# *Physical Geology Today 1st edition Nance Test Bank*

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1. By the early twentieth century, geologists had numerous observations suggesting that in some parts of the world, the climates in the past had been very different from today's. Evidence included glacial deposits in areas that are now tropical and fossils of tropical plants in areas that are now very cold. What was German meteorologist Alfred Wegener's explanation for these observations?

    a. Earth's north and south poles wander over time.
    b. The tilt of Earth's axis changes slowly over time.
    c. Earth's continents are not fixed but instead move slowly over Earth's surface.*
    d. New ocean crust forms at mid-ocean ridges while old cold ocean crust sinks back into the mantle.

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.1 Continental Drift*.

2. According to Alfred Wegener, the presence of Permian-aged *Mesosaurus* fossils in both Brazil and Africa was evidence that:

    a. A global flood scattered remains of organisms across Earth's surface.
    b. South America and Africa were once joined as part of a single continent.*
    c. *Mesosaurus* was able to swim much farther than paleontologists had previously inferred.
    d. *Mesosaurus* was evidence of convergent evolution, in which two different organisms living in different parts of the world, evolve into similar species.

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.1 Continental Drift*.

3. Which is a primary reason that Alfred Wegener's idea of continental drift was not accepted by most geologists during his lifetime?

    a. He could not explain the presence of hotspots.
    b. He was not able to explain why the continents did not fit together perfectly.
    c. He was not able to provide evidence for continental drift on planets other than Earth.
    d. He did not propose a viable mechanism to explain why continental drift would happen.*

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.1 Continental Drift*.

4. Which piece of evidence did Alfred Wegener NOT use to support his idea of continental drift?

    a. Locations of fossil plants
    b. Evidence for glaciation in regions that are now tropical

c. Relationship between ocean trenches and earthquakes*
d. Continuity of ancient mountain belts from one continent to another

**Feedback for incorrect answers:** Incorrect. Review *Section 2.1 Continental Drift*.

5. Which mechanism did Alfred Wegener propose to explain the hypothesized motion of continents over time?

    a. Convection of hot rock within Earth's mantle
    b. Changes in the orbital velocity of Earth around the Sun
    c. The gravitational attraction of Earth's equatorial bulge*
    d. Forces exerted by volcanism at the mid-ocean ridges and subduction at deep sea trenches

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.1 Continental Drift*.

6. Earth's magnetic poles reverse approximately once every:

    a. 27 to 28 days
    b. 9 to 11 years
    c. 100,000 to several million years*
    d. 2 to 3 billion years

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.2 Paleomagnetism*.

7. Earth's magnetic poles appear to have wandered over time. Which observation would be evidence that the continents, not the poles, have moved?

    a. The path of apparent motion connects continents to each other.
    b. The paths of apparent motion of the poles are different on different continents.*
    c. The paths of apparent motion of the poles are exactly the same on each continent.
    d. The path of apparent motion on the southern continents is symmetrical to the path on the northern continents.

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.2 Paleomagnetism*.

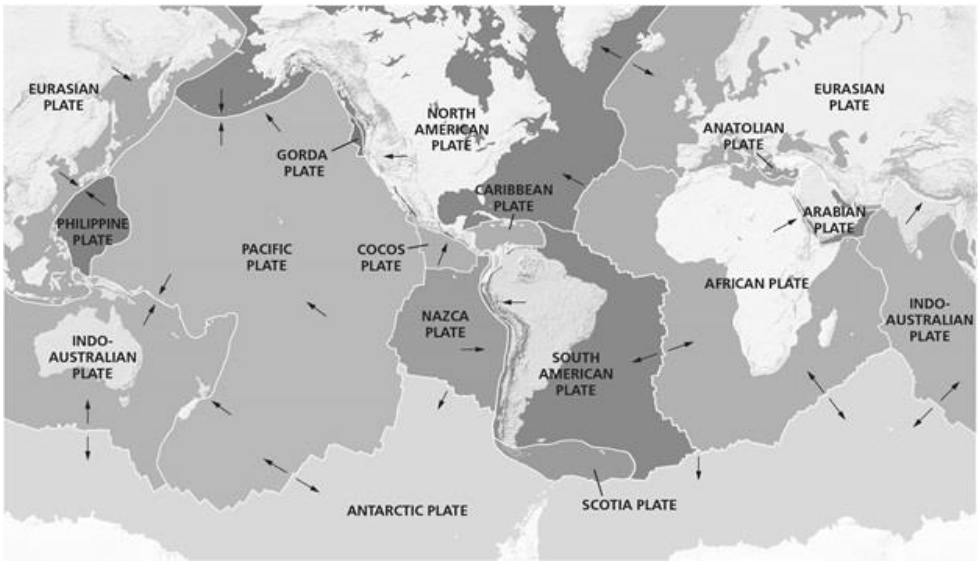
8. Geologists have long wondered whether the planet Mars has also experienced plate tectonics. Which would be the most convincing evidence for plate tectonics on Mars?

    a. Giant volcanoes scattered randomly across the surface

b. Deep canyons that appear to be shaped by running water
c. Symmetrical patterns of magnetic anomalies in the rocks on the surface*
d. The presence of high, continent-like regions and low, ocean basin-like regions

**Feedback for incorrect answers:** Incorrect. Review *Section 2.3 Seafloor Spreading*.

9. A group of geologists want to collect samples of very young volcanic rocks from the ocean floor. Which location is would be best?




a. The Chilean Trench
b. The Southwest Indian Ridge*
c. The middle of the Antarctic Plate
d. The passive margin of South America

**Feedback for incorrect answers:** Incorrect. Review *Section 2.3 Seafloor Spreading*.

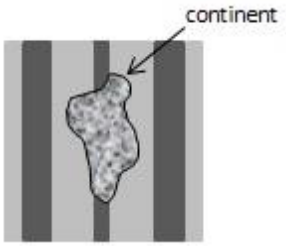
10. The pattern of magnetic anomalies along the seafloor is evidence that:

a. Magnetic poles wander over time
b. Seafloor is recycled at deep ocean trenches
c. Ocean floor spreads apart along mid-ocean ridges*
d. Convection in the mantle causes continents to drift

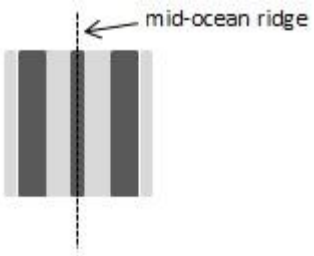
**Feedback for incorrect answers:** Incorrect. Review *Section 2.3 Seafloor Spreading*.

11. Which best represents the pattern of magnetic stripes on the seafloor? For each choice, dark gray represents normal polarity while light gray represents reverse polarity.

a.

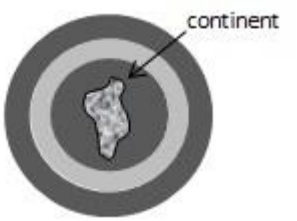


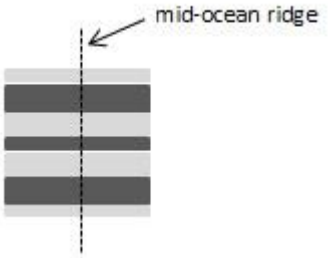

b.




*

c.



d. 


**Feedback for incorrect answers:** Incorrect. Review *Section 2.3 Seafloor Spreading.*

12. Geologists drill a series of cores in order to collect samples of ocean crust throughout the oceans. They then use these cores to estimate the age of the crust. What are they most likely to find?

    a. The age of the crust is roughly the same throughout the ocean basin.
    b. The age of the crust increases from the mid-ocean ridge to the continents, in a line roughly perpendicular to the ridge.*
    c. The age of the crust increases from one side of the ocean to the other.
    d. The age of the crust increases from the center point of the ocean, radially out in all directions.

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.3 Seafloor Spreading*.

13. Which is the best evidence for subduction?

    a. The pattern of magnetic anomalies on the seafloor
    b. The pattern of earthquake foci near deep sea trenches*
    c. The pattern of hotspots in the oceans and on continents
    d. The pattern of apparent polar wander in continental rocks

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.4 Subduction.*

14. Arcs of volcanic islands are closely associated with:

    a. Continental shelves
    b. Deep sea trenches*
    c. Hotspot volcanoes
    d. Mid-ocean ridges

**Feedback for incorrect answers:** Incorrect. Review *Section 2.4 Subduction.*

15. Which occurs when oceanic lithosphere (slab) is subducted?

    a. Heat from Earth's interior causes the slab to heat up, melt, and erupt.
    b. A decrease in pressure above the slab causes the mantle above to melt and erupt.
    c. Water is released from the slab, causing the mantle above to melt and erupt.*
    d. An increase in pressure causes the slab and the overlying mantle to melt and erupt.

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.4 Subduction.*

16. Plate tectonics is known as a scientific theory or a paradigm. A paradigm is best defined as:

    a. A unifying principle*
    b. An untested hypothesis
    c. An important piece of evidence
    d. A theory that has been replaced

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

17. Wegener's hypothesis of continental drift was eventually:

    a. Applied to all other planets in the Solar System
    b. Accepted by geologists in the form that he originally conceived it
    c. Abandoned by all scientists because it was not supported by any hard evidence
    d. Replaced by the theory of plate tectonics, a modified and more complete version of the idea*

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

18. A geologist makes a map showing the locations of current plate boundaries. The boundaries are most likely to coincide with:

    a. Tracks of hotspots
    b. Lines of latitude
    c. Edges of continents
    d. Locations of earthquakes*

**Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

19. A mid-ocean ridge segment is an example of a:

    a. Convergent boundary
    b. Divergent boundary*
    c. Passive margin
    d. Transform boundary

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

20. Geologists have found evidence for plate tectonics on Jupiter's moon Europa. Unlike Earth, however, Europa's lithosphere is made of water ice floating on a mantle of liquid water. "Dilational bands" are areas on Europa where the ice seems to be pulling apart. Liquid water flows up from below, filling the gap and then freezing. To which feature on Earth are dilational bands most similar?

    a. Transform faults
    b. Mid-ocean ridges*
    c. Deep sea trenches
    d. Hotspot volcanoes

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

21. The Alpine fault is a transform boundary between the Pacific Plate and the Australian Plate. The fault runs through the South Island of New Zealand. Hokitika is a town on the Australian Plate. Hanmer is a town on the Pacific Plate. What is most likely to happen to these towns over time?




a. Hokitika will be covered in lava.
b. Hokitika will subduct beneath Hanmer Springs.
c. Hokitika and Hanmer Springs will be rifted apart.
d. Hokitika and Hanmer Springs will move closer to each other.*

**Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

22. The Atlantic coast of the United States is referred to as a passive margin because:

a. There are no hotspots located along it
b. It lies in the middle of a plate, not along a plate boundary*
c. It is stationary while the Atlantic Ocean plate subducts beneath it
d. It lies along a transform boundary that has not been active in human history

**Feedback for incorrect answers:** Incorrect. Review *Section 2.5 Moving Plates and Plate Boundaries*.

23. Which best describes hotspots?

    a. Places where continents are beginning to rift apart
    b. Curved arcs of volcanoes associated with deep sea trenches
    c. Locations of active volcanism not apparently related to plate tectonics*
    d. Linear chains of submarine volcanoes that run down the center of an ocean floor

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.6 Hotspots: A Plate Tectonic Enigma.*

24. Olympus Mons, on the surface of Mars, is the largest volcano known in the Solar System—more than 600 km across, 25 km high, and with a volume roughly 100 times greater than that of Mauna Loa, the largest volcano on Earth. Both Olympus Mons and Mauna Loa are hotspot volcanoes. What is the main reason geologists think that Mauna Loa is not as big as Olympus Mons?

    a. Mars' climate is colder and drier than Earth's.
    b. A year on Mars lasts nearly twice as long as a year on Earth.
    c. Earth's gravitational pull is about three times greater than that on Mars.
    d. Earth's lithosphere is currently in motion relative to the mantle while Mars' is not.*

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.6 Hotspots: A Plate Tectonic Enigma.*

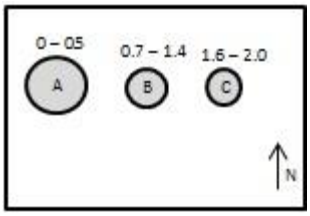
25. Many geologists think that hotspot magma originates:

    a. Along transform boundaries
    b. In the mantle below the mid-ocean ridges
    c. In the mantle above subducting ocean crust
    d. At the boundary between Earth's mantle and core*

    **Feedback for incorrect answers:** Incorrect. Review *Section 2.6 Hotspots: A Plate Tectonic Enigma.*

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26. The sketch shows three hotspot volcanoes and the ages of lava flows on those volcanoes in millions of years. What can be inferred about the motion of the tectonic plate that these volcanoes are on?




a. The plate is rotating about Volcano B.
b. The plate is moving roughly East to West.
c. The plate is moving roughly West to East.*
d. The motion of the plate cannot be inferred from the information provided.

**Feedback for incorrect answers:** Incorrect. Review *Section 2.6 Hotspots: A Plate Tectonic Enigma.*