8. The three main classes of rocks are classified by how they formed. (1) _______ rocks form from molten rock. (2) _______ rocks form by surface processes. (3) _______ rocks form from existing rocks that are changed by pressure and temperature.

A. (1) igneous  (2) sedimentary  (3) metamorphic
B. (1) igneous  (2) metamorphic  (3) sedimentary
C. (1) metamorphic  (2) sedimentary  (3) igneous
D. (1) sedimentary  (2) metamorphic  (3) igneous
E. none of the above combinations

8. Rocks do not have a specific chemical formula because:

A. a rock can change its characteristics at any time
B. the density of rocks can vary dramatically with depth in the Earth
C. elements combine randomly to form minerals
D. we prefer to give rocks names that are easy to remember
E. they are a mix of different minerals, each with their own chemical formulas

8. Molten rock inside the earth is called (1) _____ but on the surface it is called (2) _____.

A. (1) lava  (2) magma
B. (1) lava  (2) extrusive
C. (1) intrusive  (3) magma
D. (1) magma  (2) lava
E. (1) extrusive  (2) intrusive

8. The rate that temperature increases with increasing depth inside the earth is called:

A. the geothermal gradient
B. the isothermal gradient
C. the hydrothermal gradient
D. the mesothermal gradient
E. the Celsius scale

8. On average, the geothermal gradient inside the Earth’s crust is about:

A. 1000°C per kilometer
B. 100°C per kilometer
C. 50°C per kilometer
D. 25°C per kilometer
E. 10°C per kilometer

8. Molten rock below the Earth’s surface is called (1) _______ and typically forms at depths of (2)_______:

A. (1) lava  (2) less than 100 km
B. (1) lava  (2) less than 10 km
C. (1) magma  (2) less than 100 km
D. (1) magma  (2) less than 10 km
E. (1) magma  (2) the vicinity of the outer core

8. The melting temperature of a rock is influenced by:

A. pressure
B. water content
C. chemistry
D. all of the above
E. only A and C above

8. The inside of the earth is not completely molten (i.e. liquid) because:

A. it never gets hot enough to melt rocks deep in the earth
B. the melting temperature of rocks increases as pressure increases
C. its chemistry always causes it to be a solid with the consistency of salt water taffy
D. the earth would collapse in on itself if it had a liquid interior
E. none of the above because the inside of the earth is completely molten

8. A mineral that is heated up and melts at 800°C in an oven at the Earth’s surface may remain a solid at 800°C deep down in the Earth’s crust because:
   A. there is less water present
   B. oxygen in the atmosphere affects the melting temperature
   C. the melting point is different at sea level than higher up
   D. all minerals remain solid in the Earth’s crust
   E. the melting temperature rises as pressure increases

8. As a rock starts to melt, the minerals with the lowest melting temperature will start to melt first, forming magma. This melted portion can get squeezed away from the still solid part of the rock through a process called:
   A. partial melting
   B. fractionation
   C. differentiation
   D. volcanic eruption
   E. crystallization

8. After partial melting of a rock occurs in the Earth’s crust, the process whereby the melt moves away from the remaining solid portion of the rock is called:
   A. the squeegee effect
   B. volcanic eruption
   C. fractionation
   D. magmatic differentiation
   E. Bowen’s reaction series

8. The type of magma that contains the most silica is:
   A. felsic
   B. intermediate
   C. mafic
   D. ultramafic
   E. it depends on the temperature

8. The different types of magma, listed in order from lowest to highest silica content, are:
   A. felsic, intermediate, mafic, ultramafic
   B. felsic, mafic, intermediate, ultramafic
   C. mafic, ultramafic, intermediate, felsic
   D. ultramafic, mafic, felsic, intermediate
   E. ultramafic, mafic, intermediate, felsic

8. The viscosity of lava is a measure of:
   A. the temperature when melting occurs
   B. the speed it flows
   C. the amount of silica present in the lava
   D. the ability of the lava to resist flowing downhill
   E. the amount of dissolved gas in the lava

8. Which of the following types of lava has the lowest viscosity and therefore flows the fastest and furthest?
   A. felsic
   B. intermediate
   C. mafic
   D. ultramafic
   E. intermafic

8. Which of the following types of lava has the highest viscosity and therefore has great difficulty flowing?
   A. felsic
   B. ultramafic
   C. mafic
   D. intermediate
   E. ketchup
8. Which of the following types of lava has the lowest viscosity and therefore flows the fastest?
   A. felsic
   B. intermediate
   C. mafic
   D. strawberry syrup
   E. ketchup

8. The most common type of igneous rock in the solar system forms from mafic lava and is called:
   A. basalt
   B. granite
   C. peridotite
   D. limestone
   E. andesite

8. What do we call mafic lava that is smooth and syrupy?
   A. magma
   B. pahoehoe
   C. a’a
   D. spatter
   E. cinders

8. What controls the size of crystals that form an igneous rock?
   A. magma chemistry
   B. rate of cooling
   C. types of minerals
   D. Bowen’s reaction series
   E. type of volcano