

## Chapter 02 Rocks and Minerals-A First Look

### Multiple Choice Questions

1. A mineral is
  - A. A naturally occurring, crystalline, solid chemical element or compound with a definite or range of composition.
  - B. Possibly an organic chemical compound.
  - C. Necessarily inorganic.
  - D.** Both a and c provide the correct definition.
  
2. An atom that has 20 protons and 20 neutrons in its nucleus has this atomic number
  - A.** 20.
  - B. 40.
  - C. 400.
  - D. Cannot determine because not enough information is given.
  
3. Atoms of the same element that have different numbers of neutrons are \_\_\_\_\_ of that element.
  - A. Ions
  - B.** Isotopes
  - C. Electrons
  - D. Atomic numbers
  
4. Which of the following physical properties are unreliable and not unique to a particular mineral and so must be used only cautiously when identifying minerals in the absence of scientific instruments?
  - A. Hardness
  - B. Cleavage
  - C. Density
  - D.** Color

5. The internal regular arrangement of ions or atoms in a material makes it

- A. Amorphous.
- B. Non-crystalline.
- C.** Crystalline.
- D. None of the options are correct.

6. Which of the following is not a mineral?

- A. Quartz
- B. Mica
- C. Ice
- D.** Sugar

7. The most common minerals in the crust are

- A. Carbonates.
- B.** Silicates.
- C. Sulfates.
- D. Sulfides.

8. Silicates rich in iron and/or magnesium are termed

- A. Cations.
- B. Feldspars.
- C.** Ferromagnesian.
- D. Magnetite.

9. Which of the following is a silicate mineral?

- A. Galena
- B. Calcite
- C.** Muscovite
- D. Pyrite

10. Expansive clays

- A. Expand when wet, shrink when dried out.
- B. Make a good building foundation because they mold to the structure.
- C. Are economically useful sulfide minerals.
- D. All of the choices are correct.

11. Native elements are those elements that

- A. Do not have more than one isotope.
- B. Are all those found naturally in the earth.
- C. Are common in rocks of the United States.
- D. Occur as minerals consisting of a single element.

12. Which of the following are minerals that comprise a native element

- A. Sulfur.
- B. Diamond.
- C. Graphite.
- D. All of the choices are correct.

13. Which of the following is not a member of the silicate group of minerals?

- A. Quartz
- B. Feldspar
- C. Mica
- D. Diamond

14. Which of the following is a member of the sulfide mineral group?

- A. Calcite
- B. Pyrite
- C. Gypsum
- D. Mica

15. Rocks that crystallize from magma are

- A. Igneous.
- B. Metamorphic.
- C. Sedimentary.
- D. Clastic.

16. Sedimentary rocks include

- A. Pieces of other rocks cemented together (sandstone, shale).
- B. Chemical precipitates (halite, gypsum).
- C. Organically precipitated components cemented together (shells cemented to form limestone).
- D. Organically formed materials compressed together (partially decomposed plant material formed into lignite or coal).
- E. All of the choices are correct.

17. A subgroup of silicates that includes minerals used in ceramics, construction, and drilling for oil is the

- A. Clay subgroup.
- B. Ferromagnesian subgroup.
- C. Mica subgroup.
- D. Zeolite subgroup.

18. Rocks that are formed by the crystallization of new minerals in the solid state (i.e. without melting) due to heat and/or pressure are

- A. Igneous.
- B. Sedimentary.
- C. Ultramafic.
- D. Metamorphic.

19. Magma that is erupted at the earth's surface is

- A. Lava.
- B. Coarse-grained.
- C. Sedimentary.
- D. Granite.

20. Which of the following is an igneous rock?

- A. Salt
- B. Limestone
- C. Granite**
- D. Gneiss

21. Which of the following rock is an example of an extremely rapid rate of cooling?

- A. Granite
- B. Rhyolite
- C. Obsidian**
- D. Basalt

22. Clastic sedimentary rocks are formed

- A. From the broken-up fragments of preexisting rocks.**
- B. From chemicals dissolved in solution.
- C. At very high temperatures because the grains must be fused together to make rock.
- D. All of the choices are correct.

23. The process by which sediments are converted to sedimentary rocks is called

- A. Diagenesis.
- B. Metamorphosis.
- C. Crystallization.
- D. Lithification.**

24. An example of a clastic sedimentary rock is

- A. Limestone.
- B. Gypsum.
- C. Shale.**
- D. Coal.

25. An example of a chemical sedimentary rock is

- A. Sandstone.
- B.** Limestone.
- C. Shale.
- D. Conglomerate.

26. Of the following rocks, one that is metamorphic

- A. Rhyolite.
- B. Olivine basalt.
- C.** Garnet schist.
- D. Granodiorite.

27. The concept of the rock cycle is that

- A. Rocks are moved around the world by geologic processes.
- B.** Rocks are continually undergoing change, being transformed into new rocks.
- C. The world changes, but rocks are permanent.
- D. Rocks must be cycled deep into the crust to be made into different rocks.

28. Which of the following statements about asbestos is true?

- A. Asbestos is a mineral belonging to the carbonate group of minerals.
- B. The type of asbestos most commonly used in construction materials (chrysotile or "white asbestos") is also the most hazardous to health.
- C. Asbestos can occur in any one of the three rocks types, igneous, sedimentary or metamorphic.
- D.** Asbestos is a generic term for any mineral crystal that is a fiber (i.e. thin and flexible).

**True / False Questions**

29. Isotopes are atomic nuclei that are radioactive.

**FALSE**

30. Different isotopes of one element are chemically indistinguishable.

**TRUE**

31. Anions are negatively charged and cations are positively charged.

**TRUE**

32. All crystalline materials show well-developed crystal faces; few naturally occurring mineral samples are crystalline.

**FALSE**

33. The physical properties of a mineral are often closely related to its internal atomic arrangement or crystal structure.

**TRUE**

34. The term cleavage refers to a mineral's tendency to break preferentially in certain directions of the crystal structure.

**TRUE**

35. The basic "building blocks" of the silicate minerals are tetrahedra of silicon and carbon.

**FALSE**

36. Diamond and graphite have the same chemical composition.

**TRUE**

37. Quartz is the most abundant mineral in the crust.

**FALSE**

38. The sulfide mineral group includes many valuable ores.

**TRUE**

39. Plutonic rocks are typically fine grained owing to a faster rate of cooling than volcanic rocks.

**FALSE**

40. Differences in magma composition account for the fact that some volcanoes erupt quietly, others explosively.

**TRUE**

41. The particle grain size conglomerate is greater than that of sandstone.

**TRUE**

42. Metamorphic rocks are formed at extremely high temperatures, above those required to form plutonic rocks.

**FALSE**

43. Chemical sedimentary rocks are those precipitated from a silicate melt.

**FALSE**



Chapter 02 - Rocks and Minerals-A First Look

44. An aphanitic igneous rock is one that has erupted from a volcano and is very fine-grained.

**TRUE**

45. Clastic sedimentary rocks are classified or named on the basis of the size of the fragments that form the rock.

**TRUE**

46. The grain size of an igneous rock is generally related to how quickly the melt cooled: the slower the cooling, the coarser the crystals.

**TRUE**

47. Foliation is a texture that is referred for metamorphic rocks.

**TRUE**

48. Obsidian (volcanic glass) is an example of a clastic rock.

**FALSE**