Minerals and Rocks

1. Which common mineral fizzes when dilute hydrochloric acid (HCl) is placed on it?
   (1) calcite (3) quartz
   (2) feldspar (4) talc

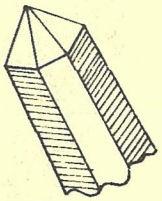
2. Base your answer to the following question on the *Earth Science Reference Tables.*

   Which mineral has a hardness of 6, and shows cleavage?
   (1) Olivine (3) Hematite
   (2) Talc (4) Potassium Feldspar

3. Base your answer to the following question on the *Earth Science Reference Tables.*

   Which of the following elements is not found in Plagioclase Feldspar?
   (1) Na (3) Si
   (2) Al (4) Pb

4. The crystal characteristics of quartz shown in the accompanying diagram are the result of the



   (1) internal arrangement of the elements from which quartz is formed
   (2) shape of the other rock crystals in the area where the quartz was formed
   (3) amount of weathering that the quartz has been exposed to
   (4) age of the quartz crystal

5. Two minerals made of pure carbon are diamond and graphite. Which statement best explains why diamond is so much more resistant to scratching than graphite?
   (1) The atoms are lighter in graphite than in diamond.
   (2) The atoms are heavier in graphite than in diamond.
   (3) The atoms are bonded together more strongly in diamond than in graphite.
   (4) The atoms are smaller in graphite than in diamond.

6. The physical properties of a mineral sample are most closely related to the
   (1) arrangement of the mineral's atoms
   (2) age of the mineral sample
   (3) size of the mineral sample
   (4) temperature of the mineral sample

7. Base your answer to the following question on the *Earth Science Reference Tables.*

   The crust of the Earth is composed chiefly of
   (1) aluminum (3) nitrogen
   (2) silicon (4) oxygen

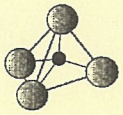
8. Which two elements listed below are most abundant by weight in the Earth's crust?
   (1) silicon and oxygen
   (2) hydrogen and iron
   (3) oxygen and magnesium
   (4) hydrogen and calcium

9. According to the *Earth Science Reference Tables*, which two elements make up the greatest volume of the Earth's crust?
   (1) silicon and potassium
   (2) silicon and iron
   (3) iron and nickel
   (4) oxygen and potassium

10. Which model best represents the silicon-oxygen tetrahedron?

KEY: Oxygen Atom Silicon Atom

(1)



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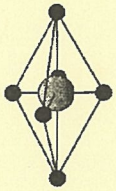

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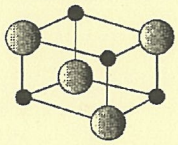

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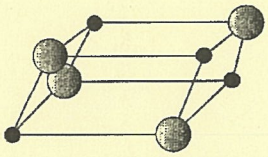
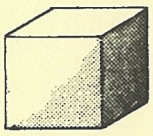


11. Which object is the best model of the shape of a silicon-oxygen structural unit?

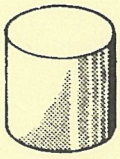
(1)



(3)

(2)

(4)



12. Two mineral samples have different physical properties, but each contains silicate tetrahedrons as its basic structural unit. Which statement about the two mineral samples must be true?
    (1) They have the same density.
    (2) They are similar in appearance.
    (3) They contain silicon and oxygen.
    (4) They are the same mineral.

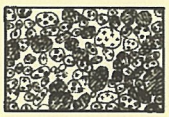
13. The diagrams below represent magnifications of rocks. Which is most likely a diagram of a nonsedimentary rock?

KEY

Quartz Hornblende Feldspar



(1)



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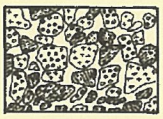

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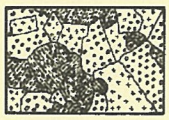
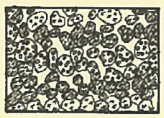


(4)

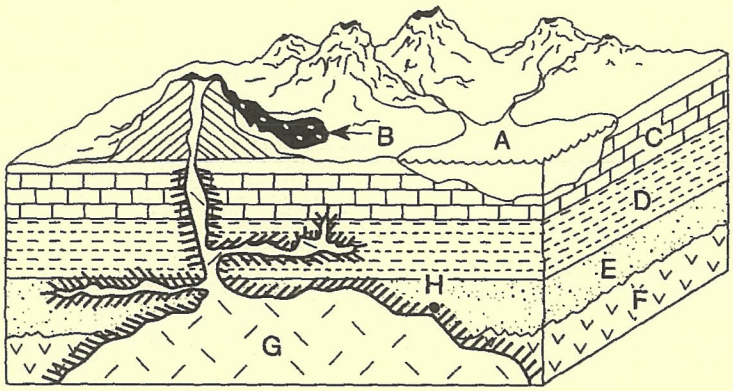


14. What is the main difference between metamorphic rocks and most other rocks?
    (1) Many metamorphic rocks contain only one mineral.
    (2) Many metamorphic rocks have an organic composition.
    (3) Many metamorphic rocks exhibit banding and distortion of structure.
    (4) Many metamorphic rocks contain a high amount of oxygen-silicon tetrahedra.

15. A rock is composed of several large, rounded pebbles and sand grains cemented together. Which inference about the rock is best supported by this description?

(1) The rock is older than the pebbles.
(2) The rock is igneous.
(3) The rock is sedimentary.
(4) The rock resulted from evaporation of sea water.

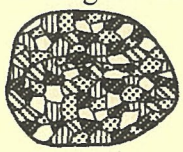
16. Base your answer on the *Earth Science Reference Tables* and the block diagram below. The diagram shows a cross section of Earth's crust. Letter *A* identifies a lake, and letters *B* through *G* represent different types of bedrock.

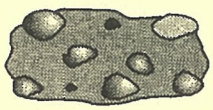


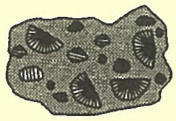
Key:

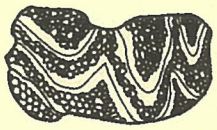
Limestone C
Shale D
Fine-grain sandstone E
Contact metamorphism
Intrusive igneous rock F
Intrusive igneous rock G
Lava flow B

Which diagram best represents a sample of rock *G*?

(1) 

(2) 

(3) 

(4) 

17. The diagram below shows four rock samples.

Sample A Sample B Sample C Sample D

Which sample best shows the physical properties normally associated with regional metamorphism?
(1) *A* (2) *B* (3) *C* (4) *D*

18. Which type of rock is likely to show ripple marks and fossils?
(1) intrusive igneous (3) metamorphic
(2) extrusive igneous (4) sedimentary

19. A coarse-grained rock contains 50% plagioclase, 45% pyroxene, and 5% hornblende. According to the *Earth Science Reference Tables*, this rock should be identified as
(1) basalt (3) rhyolite
(2) granite (4) gabbro

20. According to the *Earth Science Reference Tables*, which metamorphic rock will have visible mica crystals and a foliated texture?
(1) marble (3) schist
(2) quartzite (4) slate

21. According to the *Earth Science Reference Tables,* a sedimentary rock formed as the result of compaction and cementation of uniformly sized fine sediments with a diameter of 0.1 cm is called
(1) conglomerate (3) shale
(2) sandstone (4) siltstone

22. Base your answer to the following question on the *Earth Science Reference Tables*.

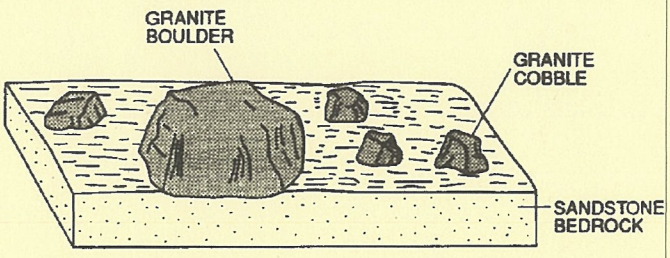
A fine-grained igneous rock contains 11% plagioclase, 72% pyroxene, 15% olivine, and 2% amphibole. This rock would most likely be classified as
(1) granite (3) gabbro
(2) rhyolite (4) basalt

23. How do the metamorphic rocks schist and quartzite differ?
(1) Quartzite contains the mineral quartz and schist does not.
(2) Quartzite forms from regional metamorphism and schist does not.
(3) Schist is organically formed and quartzite is not.
(4) Schist is foliated and quartzite is not.

24. Base your answer to the following question on the *Earth Science Reference Tables*.

Which land-derived sedimentary rock could have formed by the compaction and cementation of particles smaller than 0.0003 centimeter in diameter?
(1) shale (3) sandstone
(2) siltstone (4) limestone

25. Base your answer on the *Earth Science Reference Tables* and the diagram below. The diagram shows a surface and cross-sectional view of a portion of the Earth 15 kilometers from a mountain range.

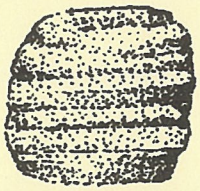


Which characteristic of the granite boulder would furnish the greatest amount of information about the environment in which the granite solidified?

(1) texture
(2) density
(3) hardness
(4) color

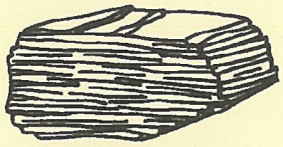
26. The diagrams below represent four rock samples. Which rock took the longest time to solidify from magma deep within the Earth?

(1)



Bands of alternating light and dark minerals

(2)

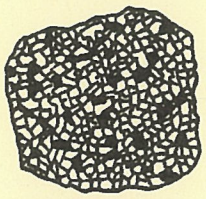


Easily split layers of 0.0001-cm-diameter particles cemented together

(3)

Glassy black rock that breaks with a shell-shape fracture

(4)

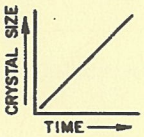


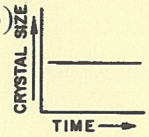
Interlocking 0.5-cm-diameter crystals of various colors

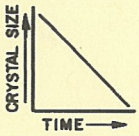
27. The crystals of many metamorphic rocks are aligned in bands as a result of

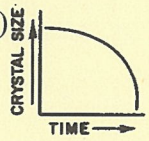
(1) earthquake faulting
(2) cooling and solidification
(3) mechanical weathering
(4) heat and pressure

28. Which graph best shows the relationship between the size of the crystals in an igneous rock and the length of time it has taken the rock to solidify?

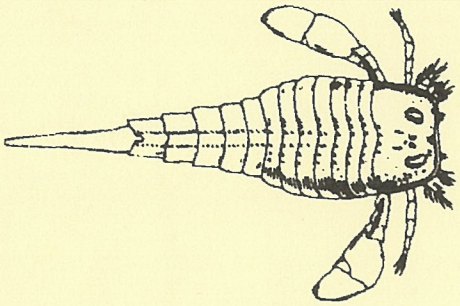
(1) 

(3) 

(2) 

(4) 

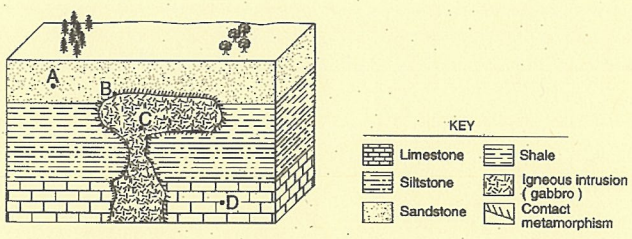
29. Base your answer on the *Earth Science Reference Tables* and the index fossil diagram below. This index fossil was found in surface bedrock in New York State.



The surface bedrock in which this index fossil was found is most likely composed of

(1) basalt
(2) granite
(3) limestone
(4) anthracite coal

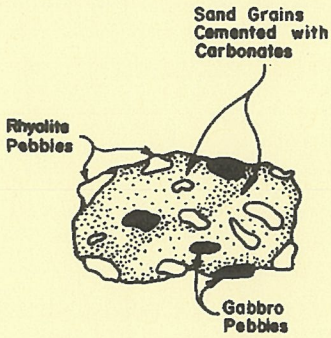
30. Base your answer on the *Earth Science Reference Tables* and the diagram below. The diagram represents a cross section of a portion of the Earth's crust. Points *A* through *D* represent locations in the bedrock. The rock layers have not been overturned.



Which rock formed as a result of heat and pressure at point *B*?

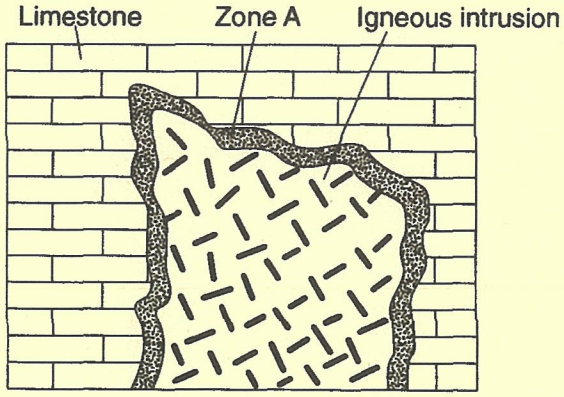
(1) slate
(2) quartzite
(3) marble
(4) anthracite coal

31. Why is the conglomerate rock shown below good evidence that rocks form from other rocks?



(1) The conglomerate contains some nonsedimentary rock fragments.
(2) The conglomerate was formed from material that was buried deep underground.
(3) The conglomerate's pebbles are all weathering at the same rate.
(4) The conglomerate was formed by the cooling of molten rock material.

32. The geologic cross section below shows limestone that was intruded. Part of the limestone (zone A) was heated intensely but was not melted.



Which type of rock most likely formed in zone *A*?

(1) gneiss
(2) slate
(3) marble
(4) obsidian

33. Base your answer to the following question on the *Earth Science Reference Tables.*

Which processes result in the formation of sedimentary rocks?

(1) pressure changes and metamorphism
(2) burial and cementation
(3) melting and solidification
(4) foliation and recrystallization

34. Which statement is supported by information in the Rock Cycle diagram in the *Earth Science Reference Tables*?

(1) Metamorphic rock results directly from melting and crystallization.
(2) Sedimentary rock can only be formed from igneous rock.
(3) Igneous rock always results from melting and solidification.
(4) All sediments turn directly into sedimentary rock.

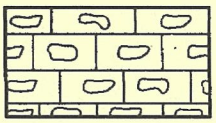
35. According to the Rock Cycle diagram in the *Earth Science Reference Tables*, which type(s) of rock can be the source of deposited sediments?

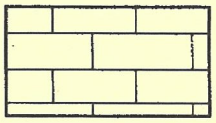
(1) igneous and metamorphic rocks, only
(2) metamorphic and sedimentary rocks, only
(3) sedimentary rocks, only
(4) igneous, metamorphic, and sedimentary rocks

36. Most metamorphic rocks are formed when

(1) sediments are cemented and compacted
(2) magma cools slowly, deep underground
(3) flows of lava cool rapidly
(4) rocks are subjected to heat and pressure

37. Which map symbol is used in the *Earth Science Reference Tables* to represent an organically formed sedimentary rock composed mostly of carbon?

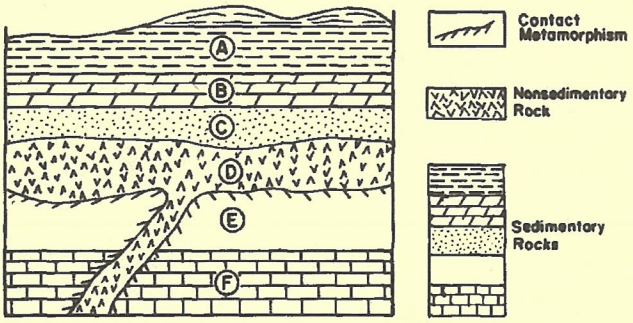
(1) 

(3) 

(2) 

(4) 

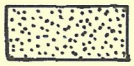
38. Base your answer on your knowledge of Earth science and the diagram below. The diagram represents a geologic cross section consisting of various sedimentary and nonsedimentary rocks which have not been overturned.

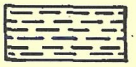


Rock layer *E* is composed of nonuniform particle sizes ranging in diameter from 0.9 to 2.3 centimeters. According to the *Earth Science Reference Tables*, this rock layer should be represented by which symbol?

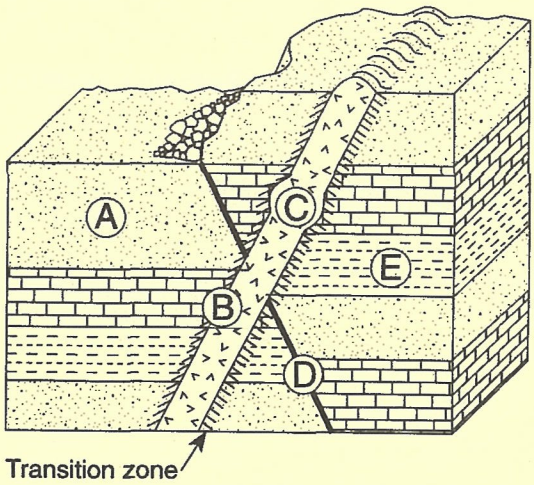
(1) 

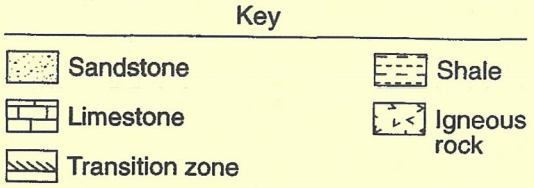
(3) 

(2) 

(4) 

39. Base your answer on geologic cross section shown below.





At which location is metamorphic rock most likely to be found?

(1) *A*
(2) *B*
(3) *C*
(4) *D*