Rocks and Minerals Multiple Choice

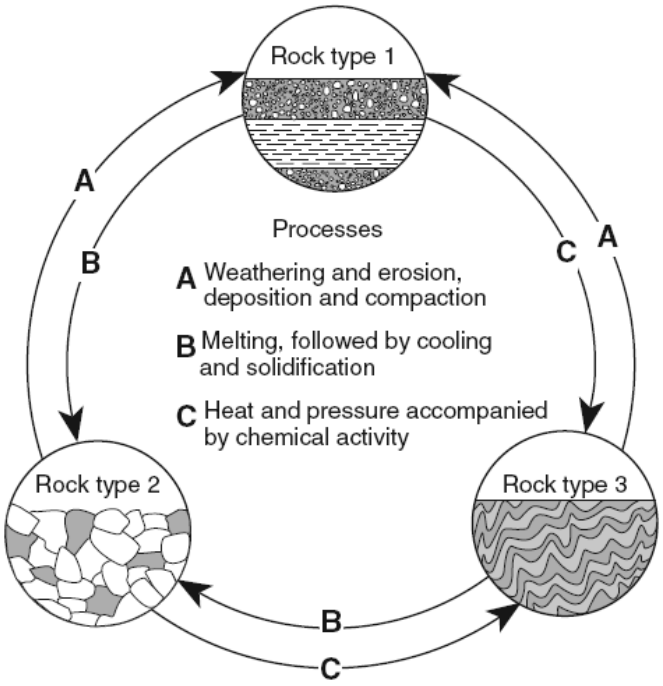
1. The basaltic bedrock of the oceanic crust is classified as

(1) felsic, with a density of 2.7 g/cm3
(2) felsic, with a density of 3.0 g/cm3
(3) mafic, with a density of 2.7 g/cm3
(4) mafic, with a density of 3.0 g/cm3

2. Which property is most useful in distinguishing pyroxene from amphibole?

(1) sample size (3) type of luster
(2) hardness (4) angles of cleavage

The diagram below represents geological processes that act continuously on Earth to form different rock types.



3. Which table correctly classifies each rock type?

Rock Type	Classification
1	sedimentary
2	metamorphic
3	igneous

(1)

Rock Type	Classification
1	metamorphic
2	igneous
3	sedimentary

(3)

Rock Type	Classification
1	sedimentary
2	igneous
3	metamorphic

(2)

Rock Type	Classification
1	igneous
2	metamorphic
3	sedimentary

(4)

The table below shows some properties of four different minerals.

Mineral Variety	Color	Hardness	Luster	Composition
flint	black	7	nonmetallic	SiO_2
chert	gray, brown, or yellow	7	nonmetallic	SiO_2
jasper	red	7	nonmetallic	SiO_2
chalcedony	white or light color	7	nonmetallic	SiO_2

?

4. The minerals listed in the table are varieties of which mineral?

(1) garnet
(2) magnetite
(3) quartz
(4) olivine

?

5. An igneous rock contains 10 grams of radioactive potassium-40 and a total of 10 grams of its decay products. During which geologic time interval was this rock most likely formed?

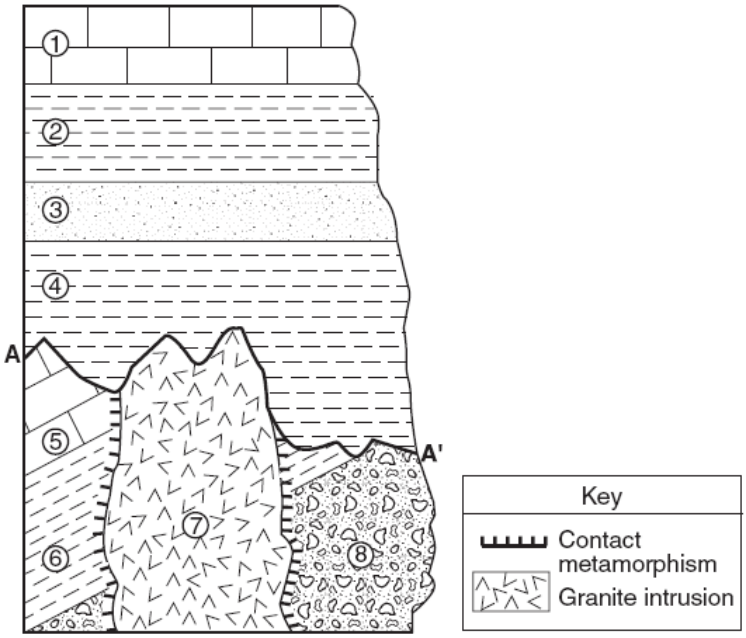
(1) Middle Archean
(2) Late Archean
(3) Middle Proterozoic
(4) Late Proterozoic

6. Dolostone is classified as which type of rock?

(1) land-derived sedimentary rock
(2) chemically formed sedimentary rock
(3) foliated metamorphic rock
(4) nonfoliated metamorphic rock

?

Base your answers to questions 7 through 9 on the cross section below. Rock units are labeled 1 through 8. The line between *A* and *A* indicates an unconformity.



?

7. Which characteristic of the granite intrusion provides the most evidence that it solidified deep underground?

(1) very hard
(2) coarse texture
(3) light color
(4) felsic composition

?

8. Which event occurred sometime after the formation of the unconformity?

(1) formation of rock unit 3
(2) tilting of rock unit 5
(3) deposition of the sediments that formed rock unit 8
(4) intrusion of rock unit 7

?

9. Which rock most probably formed in the contact metamorphic zone within rock unit 6?

(1) marble
(2) basalt
(3) quartzite
(4) hornfels

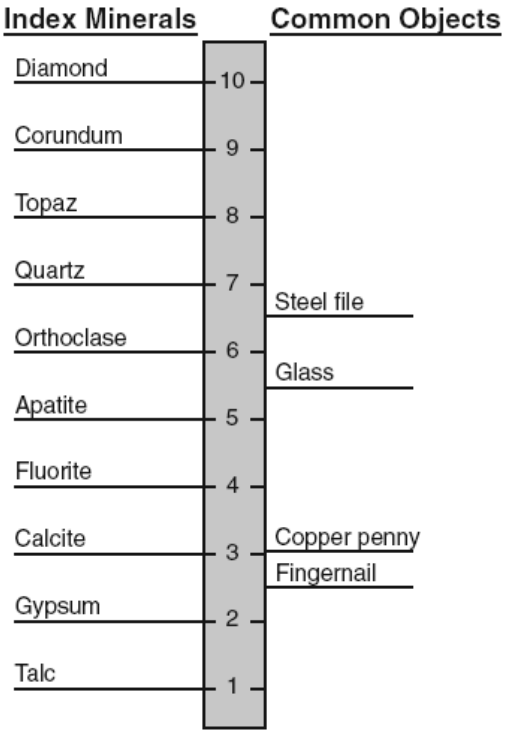
10. Which processes formed the granite that is mined in Vermont?

(1) compaction and cementation of sediments
(2) cooling and solidification of magma
(3) uplift and weathering of bedrock
(4) application of heat and pressure to shale

11. Some of the bedrock in the Green Mountains is actually green in color because of the presence of the mineral chlorite. Which other mineral can cause rocks to appear green?

(1) sulfur
(2) magnetite
(3) olivine
(4) halite

The diagram below shows the index minerals of Mohs hardness scale compared with the hardness of some common objects.



12. Which mineral has a metallic luster, a black streak, and is an ore of iron?

(1) galena
(2) magnetite
(3) pyroxene
(4) graphite

13. Which statement is best supported by the diagram?

(1) A fingernail will scratch calcite but not gypsum.
(2) Calcite will be scratched by a copper penny.
(3) The mineral apatite will scratch topaz.
(4) A steel file has a hardness of about 7.5.

The data table below shows the density of four different mineral samples.

Data Table

Mineral	Density (g/cm^3)
corundum	4.0
galena	7.6
hematite	5.3
quartz	2.7

?

14. A student accurately measured the mass of a sample of one of the four minerals to be 294.4 grams and its volume to be 73.6 cm_3. Which mineral sample did the student measure?

(1) corundum
(2) galena
(3) hematite
(4) quartz

The photograph below shows an igneous rock.

17. What is the origin and rate of formation of this rock?

?

(1) plutonic with slow cooling
(2) plutonic with rapid cooling
(3) volcanic with slow cooling
(4) volcanic with rapid cooling

?

16. Which rock is sedimentary in origin and formed as a result of chemical processes?

(1) granite
(2) shale
(3) breccia
(4) dolostone

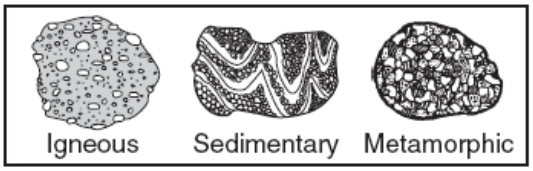
?

18. Which igneous rock has a vesicular texture and contains the minerals potassium feldspar and quartz?

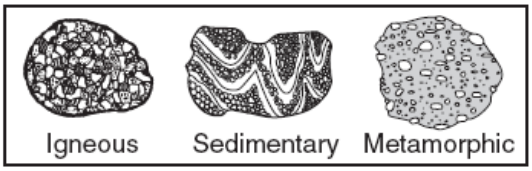
(1) andesite
(2) pegmatite
(3) pumice
(4) scoria

?

19. In which set are the rock drawings labeled with their correct rock types?



(1)



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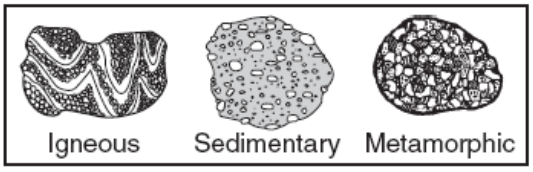

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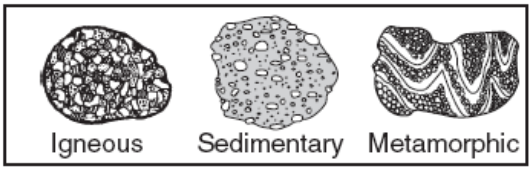
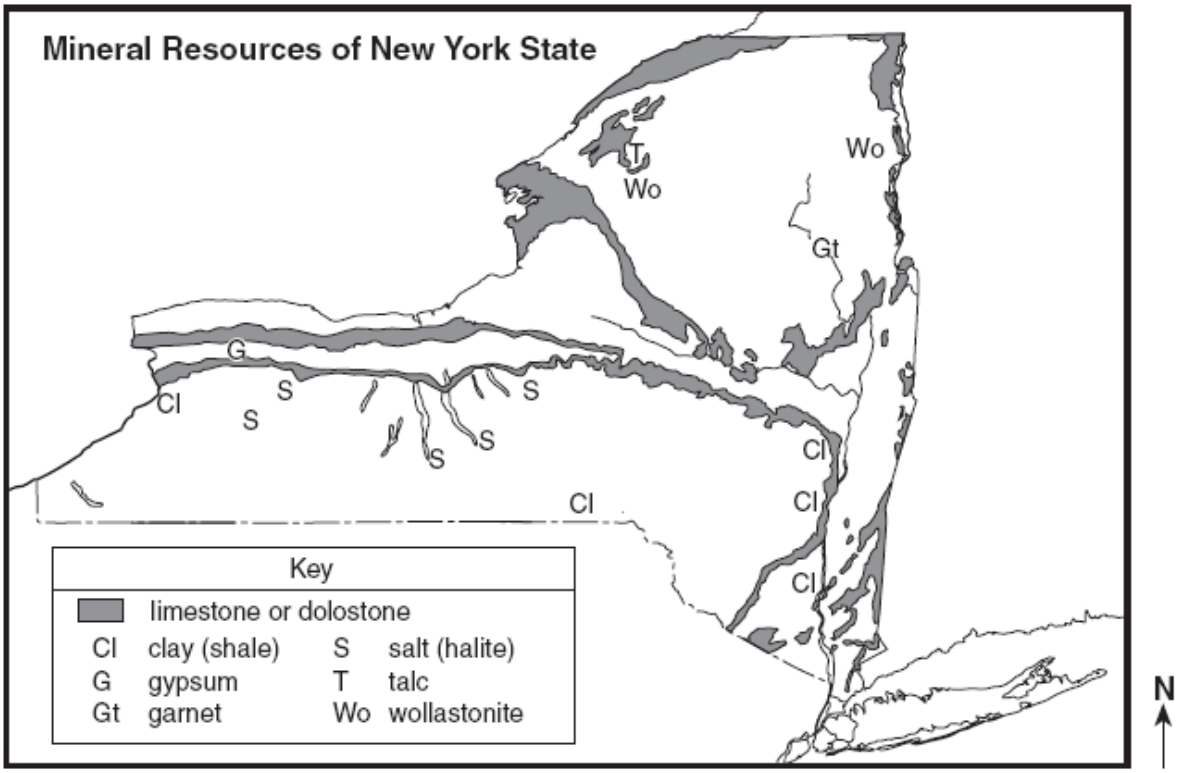


(4)

Base your answers to questions 20 through 23 on the map below, which shows areas where certain minerals were mined in significant amounts during 1989.



20. In which New York State landscape region was most of the garnet mined?

(1) Catskills
(2) Adirondack Mountains
(3) Tug Hill Plateau
(4) Erie-Ontario Lowlands

21. What is a common use for the mineral that is mined at the southern end of the two largest Finger Lakes?

(1) making talcum powder
(2) vulcanizing rubber
(3) polishing jewelry
(4) melting ice

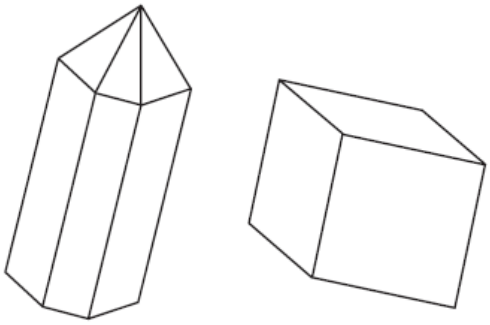
22. The gypsum deposits in New York State were formed

(1) as a result of volcanic eruptions
(2) as a result of metamorphism
(3) in a shallow ocean
(4) in a glacial outwash plain

23. The mineral wollastonite has a hardness of 4.5 to 5. Which New York State mineral could easily scratch wollastonite?

(1) garnet
(2) halite
(3) talc
(4) gypsum

The diagrams below show the crystal shapes of two minerals.



Quartz Halite

?

24. Quartz and halite have different crystal shapes primarily because

(1) light reflects from crystal surfaces
(2) energy is released during crystallization
(3) of impurities that produce surface variations
(4) of the internal arrangement of the atoms

?

25. Which two minerals have cleavage planes at right angles?

(1) biotite mica and muscovite mica
(2) sulfur and amphibole
(3) quartz and calcite
(4) halite and pyroxene

A student created the table below by classifying six minerals into two groups, *A* and *B*, based on a single property.

Group A	Group B
olivine	pyrite
garnet	galena
calcite	graphite

?

26. Which property was used to classify these minerals?

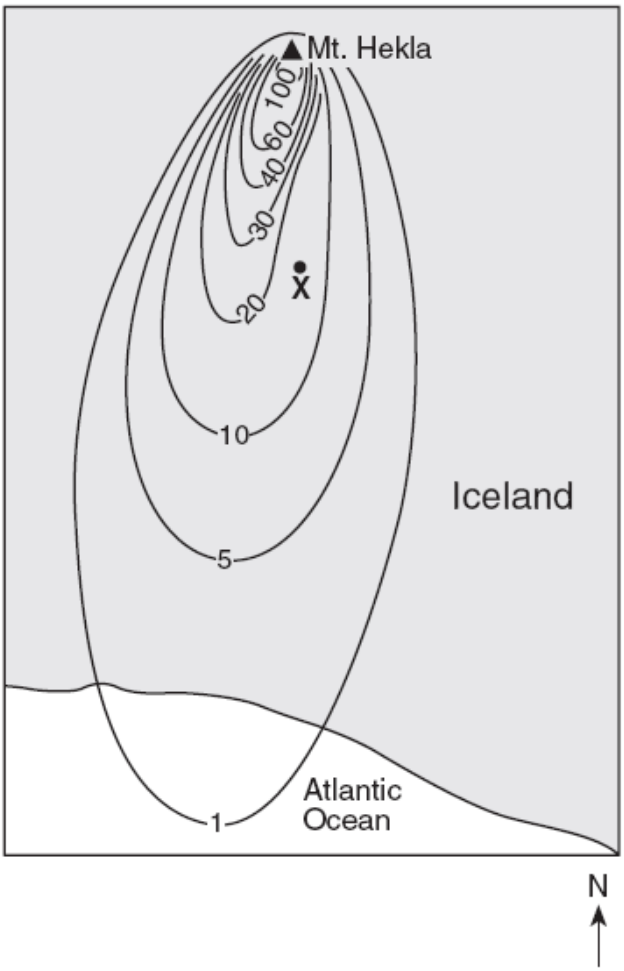
(1) color
(2) luster
(3) chemical composition
(4) hardness

?

27. Which processes most likely formed the shale bedrock found near Ithaca, New York?

(1) uplift and solidification
(2) burial and compaction
(3) heat and pressure
(4) melting and recrystallization

Base your answers to questions 28 through 30 on the map below. The _ represents Mt. Hekla, a volcano in Iceland. The isolines represent the thickness of ash, in centimeters, that settled on Earth's surface after a volcanic eruption of Mt. Hekla on March 29, 1947. Point *X* is a location on the surface of the ash.



28. At the time of the eruption, the wind direction was primarily from the

(1) east
(2) west
(3) north
(4) south

29. How many centimeters thick was the ash beneath point *X*?

(1) 0
(2) 15
(3) 20
(4) 25

30. In addition to the ash, solid rock formed on Mt. Hekla from the lava extruded during this eruption. This rock is most likely

(1) light-colored metamorphic
(2) dark-colored metamorphic
(3) fine-grained igneous
(4) coarse-grained igneous

?

31. Wavy bands of light and dark minerals visible in gneiss bedrock probably formed from the

(1) cementing together of individual mineral grains
(2) cooling and crystallization of magma
(3) evaporation of an ancient ocean
(4) heat and pressure during metamorphism

?

33. A student obtains a cup of quartz sand from a beach. A saltwater solution is poured into the sand and allowed to evaporate. The mineral residue from the saltwater solution cements the sand grains together, forming a material that is most similar in origin to

(1) an extrusive igneous rock
(2) an intrusive igneous rock
(3) a clastic sedimentary rock
(4) a foliated metamorphic rock

The table below shows the hardness of four common materials.

Hardness of Four Materials

Material	Hardness
human fingernail	2.5
copper penny	3.0
window glass	4.5
steel nail	6.5

?

32. Which statement best describes the hardness of the mineral dolomite?

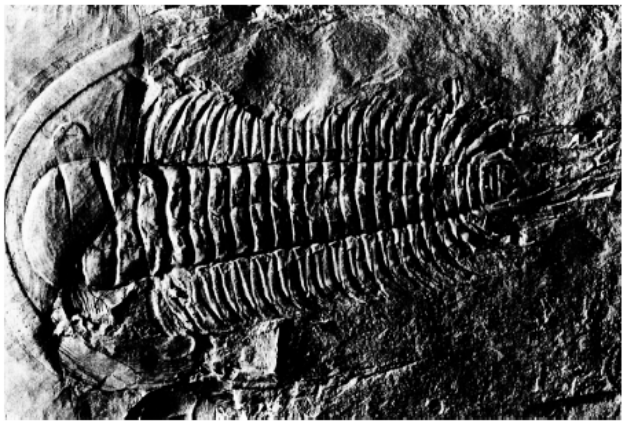
(1) Dolomite can scratch window glass, but cannot be scratched by a fingernail.

(2) Dolomite can scratch window glass, but cannot be scratched by a steel nail.

(3) Dolomite can scratch a copper penny, but cannot be scratched by a fingernail.

(4) Dolomite can scratch a copper penny, but cannot be scratched by a steel nail.

The fossil below was found in surface bedrock in the eastern United States.

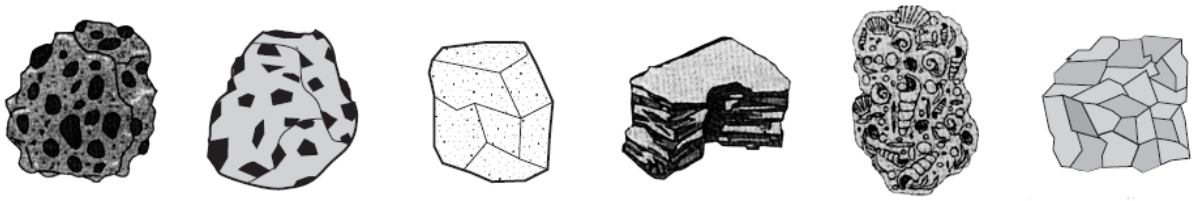


?

34. Which statement best describes the formation of the rock containing this fossil?

(1) The rock was formed by the metamorphism of sedimentary rock deposited in a terrestrial environment during the Cretaceous Period.
(2) The rock was formed by the compaction and cementation of sediments deposited in a terrestrial environment during the Triassic Period.
(3) The rock was formed by the compaction and cementation of sediments deposited in a marine environment during the Cambrian Period.
(4) The rock was formed from the solidification of magma in a marine environment during the Triassic Period.

Base your answers to questions 35 through 37 on the drawings of six sedimentary rocks labeled *A* through *F*.



A Conglomerate | **B** Breccia | **C** Sandstone | **D** Shale | **E** Limestone | **F** Rock salt

35. Most of the rocks shown were formed by

(1) volcanic eruptions and crystallization
(2) compaction and/or cementation
(3) heat and pressure
(4) melting and/or solidification

36. Which two rocks are composed primarily of quartz, feldspar, and clay minerals?

(1) rock salt and conglomerate
(2) rock salt and breccias
(3) sandstone and shale
(4) sandstone and limestone

37. Which table shows the rocks correctly classified by texture?

Texture	clastic	bioclastic	crystalline
Rock	A, B, C, D	E	F

(1)

Texture	clastic	bioclastic	crystalline
Rock	A, C	B, E	D, F

(3)

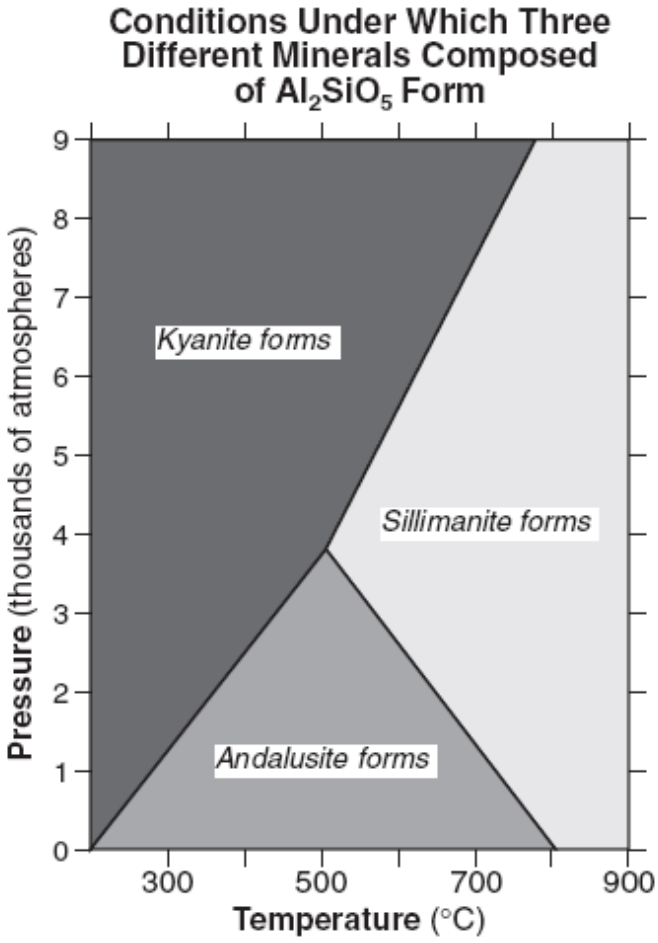
Texture	clastic	bioclastic	crystalline
Rock	A, B, C	D	E, F

(2)

Texture	clastic	bioclastic	crystalline
Rock	A, B, F	E	C, D

(4)

Base your answers to questions 38 through 40 on the graph below, which shows the crustal temperature and pressure conditions under which three different minerals with the same chemical composition (Al_2SiO_5) crystallize.



?

38. Under which crustal temperature and pressure conditions will andalusite form?

(1) 300°C and 6000 atmospheres
(2) 500°C and 2000 atmospheres
(3) 600°C and 4000 atmospheres
(4) 700°C and 8000 atmospheres

?

39. Which mineral has a chemical composition most similar to andalusite, sillimanite, and kyanite?

(1) pyrite
(2) gypsum
(3) dolomite
(4) potassium feldspar

?

40. If bedrock at a collisional plate boundary contains andalusite crystals, these crystals are changed into sillimanite and/or kyanite as temperature and pressure conditions increase. What is this process called?

(1) weathering
(2) solidification
(3) metamorphism
(4) cementation

?

41. Most New York State sandstone bedrock was formed

(1) in Earth's interior where temperatures exceeded the melting point of quartz

(2) on Earth's surface from the cooling of molten lava

(3) in a delta from sand grains deposited, buried, and cemented together by minerals

(4) in a desert when heat and metamorphic pressure caused quartz crystals to fuse together

?

42. Most rock gypsum is formed by the

(1) heating of previously existing foliated bedrock
(2) cooling and solidification of lava
(3) compaction and cementation of shells and skeletal remains
(4) chemical precipitation of minerals from seawater

?

43. The three statements below are observations of the same rock sample:

• The rock has intergrown crystals from 2 to 3 millimeters in diameter.
• The minerals in the rock are gray feldspar, green olivine, green pyroxene, and black amphibole.
• There are no visible gas pockets in the rock.

This rock sample is most likely

(1) sandstone (3) granite
(2) gabbro (4) phyllite

?

44. Which home-building material is made mostly from the mineral gypsum?

(1) plastic pipes (3) drywall panels
(2) window glass (4) iron nails

Base your answers to questions 42 through 46 on the two tables below and on your knowledge of Earth science. Table 1 shows the composition, hardness, and average density of four minerals often used as gemstones. Table 2 lists the minerals in Moh's Scale of Hardness from 1 (softest) to 10 (hardest).

Table 1

Gemstone Mineral	Composition	Hardness	Average Density (g/cm^3)
emerald	$Be_3Al_2(Si_6O_{18})$	7.5–8	2.7
sapphire	Al_2O_3	9	4.0
spinel	$MgAl_2O_4$	8	3.8
zircon	$ZrSiO_4$	7.5	4.7

KEY	
Al = aluminum	O = oxygen
Be = beryllium	Si = silicon
Mg = magnesium	Zr = zirconium

Table 2

Moh's Scale of Hardness
1 talc
2 gypsum
3 calcite
4 fluorite
5 apatite
6 feldspar
7 quartz
8 topaz
9 corundum
10 diamond

?

42 Part of a gemstone's value is based on the way the gemstone shines in reflected light. The way a mineral reflects light is described as the mineral's

(1) fracture (3) luster
(2) hardness (4) streak

?

43 Sapphire is a gemstone variety of which mineral on Moh's scale of hardness?

(1) corundum (3) fluorite
(2) diamond (4) topaz

?

44 If the mass of a spinel crystal is 9.5 grams, what is the volume of this spinel crystal?

(1) 0.4 cm^3 (3) 5.7 cm^3
(2) 2.5 cm^3 (4) 36.1 cm^3

?

45 The hardness and density of each gemstone is based primarily on the gemstone's

(1) internal arrangement of atoms (3) oxygen content
(2) geologic time of formation (4) natural abundance

?

46 Which gemstone minerals contain the two most abundant elements by mass in Earth's crust?

(1) emerald and spinel (3) sapphire and spinel
(2) emerald and zircon (4) sapphire and zircon

The table below shows some observed physical properties of a mineral.

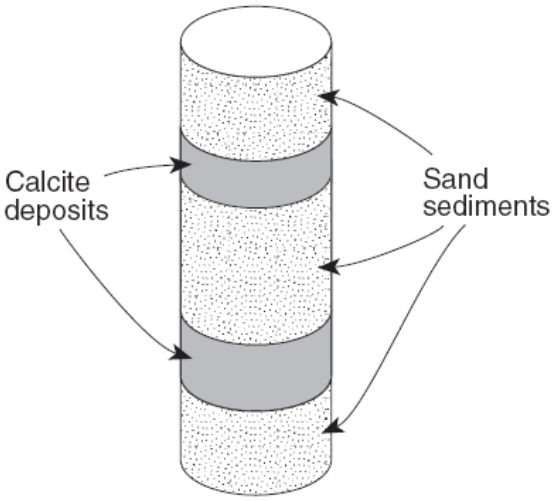
Physical Property	Observation
color	white
hardness	scratched by the mineral calcite
distinguishing characteristic	feels greasy
cleavage/fracture	shows some definite flat surfaces

?

47 Based on these observations, the elements that make up this mineral's composition are

(1) sulfur and lead
(2) sulfur, oxygen, and hydrogen
(3) oxygen, silicon, hydrogen, and magnesium
(4) oxygen, silicon, aluminum, and iron

The diagram below shows a drill core of sediment that was taken from the bottom of a lake.



48 Which types of rock would most likely form from compaction and cementation of these sediments?

(1) sandstone and limestone
(2) shale and coal
(3) breccia and rock salt
(4) conglomerate and siltstone

49 Which intrusive igneous rock could be composed of approximately 60% pyroxene, 25% plagioclase feldspar, 10% olivine, and 5% amphibole?

(1) granite (3) gabbro
(2) rhyolite (4) basalt

50 Which igneous rock, when weathered, could produce sediment composed of the minerals potassium feldspar, quartz, and amphibole?

(1) gabbro (3) andesite
(2) granite (4) basalt

51 How are the minerals biotite mica and muscovite mica different?

(1) Biotite mica is colorless, but muscovite mica is not.
(2) Biotite mica contains iron and/or magnesium, but muscovite mica does not.
(3) Muscovite mica scratches quartz, but biotite mica does not.
(4) Muscovite mica cleaves into thin sheets, but biotite mica does not.

52 Which process could lead directly to the formation of pumice rock?

(1) precipitation of minerals from evaporating seawater
(2) metamorphism of unmelted rock material
(3) deposition of quartz sand
(4) explosive eruption of lava from a volcano

53 A human fingernail has a hardness of approximately 2.5. Which two minerals are *softer* than a human fingernail?

(1) calcite and halite
(2) sulfur and fluorite
(3) graphite and talc
(4) pyrite and magnetite

The rock shown below has a foliated texture and contains the minerals amphibole, quartz, and feldspar arranged in coarse-grained bands.

54 Which rock is shown?

(1) slate (3) gneiss
(2) dunite (4) quartzite

58 Which physical characteristic best describes the rock phyllite?

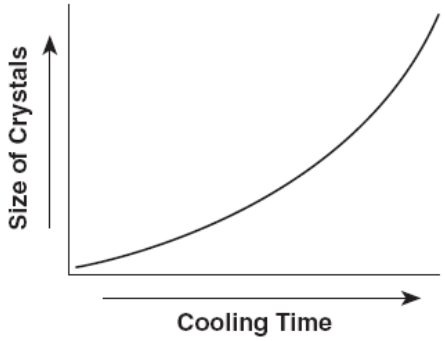
(1) glassy texture with gas pockets
(2) clastic texture with angular fragments
(3) bioclastic texture with cemented shell fragments
(4) foliated texture with microscopic mica crystals

Base your answers to questions 56 and 57 on the photograph below. The photograph shows several broken samples of the same colorless mineral.

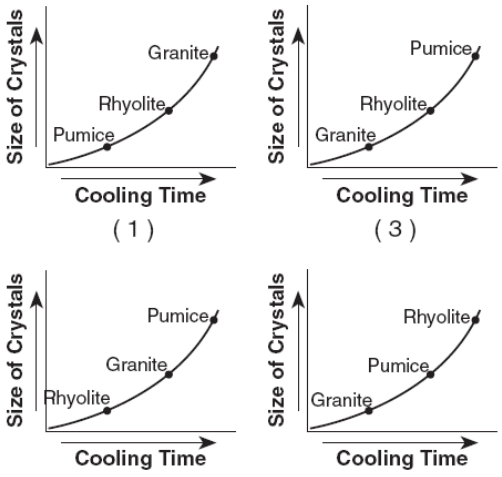
56 Which physical property of this mineral is most easily seen in the photograph?
(1) fracture (3) streak
(2) hardness (4) cleavage

57 Which mineral is most likely shown in the photograph?
(1) quartz (3) galena
(2) calcite (4) halite

The graph below shows the relationship between the cooling time of magma and the size of the crystals produced.



59 Which graph correctly shows the relative positions of the igneous rocks granite, rhyolite, and pumice?



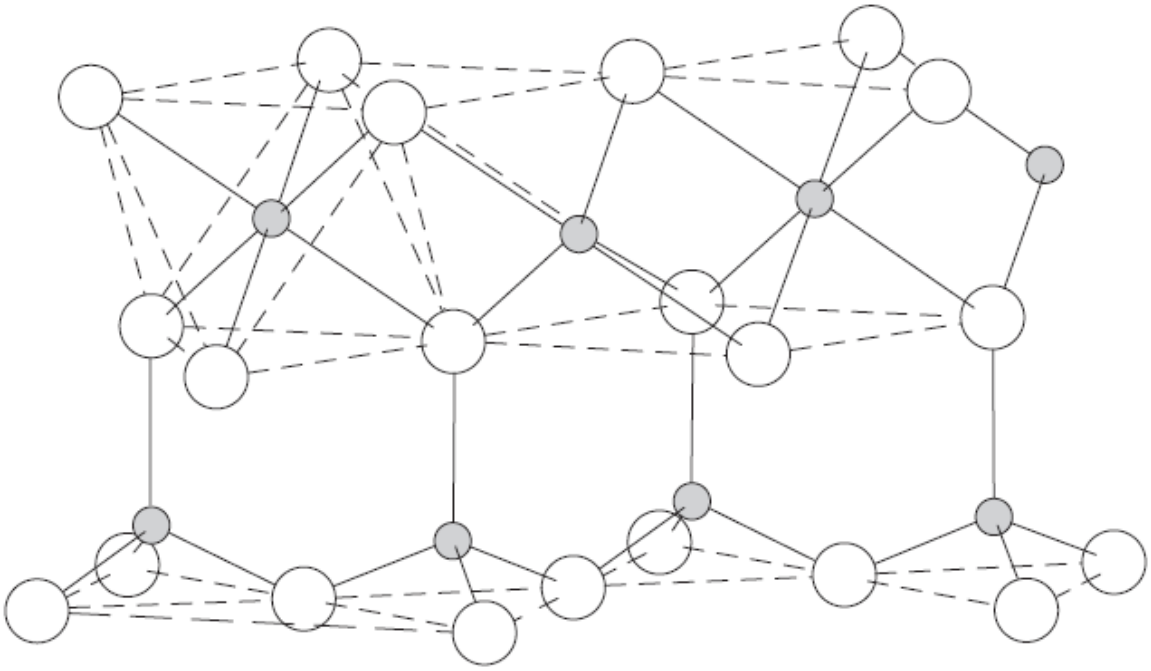
?

60 The large coal fields found in Pennsylvania provide evidence that the climate of the northeastern United States was much warmer during the Carboniferous Period. This change in climate over time is best explained by the

(1) movements of tectonic plates
(2) effects of seasons
(3) changes in the environment caused by humans
(4) evolution of life

The diagram below represents a part of the crystal structure of the mineral kaolinite.

Structure of Kaolinite

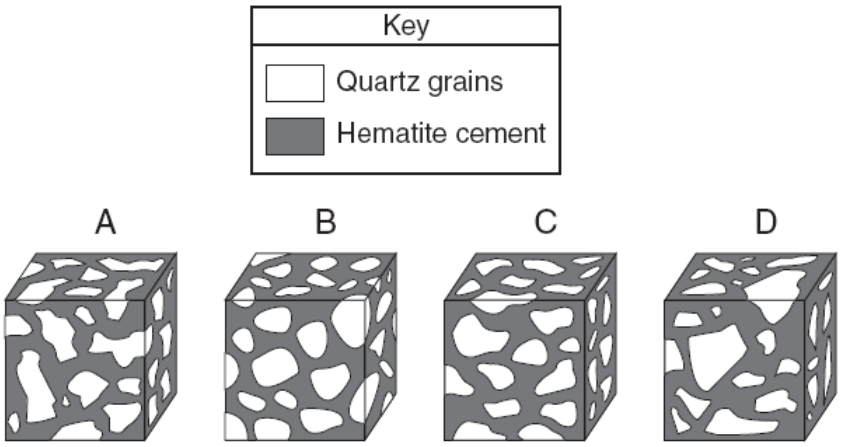


?

61 An arrangement of atoms such as the one shown in the diagram determines a mineral's

(1) age of formation
(2) infiltration rate
(3) physical properties
(4) temperature of formation

The diagram below shows four magnified block-shaped sandstone samples labeled *A*, *B*, *C*, and *D*. Each sandstone sample contains quartz grains of different shapes and sizes. The quartz grains are held together by hematite cement.



62 In which sample did the quartz grains undergo the most abrasion during erosional transport?

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

63 Rocks are classified as igneous, sedimentary, or metamorphic based primarily on their

(1) texture
(2) crystal or grain size
(3) method of formation
(4) mineral composition

64 Which three minerals are most commonly found in the igneous rock granite?

(1) amphibole, calcite, and hematite
(2) amphibole, biotite mica, and gypsum
(3) plagioclase feldspar, pyroxene, and olivine
(4) plagioclase feldspar, potassium feldspar, and quartz

65 When granite melts and then solidifies, it becomes

(1) a sedimentary rock
(2) an igneous rock
(3) a metamorphic rock
(4) sediments

66 The internal atomic structure of a mineral most likely determines the mineral's

(1) color, streak, and age
(2) origin, exposure, and fracture
(3) size, location, and luster
(4) hardness, cleavage, and crystal shape

67 During the Permian Period, sedimentary bedrock in the Appalachian Region was subjected to high temperature and pressure. Calcite deposits that had existed in this environment would most likely have formed

(1) schist
(2) gabbro
(3) marble
(4) gneiss

68 Which phrase best describes coal?

(1) low density, mafic
(2) chemical precipitate
(3) organic plant remains
(4) glassy texture, volcanic

The diagram below shows a sedimentary rock sample.

(Shown actual size)

69 Which agent of erosion was most likely responsible for shaping the particles forming this rock?

(1) mass movement (3) glacial ice
(2) wind (4) running water

The photograph below shows a piece of halite that has been recently broken
.

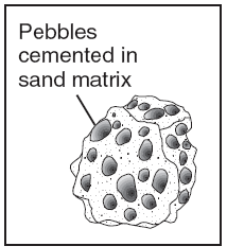
70 Which physical property of halite is demonstrated by this pattern of breakage?

(1) hardness (3) cleavage
(2) streak (4) luster

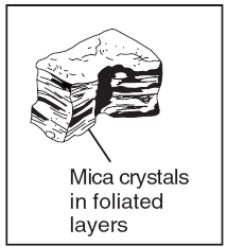
71 Which mineral will scratch glass (hardness = 5.5), but not pyrite?

(1) gypsum (3) orthoclase
(2) fluorite (4) quartz

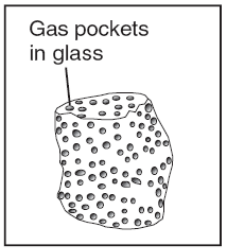
72 Which rock most probably formed directly from lava cooling quickly at Earth's surface?



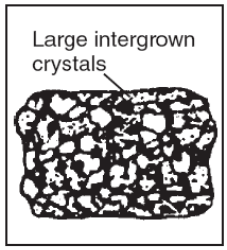
(1)



(3)



(2)



(4)

73 Bedrock located near Old Forge, New York, would most likely have which characteristics?

(1) clastic texture consisting of angular sediments of mostly quartz and feldspar cemented together

(2) crystalline texture composed predominantly of gypsum

(3) noncrystalline, glassy texture with a dark color

(4) foliated texture with mica and feldspar separated into bands

74 What is the best way to determine if a mineral sample is calcite or quartz?

(1) Observe the color of the mineral.
(2) Place the mineral near a magnet.
(3) Place a drop of acid on the mineral.
(4) Measure the mass of the mineral.

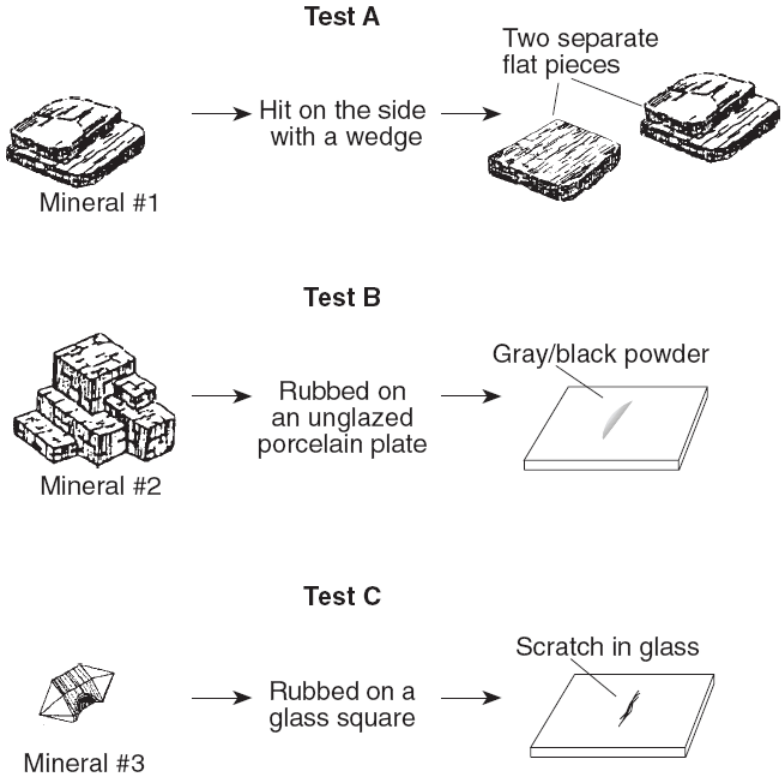
76 Which two rocks have the most similar mineral composition?

(1) marble and rhyolite
(2) limestone and basalt
(3) quartzite and rock salt
(4) granite and phyllite

75 Which rock is foliated, shows mineral alignment but not banding, and contains medium-sized grains of quartz and pyroxene?

(1) phyllite (3) gneiss
(2) schist (4) quartzite

Base your answers to questions 77 and 78 on the diagram below, which shows three minerals with three different physical tests, *A*, *B*, and *C*, being performed on them.



77 Which sequence correctly matches each test, *A*, *B*, and *C*, with the mineral property tested?

(1) *A*—cleavage; *B*—streak; *C*—hardness
(2) *A*—cleavage; *B*—hardness; *C*—streak
(3) *A*—streak; *B*—cleavage; *C*—hardness
(4) *A*—streak; *B*—hardness; *C*—cleavage

78 The results of all three physical tests shown are most useful for determining the

(1) rate of weathering of the minerals
(2) identity of the minerals
(3) environment where the minerals formed
(4) geologic period when the minerals formed

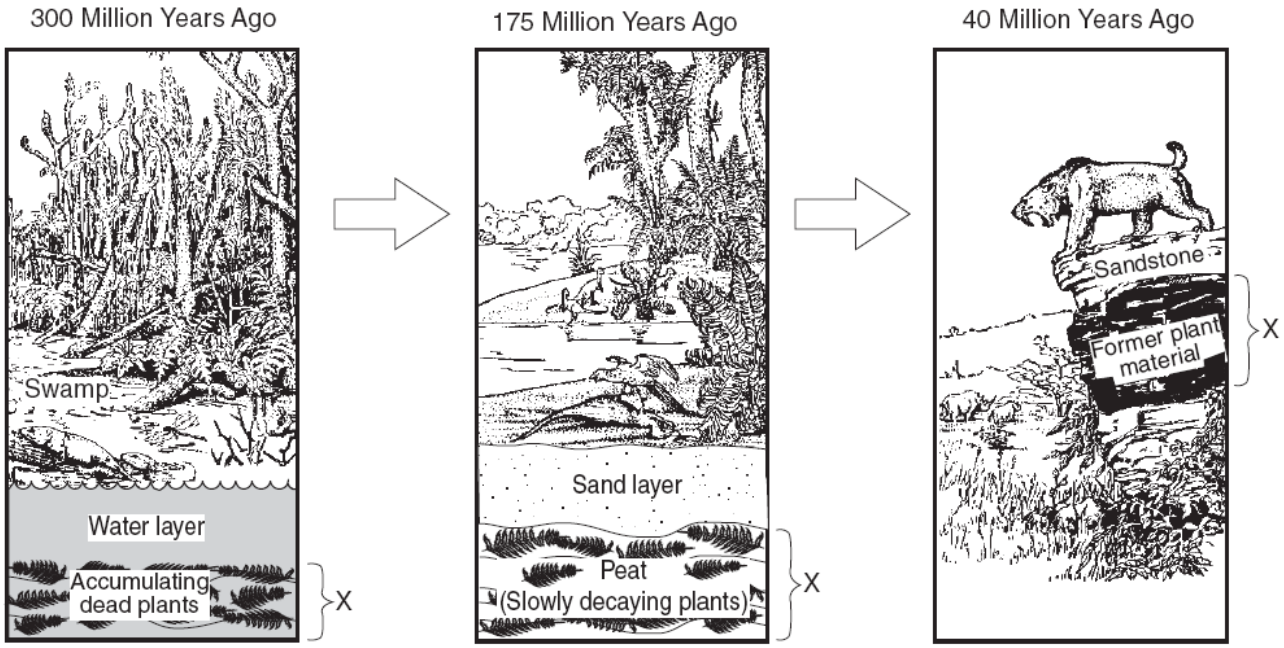
79 During the intrusion of the Palisades Sill, contact metamorphism changed sandstone and shale into

(1) diorite
(2) marble
(3) limestone
(4) hornfels

80 Which process most likely formed a layer of the sedimentary rock, gypsum?

(1) precipitation from seawater
(2) solidification of magma
(3) folding of clay-sized particles
(4) melting of sand-sized particles

The sequence of diagrams below represents the gradual geologic changes in layer *X*, located just below Earth's surface.



81 Which type of sedimentary rock was formed at layer *X*?

(1) conglomerate
(2) shale
(3) rock salt
(4) coal

82 An unidentified mineral that is softer than calcite exhibits a metallic luster and cubic cleavage. This mineral most likely is

(1) galena
(2) pyrite
(3) halite
(4) pyroxene

83 Which two kinds of adjoining bedrock would most likely have a zone of contact metamorphism between them?

(1) shale and conglomerate
(2) shale and sandstone
(3) limestone and sandstone
(4) limestone and granite

The diagram below shows a rock with deformed structure and intergrown crystals.

84 The rock was probably formed by

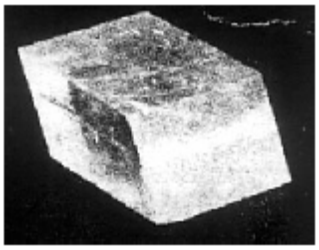
(1) sediments that were deposited on the ocean floor
(2) heat and pressure that changed a preexisting rock
(3) volcanic lava that cooled on Earth's surface
(4) a meteor impact on Earth's surface

The diagram below shows how a sample of the mineral mica breaks when hit with a rock hammer.

87 This mineral breaks in smooth, flat surfaces because it

(1) is very hard
(2) is very dense
(3) contains large amounts of iron
(4) has a regular arrangement of atoms

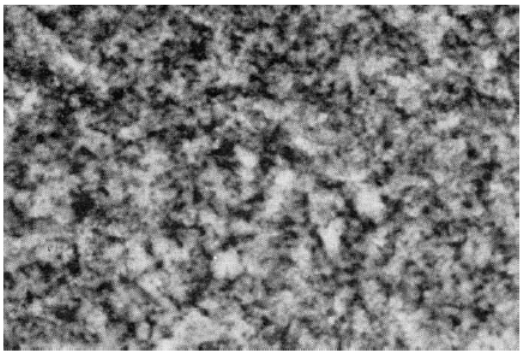
The photograph below shows a broken piece of the mineral calcite.



85 The calcite breaks in smooth, flat surfaces because calcite

(1) is very dense
(2) is very soft
(3) contains certain impurities
(4) has a regular arrangement of atoms

The photograph below shows actual crystal sizes in a light-colored igneous rock that contains several minerals, including potassium feldspar, quartz, and biotite mica.



(Shown to actual size)

88 The rock should be identified as

(1) granite (3) basalt
(2) gabbro (4) rhyolite

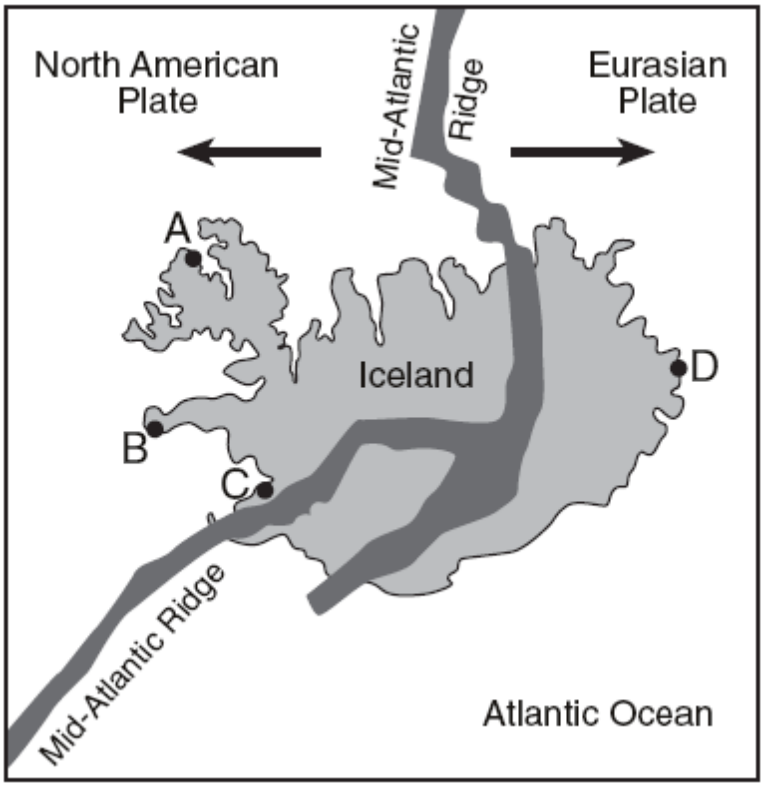
86 Which common rock is formed from the solidification of molten material?

(1) rock gypsum (3) rhyolite
(2) slate (4) coal

89 Rocks can be classified as sedimentary, igneous, or metamorphic based primarily upon differences in their

(1) color (3) origin
(2) density (4) age

Base your answers to questions 90 and 91 on the map below of Iceland, a country located on the Mid-Atlantic Ridge. Four locations are represented by the letters *A* through *D*.



90 The fine-grained texture of most of the igneous rock formed on the surface of Iceland is due to

(1) rapid cooling of the molten rock
(2) high density of the molten rock
(3) numerous faults in the island's bedrock
(4) high pressure under the island

91 The youngest bedrock is most likely found at which location?

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

The diagrams below represent four rock samples.

92 Which rock was formed by rapid cooling in a volcanic lava flow? [The diagrams are not to scale.]

Bands of alternating light and dark minerals

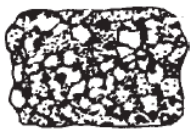
(1)

Glassy black rock that breaks with a shell-shape fracture

(3)

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

(2)



Interlocking 0.5-cm-diameter crystals of various colors

(4)

93 Which mineral leaves a green-black powder when rubbed against an unglazed porcelain plate?

(1) galena (3) hematite
(2) graphite (4) pyrite

94 Which statement about the minerals plagioclase feldspar, gypsum, biotite mica, and talc can best be inferred from the chart?

(1) These minerals have the same chemical and physical properties.

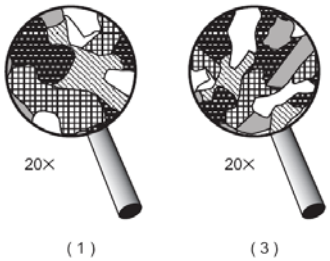
(2) These minerals have different chemical properties, but they have similar physical properties.

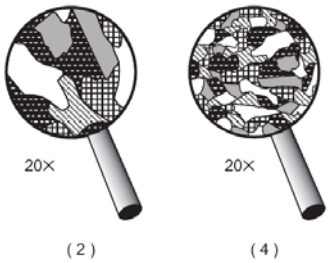
(3) These minerals have different physical and chemical properties, but they have identical uses.

(4) The physical and chemical properties of these minerals determine how humans use them.

The diagrams below show the crystals of four different rocks viewed through the same hand lens.

95 Which crystals most likely formed from molten material that cooled and solidified most rapidly?





96 Which mineral scratches dolomite and is scratched by olivine?

(1) galena
(2) quartz
(3) potassium feldspar
(4) muscovite mica

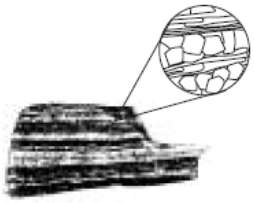
97 Minerals from this chart are found in several different rocks. Which two rocks are primarily composed of a mineral that bubbles with acid?

(1) limestone and marble
(2) granite and dolostone
(3) sandstone and quartzite
(4) slate and conglomerate

99 Which mineral is white or colorless, has a hardness of 2.5, and splits with cubic cleavage?

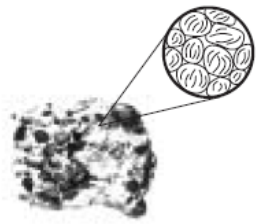
(1) calcite (3) pyrite
(2) halite (4) mica

Base your answers to questions 46 and 47 on the pictures of four rocks shown below. Magnified views of the rocks are shown in the circles.



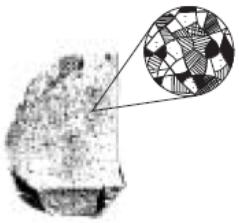
Rock 1

Bands of coarse intergrown crystals of various sizes



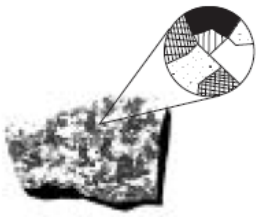
Rock 2

Particles of 0.01-cm to 1.0-cm size cemented together



Rock 3

Intergrown crystals less than 0.1 cm in size



Rock 4

Intergrown crystals, mostly 2.0 cm in size

100 Which rock is metamorphic and shows evidence of foliation?

(1) 1 (3) 3
(2) 2 (4) 4

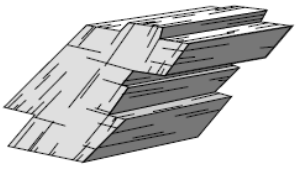
101 What do all four rock samples have in common?

(1) They show cleavage.
(2) They contain minerals.
(3) They are organically formed.
(4) They formed on Earth's surface.

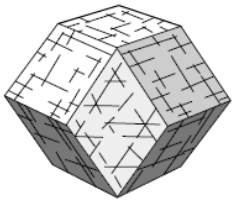
102 Which sedimentary rock is most likely to be changed to slate during regional metamorphism?

(1) breccias (3) dolostone
(2) conglomerate (4) shale

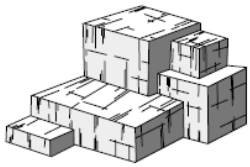
103 Halite has three cleavage directions at 90° to each other. Which model best represents the shape of a broken sample of halite?



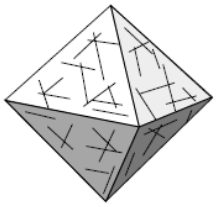
(1)



(3)



(2)



(4)

?

104 An extrusive igneous rock with a mineral composition of 35% quartz, 35% potassium feldspar, 15% plagioclase feldspar, 10% biotite, and 5% amphibole is called

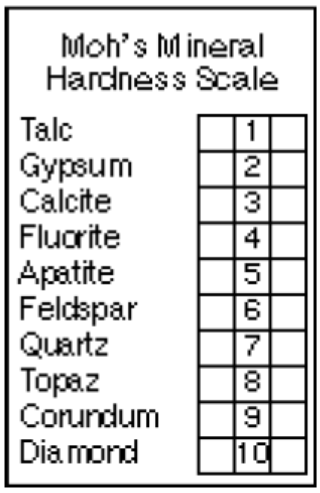
(1) rhyolite
(2) granite
(3) gabbro
(4) basaltic glass

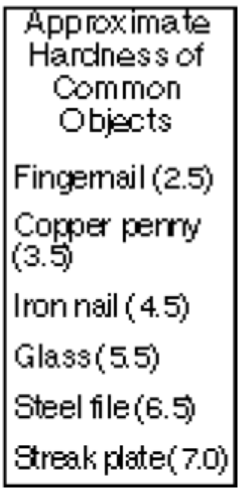
105 Which sequence of change in rock type occurs as shale is subjected to increasing heat and pressure?

(1) shale – schist – phyllite – slate – gneiss
(2) shale – slate – phyllite – schist – gneiss
(3) shale – gneiss – phyllite – slate – schist
(4) shale – gneiss – phyllite – schist – slate

?

Base your answers to questions 39 and 40 on Moh's mineral hardness scale and the chart below showing the approximate hardness of some common objects.





?

106 Which statement is best supported by this scale?

(1) A fingernail will scratch calcite, but not quartz.
(2) A fingernail will scratch quartz, but not calcite.
(3) A piece of glass can be scratched by quartz, but not by calcite.
(4) A piece of glass can be scratched by calcite, but not by quartz.

?

107 The hardness of these minerals is most closely related to the

(1) mineral's color
(2) mineral's abundance in nature
(3) amount of iron the mineral contains
(4) internal arrangement of the mineral's atoms