

Section One (60%). Please carefully read each question and respond appropriately.

Matching. Match the term or person with the appropriate phrase. You may use each answer once, more than once or not at all.

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| _____ 1. Balboa | A. made important observations about drift of sea ice |
| _____ 2. Eratosthenes | B. used ecological approach to solve fisheries problem |
| _____ 3. Magellan | C. established temporary settlement in North America |
| _____ 4. Ptolemy | D. incorrectly concluded that no life exists in deep ocean |
| _____ 5. Vikings | E. first European explorer to Pacific Ocean |
| | F. mapped the Mediterranean Sea for the Greeks |
| | G. important observations on ocean chemistry |
| | H. led voyage that first circumnavigated the globe |
| | I. first determination of Earth's circumference |
| | J. mapped world with Roman knowledge showing latitude and longitude |
| | K. led voyage that first used the marine chronometer |

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| _____ 6. core | A. Big Bang |
| _____ 7. crust | B. composed of iron and nickel, liquid outer layer and solid inner layer |
| _____ 8. galaxy | C. gaseous and dusty space cloud |
| _____ 9. mantle | D. Milky Way |
| _____ 10. nebula | E. outermost portion of the Earth, basalt and granite |
| | F. rich in ferromagnesian minerals, between crust and core |
| | G. solar winds |

11. All of the following are TRUE concerning the deepest part of the ocean except:
- The bottom of the trench was visited by Piccard and Walsh in the Trieste in 1960.
 - The deepest part of the ocean is located in a trench off the coast of Japan.
 - The depth of the trench exceeds the height of Mount Everest.
 - The depth of the trench is estimated at 12,500 meters.
 - The trench is called the Mariana Trench.
12. The most accurate scientific estimation of the age of Earth is based on
- calculation of the Earth's cooling history.
 - the thickness of sediments in the ocean basins.
 - radiometric methods of determining the age of meteorites and moon rocks.
 - determining the rate of change of seawater salinity.
 - counting generations of people back in time.
13. The subdivisions of the geologic time scale
- have been set up so that all eras are of equal time interval.
 - were initially based on fossil evidence, extinctions, and boundaries of sedimentary rock units.
 - could not be established until radiometric dating methods had been developed.
 - have been set up so that the eras representing older dates are of a progressively longer time interval.

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14. Which of the following gases was absent from the Earth's early atmosphere?
- A. carbon dioxide
 - B. hydrogen
 - C. helium
 - D. oxygen
15. What physical property of Earth's layers determines the order in which they are layered?
- A. boiling point
 - B. density
 - C. temperature
 - D. mass
16. Given that continental crust is thicker than oceanic crust, why doesn't isostatic adjustment cause the continents to sink below the ocean?
- A. The ocean water is too heavy for the continents to move out of the way.
 - B. Isostatic adjustment only allows continents to move horizontally, not vertically.
 - C. The continents are made of basalt, which is much lower in density than the granite of which the ocean crust is made.
 - D. Continental crust is less dense than oceanic crust.
17. What would be the best way to describe the asthenosphere?
- A. solid
 - B. gaseous
 - C. plastic
 - D. molten
18. A volcanic arc forms near where there is
- A. a hotspot.
 - B. subduction.
 - C. transform faulting.
 - D. sea floor spreading.
19. How is it that the floor of the ocean is so much younger than the ocean itself?
- A. It is because radioactive age dating techniques are still so uncertain.
 - B. It is because the ocean floor keeps regenerating itself.
 - C. It is because we've never drilled into the ocean floor very far.
 - D. It is because the sediment that is deposited on top of the ocean floor is so young.
20. As one moves away from the axis of a mid-ocean ridge, the
- A. lithosphere thickens.
 - B. rate of heat flow increases.
 - C. age of the ocean floor decreases.
 - D. water depth decreases.
 - E. all of the above occur.

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21. Paleomagnetism is a key piece of evidence that helps support plate tectonics because it can be used to show
- A. the amount of steel in Earth's crust.
 - B. the spreading of the sea floor.
 - C. whether fossils are of animals that used the magnetic poles to navigate.
 - D. how much Earth's magnetic poles have moved.
22. Plate boundaries where new lithosphere is being added along a mid-oceanic ridge are called
- A. divergent boundaries.
 - B. convergent boundaries.
 - C. transvergent boundaries.
 - D. transform boundaries.
23. What best describes the tectonic character of the Cascades of the Pacific northwest?
- A. continental collision zone
 - B. subduction zone
 - C. continental hot spot
 - D. continental rift zone
24. Along which of the following would you not expect to find active volcanism?
- A. hot spot
 - B. ocean spreading ridge
 - C. continental collision zone
 - D. subduction zone
25. When an oceanic and a continental plate converge,
- A. the oceanic plate will be subducted.
 - B. neither subducts.
 - C. the continental plate will be subducted.
 - D. a transform plate boundary forms.
 - E. an oceanic ridge forms.
26. When two continental plates converge,
- A. neither subducts; instead, a mountain range forms.
 - B. a hotspot is formed.
 - C. the younger one subducts.
 - D. the older one subducts.
27. Your job is to locate the world's plate boundaries. To do this, you can use only one map. The best map to choose for this job is a map that shows the worldwide locations of:
- A. ocean trenches
 - B. earthquakes
 - C. hotspots
 - D. coastlines of the continents

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28. Ocean depths are routinely determined by
- A. observing the amount of marine life present.
 - B. sending sound through the water and determining the time required for it to return to the ship.
 - C. diving to the sea floor and recording the pressure.
 - D. determining very accurately the amount of dissolved material in seawater.
29. When measured from a satellite, what occurs to the ocean water over a seamount on the ocean floor?
- A. the ocean water becomes denser due to higher gravitational pull
 - B. it rises up to form a mound based on the mass of the seamount
 - C. it forms a depression based on the mass of the seamount
 - D. the ocean water remains flat as all water should
30. The reason that the mid-ocean ridge has a zigzag appearance is because
- A. it curves around submarine canyons.
 - B. it curves around deep-ocean trenches.
 - C. it accommodates spreading of a linear ridge system on a spherical Earth.
 - D. it cannot intersect any islands in the ocean.

Section Two (40%). Critical Thinking: Please carefully read each question and answer completely (complete sentences and thoughts, capitalization, punctuation, etc.). Compose in your word processor, spell and grammar check.

31. How did the view of the ocean by early Mediterranean cultures influence the naming of the planet "Earth"?
32. List and describe some of the major accomplishments of Captain James Cook.
33. Earth has had three atmospheres (initial, early, and present). Describe the composition and origin of each one.
34. Cite the lines of evidence Alfred Wegener used to support his idea of continental drift. Why did scientists doubt that continents drifted?
35. List and describe the different types of hydrothermal vents.
36. Discuss the development of bathymetric techniques, indicating significant advancements in technology.
37. What are the differences between a submarine canyon and an ocean trench?
38. Describe the major features of a passive continental margin: continental shelf, continental slope, continental rise, submarine canyon, and deep-sea fans.