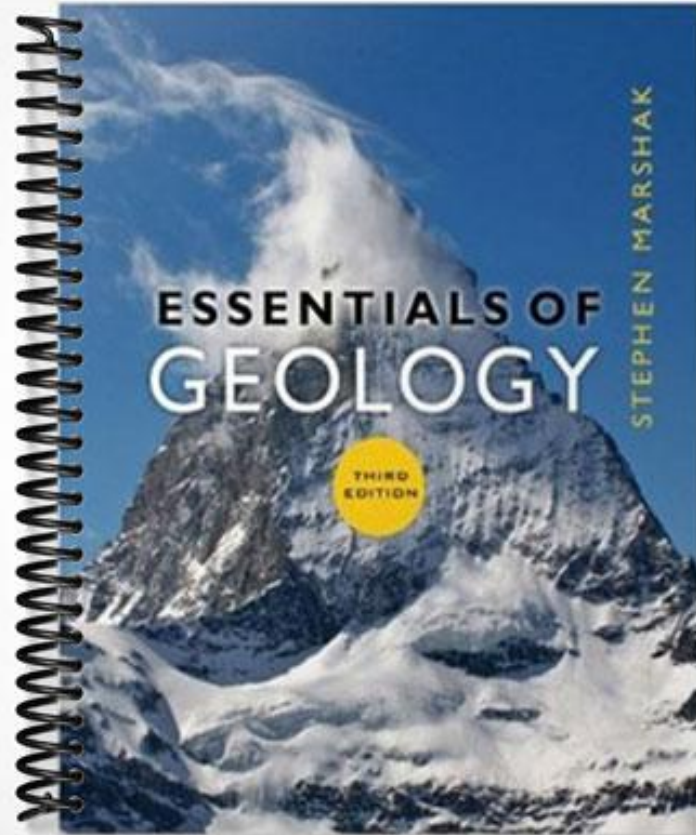


**TEST BANK**



## CHAPTER 2 The Way the Earth Works: Plate Tectonics

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### MULTIPLE CHOICE

1. Wegener proposed continental drift after he observed evidence from fossils, glacial deposits, and the fit of the continents that suggested all of the continents were once \_\_\_\_\_.
  - a. aligned north to south along the prime meridian during the late Cenozoic
  - b. aligned east to west along the equator during the late Mesozoic through the Cenozoic
  - c. combined to form a supercontinent (he termed Rodinia) in the Proterozoic
  - d. combined to form a supercontinent (he termed Pangaea) in the late Paleozoic through the Mesozoic

ANS: D

2. Late Paleozoic glacial deposits are NOT found in which of the following places?
  - a. India
  - b. southern Africa
  - c. North America
  - d. South America

ANS: C

3. Abundant swamps led to the formation of coal during the Late Paleozoic in which of the following places?
  - a. India
  - b. southern Africa
  - c. North America
  - d. Antarctica

ANS: C

4. Which plant genus dominated glaciated regions during the late Paleozoic and early Mesozoic?
  - a. *Ginkgo*
  - b. *Glossopteris*
  - c. *Neuropteris*
  - d. *Quercas*

ANS: B

5. Wegener's idea of continental drift was rejected by American geologists because \_\_\_\_\_.
  - a. his English was too poor to be understood by them
  - b. he could not conceive of a valid mechanism that would cause continents to shift positions
  - c. he had relatively little evidence supporting the existence of a supercontinent
  - d. the apparent fit of continental coastlines is blurred when the margins are defined by the edges of continental shelves rather than at sea level

ANS: B

6. Currently, most geologists \_\_\_\_\_.
- continue to reject continental drift
  - agree that continental drift occurs, but they still do not understand why it occurs
  - agree that continental drift occurs; the mechanisms that drive drift are at work in the ocean basins and upper mantle and were unknown in Wegener's time
  - agree that continental drift occurs; the mechanisms that drive drift are at work in the lower mantle and outer core and were unknown in Wegener's time

ANS: C

7. The magnetic field of Earth in the geologic past is \_\_\_\_\_.
- unknown, but it is assumed to have been identical to today's
  - known to have been constant through geologic time, due to remnant magnetization of iron-rich minerals in rocks
  - known to have experienced numerous polarity reversals, due to remnant magnetization of iron-rich minerals in rocks
  - known to have been constant through time, on the basis of theoretical calculations

ANS: A

8. The apparent tendency of the north (or south) magnetic pole to vary in position over time is termed \_\_\_\_\_.
- dipole
  - magnetic declination
  - magnetic inclination
  - polar wander

ANS: D

9. The apparent polar-wander paths for continents that were not connected over some span of geologic history will likely \_\_\_\_\_ concerning the positions of the ancient magnetic pole.
- agree
  - disagree

ANS: B

10. Sea-floor spreading is driven by volcanic activity \_\_\_\_\_.
- in the middle of abyssal plains
  - along mid-ocean ridges
  - at the edges of continental shelves
  - along fracture zones

ANS: B

11. Within the sea floor, the rate of heat flow is greatest \_\_\_\_\_.
- along mid-ocean ridges
  - along fracture zones
  - at the edges of ocean basins
  - in the center of abyssal plains

ANS: A

12. Regions of the sea floor with positive magnetic anomalies were formed during times when Earth's magnetic field \_\_\_\_\_.
- a. was exceptionally strong
  - b. was exceptionally weak
  - c. had normal polarity
  - d. had reversed polarity

ANS: C

13. Regions of the sea floor with negative magnetic anomalies were formed during times when Earth's magnetic field \_\_\_\_\_.
- a. was exceptionally strong
  - b. was exceptionally weak
  - c. had normal polarity
  - d. had reversed polarity

ANS: D

14. Marine magnetic anomaly belts run parallel to \_\_\_\_\_.
- a. mid-ocean ridges
  - b. fracture zones
  - c. continental coastlines
  - d. continental shelves

ANS: A

15. Marine magnetic anomaly belts are widest when and where \_\_\_\_\_.
- a. continents are joined to form supercontinents
  - b. sea-floor spreading rates are relatively rapid
  - c. sea-floor spreading rates are relatively slow

ANS: B

16. The age of oceanic crust \_\_\_\_\_ with increasing distance from a mid-ocean ridge.
- a. increases
  - b. decreases

ANS: A

17. Wegener's evidence for a united Pangaea was so compelling that virtually all geologists agreed with the idea of continental drift during his lifetime.
- a. true
  - b. false

ANS: B

18. Distinctive rock sequences on South America terminate at the Atlantic Ocean but reappear on the continent of \_\_\_\_\_.
- a. Africa
  - b. Europe
  - c. North America
  - d. Australia

ANS: A

19. If we mentally align the continents to fit Wegener's concept of Pangaea, evidence of late Paleozoic glacial deposits \_\_\_\_\_.
- is more difficult to explain than in the modern continental configuration
  - is much more readily explained than in the modern continental configuration
  - makes very little sense in either the Pangaea configuration or the modern configuration

ANS: B

20. The apparent polar-wander path obtained from magnetite crystals in basalts on the North American continent is now interpreted to be the result of \_\_\_\_\_.
- wandering of the geomagnetic north pole
  - drifting of the North American continent

ANS: B

21. The deep ocean floor is flat and nearly featureless.
- true
  - false

ANS: B

22. Beneath a blanket of sediments, oceanic crust is primarily composed of two rocks, \_\_\_\_\_.
- granite and diorite
  - gabbro and basalt
  - sandstone and shale
  - slate and gneiss

ANS: B

23. All basalts younger than 700,000 years old \_\_\_\_\_.
- have normal magnetic polarity
  - have reverse magnetic polarity
  - are found on the ocean floor very far from mid-ocean ridges
  - are found on the continents

ANS: A

24. Marine magnetic anomalies result from sea-floor spreading in conjunction with \_\_\_\_\_.
- global warming
  - magnetic storms on the surface of the Sun
  - magnetic polarity reversals
  - apparent wander of the magnetic poles

ANS: C

25. The oldest sediments on the ocean floor are about \_\_\_\_\_ years old.
- 50 thousand
  - 4 billion

- c. 200 million
- d. 2.5 million

ANS: C

26. The primary difference between lithospheric and asthenospheric mantle that gives rise to numerous divergent patterns of physical behavior, is \_\_\_\_\_.
- a. physical state (the lithosphere is solid, and the asthenosphere is liquid)
  - b. chemical composition (the lithosphere is mafic, and the asthenosphere is felsic)
  - c. temperature (the lithosphere is cooler than the asthenosphere)
  - d. chemical composition (the lithosphere is felsic, and the asthenosphere is mafic)

ANS: C

27. The theory of plate tectonics \_\_\_\_\_.
- a. incorporates continental drift but not sea-floor spreading
  - b. incorporates sea-floor spreading but not continental drift
  - c. incorporates and explains both sea-floor spreading and continental drift
  - d. does not incorporate sea-floor spreading or continental drift

ANS: C

28. Unlike the lithosphere, the asthenosphere \_\_\_\_\_.
- a. is relatively weak and flows readily
  - b. has a density similar to the core
  - c. varies in thickness from place to place
  - d. is relatively cool

ANS: A

29. Continental lithosphere \_\_\_\_\_.
- a. is thicker than oceanic lithosphere
  - b. contains more mafic rocks than oceanic lithosphere
  - c. is denser than oceanic lithosphere
  - d. contains no crustal material, consisting solely of lithified upper mantle

ANS: A

30. The average thickness of continental lithosphere is about \_\_\_\_\_.
- a. 30 km
  - b. 60 km
  - c. 150 km
  - d. 10,000 km

ANS: C

31. The thickness of oceanic lithosphere is \_\_\_\_\_.
- a. uniformly 100 km
  - b. greatest at the geographic poles and least near the equator
  - c. greatest near the mid-ocean ridges and thins out away from the ridges
  - d. least near the mid-ocean ridges and thickens away from the ridges

ANS: D

32. Under the theory of plate tectonics, the plates themselves are \_\_\_\_\_.
- a. discrete pieces of lithosphere at the surface of the solid Earth that move with respect to one another
  - b. discrete layers of lithosphere that are vertically stacked one atop the other
  - c. composed only of continental rocks, which plow through the weaker oceanic rocks
  - d. very thick (approximately one-quarter of Earth's radius)

ANS: A

33. In the terminology of plate tectonics, an active margin is \_\_\_\_\_.
- a. synonymous with "subduction zone"
  - b. a 5-mile radius surrounding an active volcano
  - c. a continental coastline that coincides with a plate boundary
  - d. anywhere on Earth where earthquakes are especially frequent

ANS: C

34. Continental coastlines that occur within the interior of a tectonic plate are called \_\_\_\_\_.
- a. internal margins
  - b. passive margins
  - c. active margins
  - d. inert margins

ANS: B

35. Broad, sediment-covered continental shelves are found along \_\_\_\_\_.
- a. active margins
  - b. passive margins

ANS: B

36. Tectonic plates might consist of \_\_\_\_\_.
- a. continental lithosphere only
  - b. oceanic lithosphere only
  - c. oceanic or continental lithosphere or a combination of both
  - d. either oceanic or continental lithosphere, but not both

ANS: C

37. Deformed (bent, stretched, or cracked) lithosphere occurs \_\_\_\_\_.
- a. randomly over the surface of Earth
  - b. primarily within the interiors of tectonic plates
  - c. primarily on the margins of tectonic plates

ANS: C

38. Every plate boundary can be recognized by \_\_\_\_\_.
- a. the presence of active volcanoes
  - b. the presence of an earthquake belt
  - c. a deep chasm which can be seen from space
  - d. none of the above

ANS: B

39. Tectonic plates move at rates that are approximately \_\_\_\_\_.
- a. 1 to 5 cm every 1,000 years
  - b. 1 to 15 cm/year
  - c. 1 to 15 m/year
  - d. 10 to 100 m/year

ANS: B

40. At a divergent plate boundary, two opposed plates \_\_\_\_\_.
- a. move toward one another
  - b. move away from one another
  - c. slide past one another

ANS: B

41. At a convergent plate boundary, two opposed plates \_\_\_\_\_.
- a. move toward one another
  - b. move away from one another
  - c. slide past one another

ANS: A

42. At a transform plate boundary, two opposed plates \_\_\_\_\_.
- a. move toward one another
  - b. move away from one another
  - c. slide past one another

ANS: C

43. Mid-ocean ridges are \_\_\_\_\_.
- a. convergent plate boundaries
  - b. divergent plate boundaries
  - c. transform plate boundaries

ANS: B

44. As compared to a slowly spreading mid-ocean ridge, a rapidly spreading ridge is \_\_\_\_\_.
- a. wider
  - b. narrower
  - c. more silicic in lava composition

ANS: A

45. All lithospheric plates are approximately the same size and contain a combination of oceanic and continental crust.
- a. true
  - b. false

ANS: B



46. The youngest sea floor occurs \_\_\_\_\_.
- along passive margins
  - along active margins
  - along mid-ocean ridges
  - randomly over the entire ocean basin

ANS: C

47. Oceanic lithosphere thickens away from the mid-ocean ridge primarily due to \_\_\_\_\_.
- the addition of new crust due to hot-spot volcanism
  - the addition of new crust due to sedimentation
  - the addition of new lithospheric mantle as a result of cooling
  - reasons that geologists cannot determine at present

ANS: C

48. Subduction zones are \_\_\_\_\_.
- convergent plate boundaries
  - divergent plate boundaries
  - transform plate boundaries

ANS: A

49. At a subduction zone, the overriding plate \_\_\_\_\_.
- is always composed of continental lithosphere
  - is always composed of oceanic lithosphere
  - may be composed of either oceanic or continental lithosphere

ANS: C

50. At a subduction zone, the downgoing (subducting) plate \_\_\_\_\_.
- is always composed of continental lithosphere
  - is always composed of oceanic lithosphere
  - may be composed of either oceanic or continental lithosphere

ANS: B

51. The Wadati-Benioff zone is a belt of earthquakes found \_\_\_\_\_.
- within an otherwise stable continental interior
  - within an overriding plate at a subduction zone
  - within a downgoing plate at a subduction zone
  - along mid-ocean ridges

ANS: C

52. The Wadati-Benioff zone extends down within the mantle to a maximum depth of \_\_\_\_\_.
- 30 km
  - 150 km
  - 670 km
  - 990 km

ANS: C

53. At transform plate boundaries \_\_\_\_\_.
- earthquakes are common, but volcanoes are absent
  - volcanoes are common, but earthquakes do not occur
  - both earthquakes and volcanoes are common

ANS: A

54. A triple junction is a place on Earth's surface where \_\_\_\_\_.
- three volcanoes form a tight, triangular cluster
  - glacial ice, continental rocks, and the ocean can be found together
  - the boundaries of three lithospheric plates meet at a single point
  - the boundaries of three lithospheric plates meet to form an elongate surface

ANS: C

55. The mid-ocean ridges are elevated above the surrounding sea floor because \_\_\_\_\_.
- ridge rocks are hot and therefore of relatively low density
  - the lithospheric plates are thickest at the ridges so they stand up taller
  - rising ocean currents leave a vacuum above the ridge
  - ridge rocks are mafic, whereas the ocean basin crust consists of ultramafic rock

ANS: A

56. Hawaii is an example of \_\_\_\_\_.
- hot-spot volcanism
  - mid-ocean ridge volcanism
  - a volcanic island arc
  - a transform margin

ANS: A

57. Segments of the mid-ocean ridge system are offset. Between the offset segments we observe \_\_\_\_\_.
- a second series of ridges, perpendicular to the main set
  - deep-ocean trenches
  - transform faults
  - None of the above is correct.

ANS: C

58. When two bodies of continental lithosphere are pushed together at a convergent boundary, the result is \_\_\_\_\_.
- subduction
  - collision and mountain formation

ANS: B

59. Most of the pushing force that drives plate motion is produced \_\_\_\_\_.
- at mid-ocean ridges
  - at subduction zones
  - at collision zones
  - in the interiors of continental plates

ANS: A

60. Most of the pulling force that drives plate motion is produced \_\_\_\_\_.
- a. at mid-ocean ridges
  - b. at subduction zones
  - c. at collision zones
  - d. in the interiors of continental plates

ANS: B