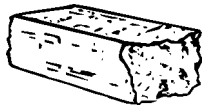
Name: _____

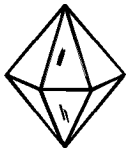
1) The table below shows some characteristics of a rock-forming mineral.

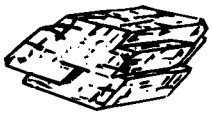
Mineral	Cleavage	Hardness	Density (g/cm^3)	Other Properties
Pyroxene (a complex family of minerals; augite is most common)	Two flat planes at nearly right angles	5–6	3.2–3.9	Found in igneous and metamorphic rocks; augite is dark green to black; other varieties are white to green

Which diagram *best* represents a sample of pyroxene?

A) 

B) 

C) 

D) 

2) According to the *Earth Science Reference Tables*, an igneous rock containing large, visible crystals of pyroxene is *best* described as

A) felsic and formed deep within the Earth's crust
B) mafic and formed near the Earth's surface
C) mafic and formed deep within the Earth's crust
D) felsic and formed near the Earth's surface

3) Analysis of a granite pebble would probably show that the pebble consists mostly of the

A) elements iron and magnesium
B) minerals quartz and feldspar
C) minerals calcite and gypsum
D) elements carbon and hydrogen

IGNEOUS ROCKS

Rock	Description	Minerals in Rock	Method of Formation	Use
Granite	Light colored, gray to pink	***A***	Intrusive	Building stone, monuments
Pumice	Light to gray	Feldspar and quartz	Extrusive	Scouring powders and soaps
B	Dark colored, gray to black, coarse grained	Feldspar and pyroxene	Intrusive	Building stone
Basalt Scoria	Dark colored, fine grained	Feldspar and pyroxene	Extrusive	Building stone, railway ballast
Obsidian (volcanic glass)	Dark colored	Feldspar and quartz	Extrusive	Ornaments, arrowheads

4) Based on the information given in the "Igneous Rocks" table, which rock is represented by the letter *B*?

A) gabbro B) granite C) rhyolite D) basalt

5) The diagrams below represent five different rock samples.

Bands of alternating light and dark intergrown minerals — ***A***

Easily split layers of 0.0001-cm-diameter particles cemented together — ***B***

Glassy black rock that breaks with a shell-shape fracture — ***C***

Intergrown 0.5-cm-diameter crystals of various colors — ***D***

Sand and pebbles cemented together — ***E***

Which sample formed from lava that cooled rapidly?

A) *A* B) *D* C) *E* D) *C*

6) The size of the mineral crystals found in an igneous rock is directly related to the

A) density of the minerals
B) amount of sediments cemented together
C) cooling time of the molten rock
D) color of the minerals

7) Olivine and pyroxene are commonly found in igneous rocks that are

A) mafic, with low density
B) mafic, with high density
C) felsic, with high density
D) felsic, with low density

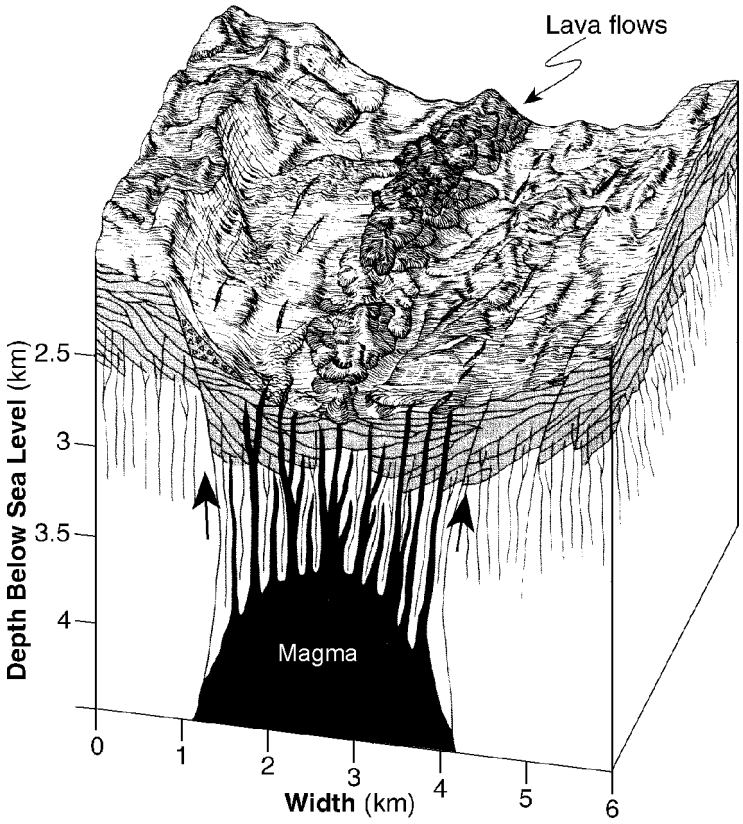
8) According to the *Earth Science Reference Tables*, what are the four most abundant elements, by volume, in the Earth's crust?

A) aluminum, calcium, hydrogen, and iron
B) hydrogen, oxygen, nitrogen, and potassium
C) oxygen, potassium, sodium, and calcium
D) aluminum, iron, silicon, and magnesium

9) The mineral mica breaks evenly along flat sheets mainly because of its

A) atomic arrangement
B) hardness
C) chemical composition
D) density

10) The diagram below shows details of a section of a rift valley in the center of a mid-ocean ridge. The vertical lines in the diagram represent faults and fractures within the ocean floor bedrock.



The dark-colored lava flows shown in the diagram were pushed from the magma chamber onto the surface of the ocean floor. Which characteristics are present in the solid rock that formed when the lava flows cooled?

A) generally small grain size and felsic composition
B) generally small grain size and mafic composition
C) generally large grain size and felsic composition
D) generally large grain size and mafic composition

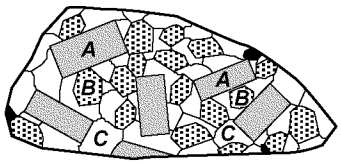
11) An extrusive igneous rock with a mineral composition of 35% quartz, 35% potassium feldspar, 15% plagioclase feldspar, 10% biotite, and 5% amphibole is called

A) granite B) basaltic glass C) rhyolite D) gabbro

12) A family wants to use rock materials as flooring in the entrance of their new house. They have narrowed their choice to granite or marble. Which of these rocks is more resistant to the physical wear of foot traffic and explain why this rock is more resistant.

13) State *two* processes responsible for the formation of an igneous rock.

14) The diagram below represents a felsic igneous rock. Letters *A*, *B*, and *C* represent three different minerals in the rock sample. The table describes the physical properties of minerals *A*, *B*, and *C* found in the igneous rock sample.

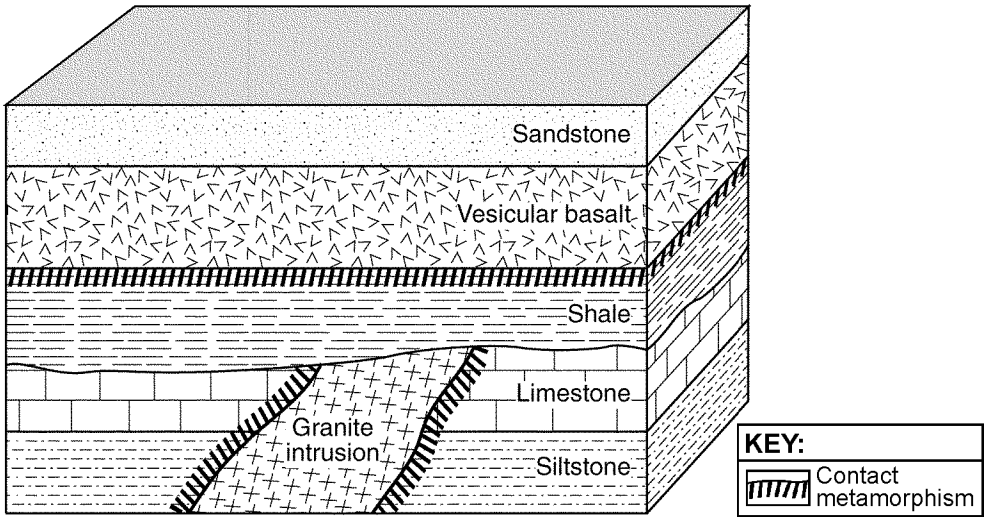


(Actual size)

Mineral	Key	Physical Properties
A		pink, cleaves in two directions at 90°
B		white, cleaves in two directions, striations visible
C		colorless or clear with a glassy luster

State the texture of the igneous rock shown in the diagram.

15) Radioactive dating on the geologic cross section below indicates that the granite intrusion is 279 million years old and the vesicular basalt is 260 million years old. The rock layers have not been overturned.



Describe the rate of cooling that must occur for magma to form vesicular basalt.

16) Which of the following processes could lead directly to the formation of pumice rock?

A) explosive eruption of lava from a volcano
B) metamorphism of unmelted rock material
C) deposition of quartz sand
D) precipitation of minerals from evaporating seawater

17) What is the *best* way to determine if a mineral sample is calcite or quartz?

A) Observe the color of the mineral.
B) Measure the mass of the mineral.
C) Place a drop of acid on the mineral.
D) Place the mineral near a magnet.

1) A

2) C

3) B

4) A

5) D

6) C

7) B

8) C

9) A

10) B

11) C

12) Answers may vary.
SAMPLE ANSWERS: Granite is composed mainly of quartz and feldspar that are resistant to abrasion because of their hardness (7 and 6, respectively), while marble is made of calcite, which is softer (hardness of 3).

13) Answers may vary.
SAMPLE ANSWERS: melting and solidification OR melting and crystallization OR cooling and crystallization

14) Answers may vary.
SAMPLE ANSWERS: coarse OR nonvesicular OR large grains OR big crystals

15) Answers may vary.
SAMPLE ANSWERS: fast rate OR rapid cooling

16) A

17) C