

G100 Exam #1  
Version A

1. The rates of movement of the plates can all be determined by:
  - A. Seafloor depth
  - B. Global Positioning System
  - C. Seafloor Magnetic Anomalies
  - D. B&C
  - E. None of the above
2. What was the hypothesis for the movement of continents before the development of plate tectonic theory?
  - A. Uniformitarianism
  - B. Seismicity
  - C. Bumper-Car Theory
  - D. Continental Drift
3. Which of these plate boundaries does not exist?
  - A. Continental-Oceanic Transform
  - B. Continental-Continental Divergent
  - C. Continental-Oceanic Divergent
  - D. Oceanic-Oceanic Transform
4. If a mineral has good cleavage, this means that it:
  - A. Is shiny in appearance
  - B. Is very dense
  - C. Breaks along irregular surfaces
  - D. Breaks along planar surfaces
5. Which is not one of the three main categories of rocks?
  - A. Sedimentary
  - B. Igneous
  - C. Asteroidal
  - D. Metamorphic
6. The extrusive equivalent of Granite is:
  - A. Basalt
  - B. Gabbro
  - C. Rhyolite
  - D. Dacite
7. The mantle can partially melt to form magma if the following occurs:
  - A. It rises and pressure is reduced
  - B. It sinks and gets hotter
  - C. Water is added from subducted minerals
  - D. A&C

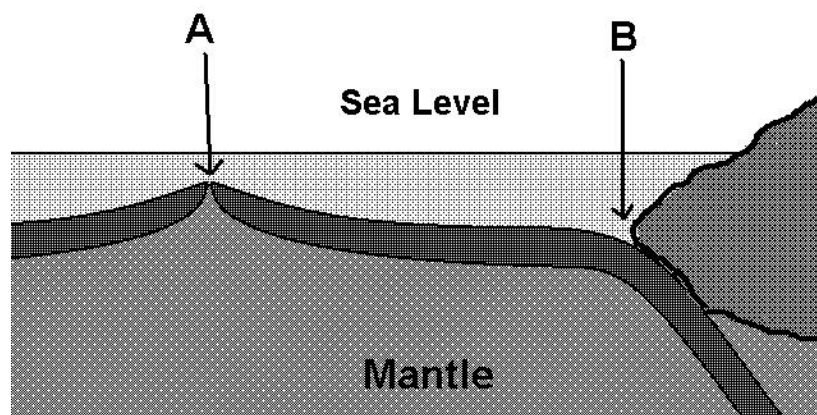
8. The inner and outer cores of Earth are composed of almost entirely of:
- A. Iron
  - B. Nickel
  - C. Mafic rocks
  - D. Silicon
9. The Earth's magnetic field exists because of:
- A. Movement of liquid in the Earth's core
  - B. Movement of liquid in the Earth's mantle
  - C. Movement of liquid in the Earth's crust
  - D. The solar wind
10. In which of the following settings would you NOT expect to find volcanism?
- A. Convergent boundary
  - B. Divergent boundary
  - C. Transcurrent boundary
  - D. Hot spot
11. At which of the following locations does decompression melting occur?
- A. Ocean-ocean convergent boundary
  - B. Mid-ocean ridge
  - C. Continent-continent convergent boundary
  - D. Ocean-continent convergent boundary
12. What is the dominant physical state of the inner core?
- A. Solid
  - B. Liquid
  - C. Gas
  - D. Plasma
13. Intrusive igneous rocks are generally
- A. Fine-grained
  - B. Vesicular
  - C. Coarse-grained
  - D. Glassy
14. Which of the following is NOT a line of evidence supporting the theory of plate tectonics?
- A. Fossils found on multiple continents
  - B. The location of zones of seismic activity
  - C. Shape and location of major seafloor features
  - D. The geothermal gradient

15. True or False: The oldest seafloor occurs along the mid-ocean ridges.
- A. True
  - B. False
16. The intrusive equivalent of basalt is called gabbro.
- A. True
  - B. False
17. Where would you go if you wanted to see two oceanic plates spreading apart?
- A. Wisconsin
  - B. East Africa
  - C. Hawaii
  - D. Iceland
18. The reason an oceanic plate is subducted beneath a continental plate is because:
- A. It is denser than the continental plate.
  - B. It is less dense than the continental plate.
  - C. It is weaker than the continental plate.
  - D. The weight of the ocean pushes it down.
19. When an oceanic plate subducts under a continental plate, where would you expect volcanoes to form?
- A. On the ocean side of the margin
  - B. In the trench formed by the two plates, along the margin
  - C. On the continent side of the margin
  - D. On both the ocean and continent sides
20. What is the driving mechanism for plate tectonics?
- A. Seismic Activity
  - B. Magnetic Reversals
  - C. Mantle Convection
  - D. All of the above
21. The Earth's \_\_\_\_\_ is composed of rocky, rigid plates which move on top of the \_\_\_\_\_.
- A. asthenosphere, lithosphere
  - B. lithosphere, asthenosphere
  - C. mantle, asthenosphere
  - D. lithosphere, core
22. If you found a natural substance with a solid crystal structure and widely variable composition that was inorganically formed, it would be considered a mineral.

- A. True
- B. False

23. What is one benefit humans do not get from volcanoes or igneous rocks?
- A. Geothermal energy
  - B. Oil and natural gas
  - C. Fertile soils
  - D. Mineral deposits

The next two questions refer to the diagram below:



24. What type of plate boundary is represented at point A?
- A. Oceanic-oceanic convergent
  - B. Oceanic divergent
  - C. Oceanic-continental convergent
  - D. Continental divergent
25. What type of plate boundary is represented at point B?
- A. Oceanic-oceanic convergent
  - B. Oceanic divergent
  - C. Oceanic-continental convergent
  - D. Continental divergent
26. Which of the following makes a mineral unique (unlike any other mineral)?

- A. Chemical composition only
- B. Shape, charge, and crystal structure
- C. Chemical composition and crystal structure
- D. Color and Cleavage

27. What do diamond and graphite have in common?

- A. Crystal structure
- B. Method of Formation
- C. Ionic bonding
- D. Chemical formula

28. The rock cycle can be most accurately described by which order of events?

- A. Igneous activity, uplift, weathering and erosion, burial and lithification, metamorphism
- B. Metamorphism, weathering and erosion, igneous activity, uplift
- C. Uplift, metamorphism, burial and lithification, igneous activity
- D. Weathering and erosion, igneous activity, metamorphism, uplift

29. Silicate minerals are based on which of the following anions?

- A.  $S^{2-}$
- B.  $(SiO_4)^{4-}$
- C.  $(CO_3)^{2-}$
- D.  $O^{2-}$

30. Volcanoes fed by felsic magma typically have eruptions that are

- A. Highly viscous and flow long distances
- B. Highly viscous and explosive
- C. Not very viscous and flow long distances
- D. None of the above

31. Mafic rocks have which of the following characteristics

- A. Greater abundance of iron and magnesium
- B. Darker color
- C. Greater abundance of silica
- D. Greater abundance of sodium and potassium
- E. A&B
- F. C&D

32. Subduction zone volcanoes are commonly more explosive not only because they erupt more viscous magma, but also because\_\_\_\_\_.

- A. Mantle plumes are rising beneath them
- B. Water from subducting crust is present in the magma as vapor (gas)
- C. Decompression melting occurs
- D. They occur at high elevations

33. The Pacific Ring of Fire is characterized by:
- A. Subduction zones
  - B. Volcanism
  - C. Earthquakes
  - D. All of the above
34. The zone of plastic rock beneath the lithosphere is called the
- A. Stratosphere
  - B. Thermosphere
  - C. Magnetosphere
  - D. Asthenosphere
35. Which of the following is NOT a renewable source of energy?
- A. Wind
  - B. Solar
  - C. Petroleum
  - D. Geothermal
36. Pyroxene has the following silicate structure:
- A. Isolated tetrahedra
  - B. Single-chain
  - C. Double-chain
  - D. Carbonate
37. Basaltic magma is characterized by:
- A. Low-viscosity
  - B. High viscosity
  - C. Mafic composition
  - D. A&C
38. Mauna Loa on the island of Hawaii is the world's largest
- A. Stratovolcano
  - B. Cinder cone
  - C. Caldera
  - D. Shield volcano
39. Pyroclastic flows result from
- A. Mafic magmas
  - B. Felsic magmas
  - C. Low viscosity magmas
  - D. Pillow basalts
40. A caldera forms when
- A. A magma chamber discharges enough magma that it can no longer support its roof
  - B. A magma chamber comes into contact with a large body of water
  - C. Successive layers of pyroclastic material are deposited
  - D. When the mantle and crust spontaneously invert

41. Which of the following are tabular, sheet-like, intrusive igneous bodies?

- A. Dikes
- B. Sills
- C. Batholiths
- D. A&B

42. According to Bowen's Discontinuous Reaction Series, the first mineral to crystallize out of a mafic melt is:

- A. Amphibole
- B. Olivine
- C. Plagioclase feldspar
- D. Quartz

43. If you start a stopwatch and heat a piece of basalt and a piece of granite from room temperature to 1200° C, the granite will melt first.

- A. True
- B. False

44. Fractional crystallization and metamorphism are both processes that lead to magmatic differentiation.

- A. True
- B. False

45. During fractional crystallization

- A. Lithosphere is melted due to its proximity to a magma body
- B. Crystallization of minerals changes the composition of the magma
- C. A magma becomes less viscous due to the addition of water
- D. B&C

46. Volcanic gasses contribute to the greenhouse effect

- A. True
- B. False

47. Tectonic plates move at a rate of

- A. 1-20 meters per year
- B. 1-200 millimeters per year
- C. 50-100 centimeters
- D. Plate tectonics is a myth

48. Oceanic crust is composed primarily of:

- A. Basalt
- B. Granite
- C. Rhyolite
- D. Quartz

49. Temperature of rocks increases with depth along the geothermal gradient and experiments show that the melting temperature of rocks also increases with depth, thus partial melting of a rock in the mantle requires that:

- A. Heat is added from the core
- B. the rock undergoes a decrease in pressure and rises toward the surface.
- C. iron from the core lowers the melting temperature of the mantle rock.
- D. none of the above

50. Paricutin volcano in Mexico erupted in 1943 and formed a \_\_\_\_\_.

- A. Stratovolcano
- B. Caldera
- C. Cinder Cone
- D. Pyroclastic flow

51. The Yellowstone volcanic track formed because

- A. The North American plate moved over a hot spot.
- B. Continental rift material erupted.
- C. Pyroclastic debris built up above the volcanoes.
- D. A series of composite cones was produced by subduction.

52. When a volcanic eruption mixes with large quantities of water or ice a \_\_\_\_\_ can form.

- A. Lahar
  - a. Large igneous province
  - b. Fissure eruption
  - c. Fumerole