

1. \_\_\_\_\_ are most likely to study the images sent back from Mars.
  - A. Astronomers
  - B. Geologists
  - C. Doctors
  - D. Engineers
2. When did the Earth form?
  - A. About 540 million years ago
  - B. About 2.5 billion years ago
  - C. About 4.6 billion years ago
  - D. About 15 billion years ago
3. Which is the most abundant element in the Earth's core?
  - A. Oxygen
  - B. Silicon
  - C. Iron
  - D. Hydrogen
4. Which of the following processes occur prior to diagenesis?
  - A. Cementation
  - B. Transportation
  - C. Dewatering
  - D. Compaction

Select the right density for each of the following items from the choices below

5. Continental crust
6. Core density
7. Mantle density

A.  $\sim 2.7 \text{ g/cm}^3$

B.  $\sim 5.5 \text{ g/cm}^3$

C.  $\sim 10.0\text{--}13 \text{ g/cm}^3$

D.  $\sim 1.0 \text{ g/cm}^3$

$$E. \sim 3.3 \text{ g/cm}^3$$

8. By weight, which elements are the most abundant in the Earth's crust?
- A. Iron and oxygen
  - B. Oxygen and silicon
  - C. Silicon and iron
  - D. Oxygen and aluminum
9. Earth's lithospheric plates are moved mainly
- A. By the drag of convection forces at the base of the plates
  - B. Because they float on the oceans
  - C. Because they float on Earth's liquid mantle
  - D. Because of "trench-pull" and "ridge-push forces"
10. Which of following statements about Pangaea is false?
- A. It was proposed by Alfred Wegener
  - B. It was the first supercontinent on Earth
  - C. It was a mosaic of plates
  - D. It broke up into the continents as we know them today
11. Which is NOT among the three basic types of plate boundaries?
- A. Divergent boundary
  - B. Convergent boundary
  - C. Oblique boundary
  - D. Transform-fault boundary
12. If a granite outcrop is exposed to highly intensive weathering, which minerals are most likely to be produced as a result.
- A. Pyroxene and Amphiboles
  - B. Micas
  - C. Feldspars
  - D. Quartz and clay
13. What force(s) drive(s) the mechanism of plate tectonics?
- A. Gravity
  - B. Electromagnetism
  - C. Nuclear force
  - D. Solar energy

E. All of the above

14. Which of following statements about asthenosphere is true?

- A. It is rigid layer
- B. It lies below the lithosphere
- C. It lies above the mantle
- D. Its thickness is usually 20km

15. Choose the correct composition and density for the Continental crust :

- A Granite,  $2.7 \text{ g/cm}^3$
- B Peridotite,  $>3 \text{ g/cm}^3$
- C Basalt  $2.8 \text{ g/cm}^3$
- D Gabbro,  $2.8 \text{ g/cm}^3$

16. Choose the correct composition and density for the Mantle

- A Granite ,  $2.7 \text{ g/cm}^3$
- B Peridotite,  $>3 \text{ g/cm}^3$
- C Basalt  $2.8 \text{ g/cm}^3$
- D Diorite  $2.7 \text{ g/cm}^3$
- E Iron  $11.3 \text{ g/cm}^3$

17. The process by which plates separate and oceanic crust is created is called

- \_\_\_\_\_
- A. Seafloor spreading
  - B. Subduction
  - C. Continental drift
  - D. Continental collision
  - E. Transform plate motion

18. Which process is related to convergent plate boundaries?

- A. Water-assisted partial melting
- B. Mountain building
- C. A and B
- D. Creation of oceanic crust
- E. Plate spreading

19. The Red Sea represents a \_\_\_\_\_ plate boundary.

- A. Transform

- B. Divergent
- C. Convergent
- D. None of the above

20. Earthquakes are associated with which of the following types of plate boundaries?

- A. Transform
- B. Divergent
- C. Convergent
- D. All of the above

21. The oldest oceanic rocks are \_\_\_\_\_.

- A. 3.8 billion years old
- B. 540 million years old
- C. 250 million years old
- D. 200 million years old

22. Choose the correct example for each of the following types of plate boundaries

Ocean-continent convergent plate boundary

- A. Andes
- B. Himalaya
- C. Japan
- D. Gulf of Mexico

23. Continent-continent convergent plate boundary

- A. Andes
- B. Himalaya
- C. Japan
- D. Gulf of Mexico

24. Which of following sedimentary rocks contains the finest grains?

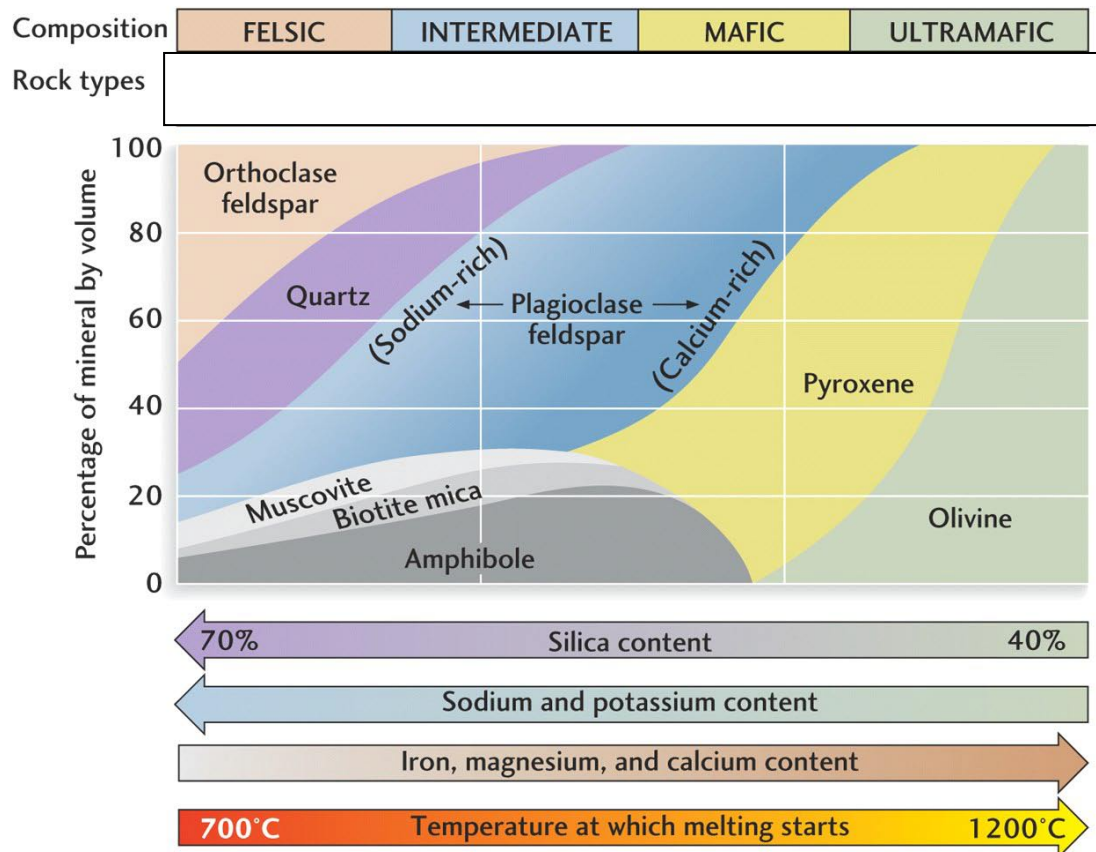
- A. Sandstone
- B. Siltstone
- C. Mudstone
- D. Conglomerate

25. Which of the following is mineral?

- A. Bread
- B. Glass
- C. Salt
- D. Sugar

26.  $(\text{CO}_3)^{2-}$  is a(n)
- A. Anion
  - B. Cation
  - C. Isotope
  - D. Nucleus
27. Which of the following is an accurate statement about the structure of atoms?
- A. Protons move around the nucleus of an atom in a series of orbits, each of which can hold up to eight electrons
  - B. The number of electrons in an atom is equal to the number of protons plus the number of neutrons
  - C. Atoms of most elements can gain or lose electrons from their outer shells to form ions
  - D. The positively charged cation of an element is heavier than the atom of that element, because of the addition of electrons
28. Which of the following statements about the lithosphere is FALSE?
- A. The lithosphere is cool and relatively brittle
  - B. The lithosphere includes the crust and uppermost mantle
  - C. The lithosphere is easily deformed, like a tube of toothpaste
  - D. The lithosphere floats on the asthenosphere
29. What type of chemical bonding holds the Na and Cl atoms together in table salt (NaCl)?
- A. Covalent bonds
  - B. Ionic bonds
  - C. Metallic bonds
  - D. Electrical bonds
30. The hardness of diamond is generally attributable to its
- A. Temperature of formation
  - B. Cleavage
  - C. Bond type
  - D. Atomic weight
31. Which of the following process(es) form(s) new minerals?
- A. Crystallization from a magma

- B. Crystal growth in the solid state
- C. Precipitation from solution
- D. All of the above
- E. Only Erosion and sedimentation



32. What mineral composition is closest to that of Diorite?
- A. 20% feldspars 70% pyroxene 10% olivine
  - B. 50% feldspars 35% quartz 10% micas 5% amphiboles
  - C. 55% Feldspars 15% Quartz 20% Amphibole 10% micas
  - D. 100% olivine
33. Which of the following minerals belongs to the sulfate group of minerals?
- A. Olivine
  - B. Mica
  - C. Gypsum
  - D. Amphibole
34. The following mineral type corresponds to the following ion
- A. True

B. False

Carbonate .....  $(\text{CO}_3)^{2-}$

35. Which of the following minerals has the greatest hardness?

- A. Calcite
- B. Corundum
- C. Quartz
- D. Apatite
- E. Gypsum

36. Mica has excellent cleavage along smooth, flat, and parallel surfaces

- A. True
- B. False

37. Name the following type of igneous intrusion:



- A. sill
- B. batholith

- C. dyke
- D. volcanic neck
- E. cross-stratification

38. Which minerals are the main minerals in granite?

- A. Olivine, pyroxene and amphibole
- B. All below
- C. Quartz and micas
- D. Micas and quartz
- E. Feldspars and quartz

39. Magma is the direct source material for which rock type?

- A. Sedimentary
- B. Igneous
- C. Metamorphic
- D. All of the above

40. In the mantle, magma can start to form aided by which of the following conditions?

- A. Quickly decreasing pressures
- B. Increasing temperatures
- C. Adding water
- D. All of the above

41. Which of the following types of volcanism best explains the Hawaii Island Chain?

- A. Subduction zone volcanism
- B. Mid-ocean ridge volcanism
- C. Ocean-ocean volcanism
- D. Hot spot volcanism

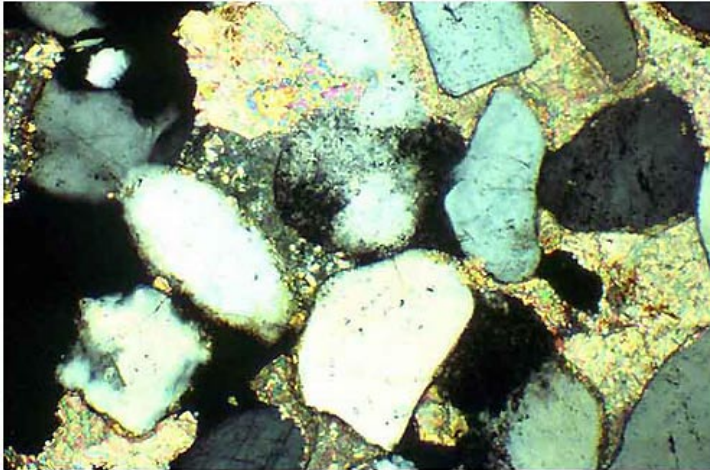
42. Which of the following igneous rocks is the most mafic?

- A. Diorite
- B. Gabbro
- C. Granite



D. Andesite

43. Which of the following sedimentary environments is most likely to produce the angular clasts of sand seen in the image below?



- A. Lake
- B. Delta
- C. Deep ocean
- D. Mountain stream

44. Hardness refers to a mineral's \_\_\_\_\_.

- A) resistance to cleavage
- B) resistance to fracture
- C) resistance to breaking
- D) resistance to scratching

45. What of the following statements about volcanoes is true?

- A. Subduction volcanoes are found in continental crust at divergent plate boundaries
- B. Hot spot volcanoes are only found within oceanic crust
- C. Decompression-melting creates the magma that eventually feeds the volcanoes at divergent plate margins
- D. None of the above

46. In which of the following sedimentary environments are we most likely to find symmetrical ripples?

- A. Rivers
- B. Beaches
- C. Deserts
- D. Tidal inlets

47. Which of the following substances is not a chemical or biochemical sedimentary rock?

- A. Chert
- B. Limestone
- C. Conglomerate
- D. Evaporite

48. In most cases, cross-bedding in sedimentary rocks, indicates the

- A. Direction of water or air that created the cross-bedded sediments
- B. Opposite direction of flow movement that is immediately obvious
- C. No true direction of fluid flow
- D. All of the above are possible

49. Clastic sedimentary rocks can be classified on the basis of their

- A. Chemical composition
- B. Temperature of formation
- C. Pressure of formation
- D. Temperatures of crystallization

50. The degree of sorting in the grains of sand in a sandstone can be used to infer

- A. The velocity of the current that carried the grains
- B. The distance over which the sand was transported
- C. The distance to the source of the grains of sand
- D. That the original rock that was weathered to produce the sand was peridotite

