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| 1. Who proposed the theory of continental drift?   |  |  |  | | --- | --- | --- | |  | a. | Charles Darwin | |  | b. | Harry Hess | |  | c. | Alfred Wegener | |  | d. | J. Tuzo Wilson |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 2. Which one of the following concepts was developed earliest?   |  |  |  | | --- | --- | --- | |  | a. | continental drift | |  | b. | plate tectonics | |  | c. | seafloor spreading | |  | d. | All three concepts were developed at approximately the same time. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 3. How old are the fossils of the reptile *Mesosaurus* found in Africa and South America that suggest the two continents were once together?   |  |  |  | | --- | --- | --- | |  | a. | approximately 100 million years | |  | b. | approximately 1.0 billion years | |  | c. | approximately 300 million years | |  | d. | approximately 3.0 billion years |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 4. When was the theory of plate tectonics developed?   |  |  |  | | --- | --- | --- | |  | a. | 1860s | |  | b. | 1920s | |  | c. | 1940s | |  | d. | 1960s |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 5. New lithosphere is created   |  |  |  | | --- | --- | --- | |  | a. | in deep-sea trenches. | |  | b. | in subduction zones. | |  | c. | at mid-ocean ridges. | |  | d. | along transform faults. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 6. In which ocean are most of the world’s convergent plate margins located?   |  |  |  | | --- | --- | --- | |  | a. | Arctic Ocean | |  | b. | Atlantic Ocean | |  | c. | Indian Ocean | |  | d. | Pacific Ocean |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 7. The east coast of North America is   |  |  |  | | --- | --- | --- | |  | a. | a convergent plate boundary. | |  | b. | a transform plate boundary. | |  | c. | a divergent plate boundary. | |  | d. | not a plate boundary. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 8. Which of the following is associated with a divergent plate boundary?   |  |  |  | | --- | --- | --- | |  | a. | earthquakes | |  | b. | volcanism | |  | c. | rifting | |  | d. | all of the above |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 9. Which one of the following is a divergent plate boundary?   |  |  |  | | --- | --- | --- | |  | a. | the Andes Mountains | |  | b. | the Mid-Atlantic Ridge | |  | c. | the Himalayan Mountains | |  | d. | the San Andreas fault |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 10. At what type of plate boundary do the deepest earthquakes occur?   |  |  |  | | --- | --- | --- | |  | a. | convergent | |  | b. | divergent | |  | c. | transform | |  | d. | All types of plate boundaries have deep earthquakes. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 11. Approximately how deep (below sea level) are the deepest deep-sea trenches?   |  |  |  | | --- | --- | --- | |  | a. | 3 km | |  | b. | 10 km | |  | c. | 30 km | |  | d. | 100 km |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 12. Which one of the following is not associated with convergent plate boundaries?   |  |  |  | | --- | --- | --- | |  | a. | earthquakes | |  | b. | deep-sea trenches | |  | c. | spreading centers | |  | d. | volcanoes |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 13. Which one of the following occurs at a convergent plate boundary?   |  |  |  | | --- | --- | --- | |  | a. | rifting | |  | b. | seafloor spreading | |  | c. | adding seafloor | |  | d. | subduction |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 14. Which one of the following mountain ranges formed as a result of ocean-continent convergence?   |  |  |  | | --- | --- | --- | |  | a. | the Andes | |  | b. | the Appalachians | |  | c. | the Himalayas | |  | d. | the Urals |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 15. When a deep-sea trench is located next to a continent, where would you expect to find active volcanoes?   |  |  |  | | --- | --- | --- | |  | a. | on the ocean side of the trench | |  | b. | in the deep-sea trench | |  | c. | on the continent side of the trench | |  | d. | on both the ocean side and continent side of the trench |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 16. What plate is subducting beneath southwestern Canada and the northwestern United States?   |  |  |  | | --- | --- | --- | |  | a. | the Cocos Plate | |  | b. | the Nazca Plate | |  | c. | the Juan de Fuca Plate | |  | d. | the Pacific Plate |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 17. The west coast of South America is   |  |  |  | | --- | --- | --- | |  | a. | a convergent plate boundary. | |  | b. | a transform-fault boundary. | |  | c. | a divergent plate boundary. | |  | d. | not a plate boundary. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 18. Which of the following is an example of a transform plate boundary?   |  |  |  | | --- | --- | --- | |  | a. | the East African Rift | |  | b. | the Mid-Atlantic Ridge | |  | c. | the Marianas Trench | |  | d. | the San Andreas Fault |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 19. What type of plate boundary is parallel to the direction of plate movement?   |  |  |  | | --- | --- | --- | |  | a. | convergent plate boundary | |  | b. | transform-fault plate boundary | |  | c. | divergent plate boundary | |  | d. | all of the above |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 20. Which one of the following mountain ranges is the product of continent-continent convergence?   |  |  |  | | --- | --- | --- | |  | a. | the Andes | |  | b. | the Cascade Range | |  | c. | the Himalayas | |  | d. | the Japanese islands |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 21. The North American Plate is bounded by \_\_\_\_\_\_ plate boundaries.   |  |  |  | | --- | --- | --- | |  | a. | convergent | |  | b. | transform | |  | c. | divergent | |  | d. | convergent, divergent, and transform |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 22. Which of the following is used to determine the past rates of plate motion?   |  |  |  | | --- | --- | --- | |  | a. | astronomical position of the center of the lithospheric plate | |  | b. | seafloor magnetic anomalies across the lithospheric plate | |  | c. | global positioning system used to determine the location of the center of the lithospheric plate | |  | d. | all of the above |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 23. Modern seafloor spreading rates range from   |  |  |  | | --- | --- | --- | |  | a. | 0.2 to 1.5 millimeters per year. | |  | b. | 2 to 15 meters per year. | |  | c. | 2 to 15 centimeters per year. | |  | d. | 2 to 15 kilometers per year. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 24. What two scientists related the positive and negative magnetic bands on the seafloor to seafloor spreading?   |  |  |  | | --- | --- | --- | |  | a. | Charles Darwin and James Hutton | |  | b. | F. J. Vine and D. H. Mathews | |  | c. | Harry Hess and Robert Dietz | |  | d. | Alfred Wegener and Arthur Holmes |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 25. Which one of the following is commonly used to determine the age of seafloor samples recovered by the deep-sea drilling project?   |  |  |  | | --- | --- | --- | |  | a. | geodetic measurements | |  | b. | foraminifera fossils | |  | c. | chemical composition | |  | d. | gravity measurements |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 26. Which one of the following plates is moving the fastest?   |  |  |  | | --- | --- | --- | |  | a. | the African Plate | |  | b. | the North American Plate | |  | c. | the Eurasian Plate | |  | d. | the Pacific Plate |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 27. On a map of the seafloor, the boundaries between normally magnetized oceanic crust and reversely magnetized oceanic crust are called   |  |  |  | | --- | --- | --- | |  | a. | dipoles. | |  | b. | isochrons. | |  | c. | isograds. | |  | d. | sutures. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 28. When was the supercontinent of Pangaea assembled?   |  |  |  | | --- | --- | --- | |  | a. | approximately 100 million years ago | |  | b. | approximately 1.0 billion years ago | |  | c. | approximately 250 million years ago | |  | d. | approximately 2.5 billion years ago |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 29. How old are the oldest rocks on the ocean floor?   |  |  |  | | --- | --- | --- | |  | a. | approximately 20 million years old | |  | b. | approximately 600 million years old | |  | c. | approximately 200 million years old | |  | d. | approximately 4.0 billion years old |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 30. The oldest continental rocks are \_\_\_\_\_\_\_\_\_\_ than the oldest oceanic rocks.   |  |  |  | | --- | --- | --- | |  | a. | much older | |  | b. | slightly older | |  | c. | slightly younger | |  | d. | much younger |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 31. Isochrons on the seafloor are roughly \_\_\_\_\_\_\_\_\_\_ the ridge axis along which they were created.   |  |  |  | | --- | --- | --- | |  | a. | parallel to and symmetric about | |  | b. | perpendicular to and symmetric about | |  | c. | parallel to, but not symmetric about | |  | d. | perpendicular to, but not symmetric about |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 32. Why are isochrons on the Pacific seafloor more widely spaced than isochrons on the Atlantic seafloor?   |  |  |  | | --- | --- | --- | |  | a. | The Pacific seafloor formed at a faster spreading rate than the Atlantic seafloor. | |  | b. | The Pacific seafloor formed at a slower spreading rate than the Atlantic seafloor. | |  | c. | The Pacific seafloor is older than the Atlantic seafloor. | |  | d. | The Pacific seafloor is younger than the Atlantic seafloor. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 33. What ocean used to lie between Africa and Eurasia and was the ancestor to today’s Mediterranean Sea?   |  |  |  | | --- | --- | --- | |  | a. | Gondwana | |  | b. | Panthalassa | |  | c. | Rodinia | |  | d. | Tethys |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 34. When did the supercontinent Pangaea begin to break apart?   |  |  |  | | --- | --- | --- | |  | a. | approximately 65 million years ago | |  | b. | approximately 570 million years ago | |  | c. | approximately 200 million years ago | |  | d. | approximately 1.5 billion years ago |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 35. Pangaea split into two continents: Laurasia, made up of the northern continents, and \_\_\_\_\_\_, made up of the southern continents.   |  |  |  | | --- | --- | --- | |  | a. | Tethys | |  | b. | Panthalassa | |  | c. | Gondwana | |  | d. | Cascadia |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 36. When did India begin to collide with Asia to form the Himalayas?   |  |  |  | | --- | --- | --- | |  | a. | approximately 50 million years ago | |  | b. | approximately 500 million years ago | |  | c. | approximately 200 million years ago | |  | d. | approximately 2.0 billion years ago |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 37. Compared with slower moving plates, faster moving plates are bounded by a greater proportion of   |  |  |  | | --- | --- | --- | |  | a. | continent collision zones. | |  | b. | subduction zones. | |  | c. | mid-ocean ridges. | |  | d. | transform faults. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 38. What drives plate tectonics?   |  |  |  | | --- | --- | --- | |  | a. | magnetic reversals | |  | b. | mantle convection | |  | c. | solar energy | |  | d. | volcanism |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 39. Which one of the following forces is important in driving plate tectonics?   |  |  |  | | --- | --- | --- | |  | a. | the pulling force of a sinking lithospheric slab | |  | b. | the pushing force of a plate sliding off a mid-ocean ridge | |  | c. | the suction force of a retreating subduction zone | |  | d. | all of the above |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 40. How deep are plates subducted?   |  |  |  | | --- | --- | --- | |  | a. | 100 km | |  | b. | 700 km | |  | c. | 2900 km | |  | d. | 6400 km |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 41. Regions of intense localized volcanism, such as Hawaii, form above plumes of fast-rising material that originate in the   |  |  |  | | --- | --- | --- | |  | a. | crust. | |  | b. | deep mantle. | |  | c. | lithosphere. | |  | d. | outer core. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 42. The Hawaiian volcanoes are   |  |  |  | | --- | --- | --- | |  | a. | located at a convergent plate boundary. | |  | b. | located at a divergent plate boundary. | |  | c. | located at a transform plate boundary. | |  | d. | in the middle of a tectonic plate. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 43. New oceanic crust is created at   |  |  |  | | --- | --- | --- | |  | a. | subduction zones. | |  | b. | deep-sea trenches. | |  | c. | mid-ocean ridges. | |  | d. | transform boundaries. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 44. Shallow focus earthquakes are associated with which type of plate boundary?   |  |  |  | | --- | --- | --- | |  | a. | divergent | |  | b. | convergent | |  | c. | transform | |  | d. | all of the above |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 45. Mid-ocean ridges are also referred to as   |  |  |  | | --- | --- | --- | |  | a. | spreading centers. | |  | b. | hot spots. | |  | c. | island arcs. | |  | d. | trench zones. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 46. An island arc forms when there is \_\_\_\_\_\_\_\_\_\_ convergence.   |  |  |  | | --- | --- | --- | |  | a. | ocean-continent | |  | b. | ocean-ocean | |  | c. | continent-continent | |  | d. | island-continent |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 47. The convergence of the North American Plate with the Juan de Fuca Plate forms the \_\_\_\_\_\_ subduction zone.   |  |  |  | | --- | --- | --- | |  | a. | Marianas | |  | b. | Andean | |  | c. | Aleutian | |  | d. | Cascadia |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 48. Mount St. Helens is part of the   |  |  |  | | --- | --- | --- | |  | a. | Andes Mountains. | |  | b. | Mid-Atlantic Ridge. | |  | c. | Himalayan Mountains. | |  | d. | Cascade Range. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 49. The Great Rift Valley of East Africa is a   |  |  |  | | --- | --- | --- | |  | a. | convergent boundary. | |  | b. | divergent boundary. | |  | c. | transform boundary. | |  | d. | deep-sea trench. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 50. The Appalachian Mountains formed from an ancient \_\_\_\_\_\_\_\_\_\_\_\_ plate boundary.   |  |  |  | | --- | --- | --- | |  | a. | convergent | |  | b. | transform | |  | c. | divergent | |  | d. | converform |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 51. Oceanic crust that records negative magnetic anomalies formed when the Earth’s magnetic field was   |  |  |  | | --- | --- | --- | |  | a. | the same as it is today. | |  | b. | the same as today, except weaker. | |  | c. | reversed from what it is today. | |  | d. | the same as today, except stronger. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 52. Geodetic positioning measures points on the Earth’s surface relative to   |  |  |  | | --- | --- | --- | |  | a. | the position of Mars. | |  | b. | the position of known comets. | |  | c. | the position of the Moon. | |  | d. | the position of fixed stars. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 53. If the position between antennas on two plates moving away from each other changes by 5 mm/yr, then each plate is moving at approximately   |  |  |  | | --- | --- | --- | |  | a. | 5 mm/yr. | |  | b. | 2.5 mm/yr. | |  | c. | 10 mm/yr. | |  | d. | 1 mm/yr. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 54. Rodinia is a supercontinent that formed   |  |  |  | | --- | --- | --- | |  | a. | after Pangea. | |  | b. | at the same time as Pangea. | |  | c. | before Pangea. | |  | d. | Geoscientists have no idea when Rodinia was formed. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 55. Geoscientists predict the east coast of North America will be \_\_\_\_\_\_\_\_\_\_\_\_\_ 50 million years in the future.   |  |  |  | | --- | --- | --- | |  | a. | a divergent plate boundary | |  | b. | a transform plate boundary | |  | c. | a convergent plate boundary | |  | d. | the same as it is today |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 56. The main type of plate boundaries are (proper names only):   |  |  |  | | --- | --- | --- | |  | a. | transform, sliding-past, scissor. | |  | b. | convergent, colliding, crumbling. | |  | c. | divergent, pull-apart, spreading. | |  | d. | convergent, transform, divergent. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 57. What kind of plate boundary defines the eastern edge of the plate we live on in the United States?   |  |  |  | | --- | --- | --- | |  | a. | deep sea trench | |  | b. | mid-ocean rift | |  | c. | continental spreading center | |  | d. | transform fault |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 58. How do we determine absolute direction of plate movement over millions of years?   |  |  |  | | --- | --- | --- | |  | a. | with astronomical positioning | |  | b. | with the global positioning system (GPS) | |  | c. | with seafloor isochrons | |  | d. | by looking at the alignment of mountain ranges on the continents |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 59. \_\_\_\_\_\_\_\_\_\_ are the most extensive mountain ranges on Earth today.   |  |  |  | | --- | --- | --- | |  | a. | The Alps | |  | b. | The Himalayas | |  | c. | The Rockies | |  | d. | Mid-oceanic ridges |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 60. Who first described world tectonics in terms of rigid plates?   |  |  |  | | --- | --- | --- | |  | a. | Alfred Wegener | |  | b. | Harry Hess | |  | c. | Tuzo Wilson | |  | d. | Robert Dietz |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 61. Who first proposed the three different kinds of plate boundaries widely accepted today?   |  |  |  | | --- | --- | --- | |  | a. | Tuzo Wilson | |  | b. | Alfred Wegener | |  | c. | Robert Dietz | |  | d. | Harry Hess |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 62. Which of the following locations is least likely to have active volcanoes?   |  |  |  | | --- | --- | --- | |  | a. | mid-oceanic ridge | |  | b. | continental rift valley | |  | c. | transform fault | |  | d. | island arc |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 63. How many major plates cover the Earth’s surface?   |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 5 | |  | c. | 13 | |  | d. | 30 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 64. Which of the following plates is the largest?   |  |  |  | | --- | --- | --- | |  | a. | Cocos Plate | |  | b. | Indian Plate | |  | c. | North American Plate | |  | d. | Pacific Plate |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 65. Which of the following plates contains only oceanic crust?   |  |  |  | | --- | --- | --- | |  | a. | North Atlantic Plate | |  | b. | Australian Plate | |  | c. | Nazca Plate | |  | d. | African Plate |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 66. Who first suggested that the Earth’s surface might be a fragile shell resting on fluid?   |  |  |  | | --- | --- | --- | |  | a. | Alfred Wegener | |  | b. | Harry Hess | |  | c. | Benjamin Franklin | |  | d. | Arthur Holmes |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 67. \_\_\_\_\_\_\_\_\_\_ was the first Earth scientist to propose a rudimentary form of seafloor spreading.   |  |  |  | | --- | --- | --- | |  | a. | Arthur Holmes | |  | b. | Harry Hess | |  | c. | Alfred Wegener | |  | d. | Tuzo Wilson |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 68. Which scientist was the first to suggest the existence of so-called “supercontinents”?   |  |  |  | | --- | --- | --- | |  | a. | German Alfred Wegner | |  | b. | Austrian Eduard Suess | |  | c. | Canadian Tuzo Wilson | |  | d. | British Arthur Holmes |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 69. Roughly when did most Earth scientists accept plate tectonics as a theory?   |  |  |  | | --- | --- | --- | |  | a. | 1960 | |  | b. | 1970 | |  | c. | 1980 | |  | d. | 1990 |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 70. Compared with oceanic crust the continental crust is generally lighter, \_\_\_\_ and \_\_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | weaker; thinner | |  | b. | stronger; thinner | |  | c. | weaker; thicker | |  | d. | stronger; thicker |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 71. Compared with oceanic rifts, the continental rifts generally lack   |  |  |  | | --- | --- | --- | |  | a. | rift valleys. | |  | b. | earthquakes. | |  | c. | volcanic activity. | |  | d. | transform faults. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 72. Where is the best place to explore the mid-ocean ridge as it comes on land?   |  |  |  | | --- | --- | --- | |  | a. | Ireland | |  | b. | Iceland | |  | c. | Norway | |  | d. | Africa |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 73. Most transform-fault boundaries are typically associated with   |  |  |  | | --- | --- | --- | |  | a. | subduction zones. | |  | b. | continental rifts. | |  | c. | oceanic rifts. | |  | d. | mountain ranges. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 74. The North American Plate is bounded on the west with \_\_\_\_\_ boundaries and the east with \_\_\_ boundaries.   |  |  |  | | --- | --- | --- | |  | a. | convergent and transform; divergent | |  | b. | divergent; convergent and transform | |  | c. | transform; convergent | |  | d. | divergent; transform |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 75. Deep focus earthquakes are typically associated with which type of plate boundary?   |  |  |  | | --- | --- | --- | |  | a. | divergent | |  | b. | convergent | |  | c. | transform | |  | d. | all of the boundaries |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 76. Which type of measurements initially led to determining the rate of plate movement with a high degree of accuracy?   |  |  |  | | --- | --- | --- | |  | a. | geodesy | |  | b. | astronomical positioning | |  | c. | radio telescopes | |  | d. | GPS |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 77. Which type of measurements are currently used to determine the rate of plate movement with a high degree of accuracy?   |  |  |  | | --- | --- | --- | |  | a. | geodesy | |  | b. | astronomical positioning | |  | c. | radio telescopes | |  | d. | GPS |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 78. The width of seafloor isochrons is directly related to   |  |  |  | | --- | --- | --- | |  | a. | their distance from a mid-ocean ridge. | |  | b. | their age. | |  | c. | spreading rate. | |  | d. | the frequency of magnetic reversals. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 79. Given the current plate configuration, we would expect the distance between which of the following cites to increase?   |  |  |  | | --- | --- | --- | |  | a. | Los Angles and New York | |  | b. | New York and London | |  | c. | London and Moscow | |  | d. | Honolulu and Tokyo |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 80. Roughly how long has the North American Plate been around?   |  |  |  | | --- | --- | --- | |  | a. | 6 thousand years | |  | b. | 6 million years | |  | c. | 60 million years | |  | d. | 600 million years |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 81. Assuming that the direction and rates of plate movement will remain constant for the next 50 million years, how will the distance between London and New York change?   |  |  |  | | --- | --- | --- | |  | a. | It will remain the same. | |  | b. | It will decrease. | |  | c. | It will increase. | |  | d. | It is impossible to predict. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 82. What is not possible to explain with the theory of plate tectonics?   |  |  |  | | --- | --- | --- | |  | a. | where volcanoes erupt | |  | b. | where earthquakes occur | |  | c. | the phases of the moon | |  | d. | the locations of mountains |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 83. What was not used by Wegner to propose the existence of Pangea?   |  |  |  | | --- | --- | --- | |  | a. | the distribution of Mesosaurus | |  | b. | seafloor spreading | |  | c. | matching rock assemblages | |  | d. | the close fit of the continents |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 84. Marie Tharp contributed to the revolutionary theory of plate tectonics by   |  |  |  | | --- | --- | --- | |  | a. | mapping the seafloor. | |  | b. | showing that the ocean floor is made mostly of basalt. | |  | c. | showing that the ocean floor is made mostly of granite. | |  | d. | describing the process of seafloor spreading. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 85. What is the Ring of Fire?   |  |  |  | | --- | --- | --- | |  | a. | a region of intense volcanic activity around the Pacific Ocean | |  | b. | a region of earthquake activity around the Pacific Ocean | |  | c. | the heating of Antarctica due to the creation of the ozone hole | |  | d. | evidence that the seafloor is being recycled |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 86. A reasonable rate of motion of across the western boundary of the South American Plate is   |  |  |  | | --- | --- | --- | |  | a. | 73 mm/y. | |  | b. | 73 in/y. | |  | c. | 73 ft /y. | |  | d. | 73 km/y. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 87. Any given plate has the same kind of plate boundary (divergent, convergent, or transform) all around it.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | |

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| 88. A volcanic arc is associated with subduction   |  |  |  | | --- | --- | --- | |  | a. | of a mid-ocean ridge. | |  | b. | at a rift zone. | |  | c. | at an ocean-ocean convergent plate boundary. | |  | d. | at an ocean-continental convergent plate boundary. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 89. The breakup of Pangea was likely begun with the formation of a   |  |  |  | | --- | --- | --- | |  | a. | a mid-ocean ridge. | |  | b. | a rift valley. | |  | c. | an island arc. | |  | d. | a subduction zone. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 90. The magnetic time scale shows geologists that   |  |  |  | | --- | --- | --- | |  | a. | the North magnetic pole has always been at the North Pole. | |  | b. | the South magnetic pole has shifted to the North magnetic pole only over the last 5 million years. | |  | c. | the Earth’s magnetic field changes about every 200,000 years. | |  | d. | volcanoes have erupted every 200,000 years. |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 91. Seafloor spreading was explained by   |  |  |  | | --- | --- | --- | |  | a. | measuring the increasing width of the ocean basins. | |  | b. | measuring the age of the seafloor at various known locations. | |  | c. | recording high and low magnetic field strength variations in the rocks on the seafloor. | |  | d. | observing mantle plumes, like Hawaii. |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 92. What are the two pieces of information needed to determine the age of the seafloor?   |  |  |  | | --- | --- | --- | |  | a. | the magnetic field anomaly and the kind of the nearest plate tectonic boundary | |  | b. | the magnetic field anomaly and the geodetic position of the plate | |  | c. | the precise location of the center of the lithospheric plate and the kind of the nearest plate tectonic boundary | |  | d. | the magnetic field anomaly and the geologic ages of several known places on the seafloor |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 93. The ocean floor age, as shown by isochrons, is only as old as Pangea because during the rest of the history of the Earth going back to 4.6 billion years,   |  |  |  | | --- | --- | --- | |  | a. | the ocean floor was consumed at subduction zones. | |  | b. | the ocean floor was only created at subduction zones. | |  | c. | the rest of the ocean floor was metamorphosed to mountain chains. | |  | d. | geodetic measurements of the ocean floor only extend to 280 million years. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 94. Isochrons on the seafloor are parallel to   |  |  |  | | --- | --- | --- | |  | a. | magnetic anomalies on the seafloor. | |  | b. | hot-spot trails on the seafloor. | |  | c. | transform plate boundaries. | |  | d. | rift zones on the continent. |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 95. What is not possible to interpret, using plate tectonics?   |  |  |  | | --- | --- | --- | |  | a. | global warming | |  | b. | climate change | |  | c. | rock formation | |  | d. | mountain building |  |  |  | | --- | --- | | *ANSWER:* | a | |