

30. The physical properties of a rock are determined only by grain shapes and sizes and are independent of the kinds of minerals making up the rock.  
**FALSE**

*Montgomery - Chapter 03 #30*

31. Brittle behavior in rocks leads to formation of folds.  
**FALSE**

*Montgomery - Chapter 03 #31*

32. In order for continental drift to occur, the continental lithosphere must behave plastically.  
**FALSE**

*Montgomery - Chapter 03 #32*

33. The idea of continental drift was not proposed until the 1960s, when the first evidence to support it was discovered.  
**FALSE**

*Montgomery - Chapter 03 #33*

34. The asthenosphere is a weak, locally partly molten layer over which lithospheric plates can move.  
**TRUE**

*Montgomery - Chapter 03 #34*

35. Plate boundaries were originally located by a French graduate student who plotted the location of all earthquakes and volcanic eruptions world-wide on a map.  
**TRUE**

*Montgomery - Chapter 03 #35*

36. The remnant magnetism in the rocks is called paleomagnetism.  
**TRUE**

*Montgomery - Chapter 03 #36*

37. The earth's polarity has remained the same since its existence.  
**FALSE**

*Montgomery - Chapter 03 #37*

38. An island arc comprising of volcanic islands forms as a result of ocean-ocean convergence.  
**TRUE**

*Montgomery - Chapter 03 #38*

39. Because the sea floor is protected from weathering, seafloor rocks are better preserved and generally older than continental rocks.  
**FALSE**
40. Continental drift may explain evidence of past glaciation in regions now located in the tropics, because local climate is strongly controlled by latitude.  
*Montgomery - Chapter 03 #39*  
**TRUE**
41. The best explanation for the distribution of *Glossopteris* and *Mesosaurus* is that they lived when continents on which their fossils are now found were once connected then later were rifted and drifted apart.  
*Montgomery - Chapter 03 #40*  
**TRUE**
42. About 200 million years ago, most of the continents were together, forming a "super continent" called Pangaea.  
*Montgomery - Chapter 03 #41*  
**TRUE**
43. Rifting occurs at oceanic spreading ridges, but not within continents, because continents are so thick and strong.  
*Montgomery - Chapter 03 #42*  
**FALSE**
44. Seawater interacting with hot sea floor at spreading ridges may produce mineral deposits.  
*Montgomery - Chapter 03 #43*  
**TRUE**
45. Transform faults that offset segments of a spreading ridge are formed because rates of spreading are not constant along any one rift zone so shearing develops when one segment grows faster than another.  
*Montgomery - Chapter 03 #44*  
**TRUE**
46. Part of western California is attached to the Pacific Plate, while most of North America belongs to a separate plate.  
*Montgomery - Chapter 03 #45*  
**TRUE**
47. The Hawaiian Islands were formed by repeated volcanic eruptions over a hot spot.  
*Montgomery - Chapter 03 #46*  
**TRUE**
48. Earthquakes occur at subduction zones, but volcanoes do not because the subducted lithosphere is pushed deep into the mantle.  
*Montgomery - Chapter 03 #47*  
**FALSE**
49. Satellite data now allow direct measurement of the rates of plate movement, even though it is slow.  
*Montgomery - Chapter 03 #48*  
**TRUE**
50. It is not possible to estimate rates of plate movement because new rocks are constantly being created from old.  
*Montgomery - Chapter 03 #49*  
**FALSE**
51. Although convection in the asthenosphere is widely accepted as the cause of plate movements, it may be that the weight of down-going lithosphere in subduction zones pulls the trailing plate behind it.  
*Montgomery - Chapter 03 #50*  
**TRUE**

52. Plate tectonics are unrelated to the rock cycle and, in fact, has made the rock-cycle concept obsolete.

**FALSE**

## 3 Summary

<u>Category</u>	<u># of Questions</u>
Montgomery - Chapter 03	52