XC #1 Questions

Part I

1 Young frogs do not resemble adult frogs. Which term is given to this pattern of development in frogs?

(1) asexual reproduction
(2) cloning
(3) metamorphosis
(4) biological adaptation

2 The streaks in the time-lapse photograph below show the apparent motion of the stars around the North Star during one hour.

Source: Photograph by Verkes Observatory

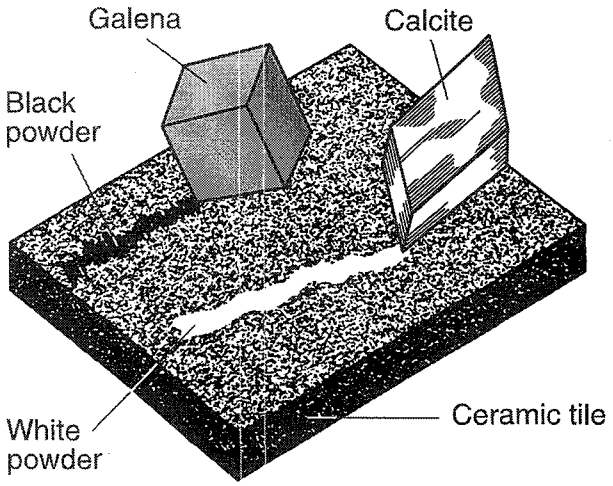
This apparent motion of the stars can best be explained by Earth's

(1) rotation on its axis
(2) tilted axis
(3) revolution around the North Star
(4) changing distance from the North Star

3 In addition to oxygen, which gases make up the largest percentage of Earth's atmosphere?

(1) hydrogen, helium, and water vapor
(2) hydrogen, methane, and ozone
(3) carbon dioxide, water vapor, and nitrogen
(4) carbon dioxide, methane, and helium

4 The diagram below shows a method for determining a physical property of a mineral. The results are shown for two minerals, galena and calcite.



Which property of the galena and calcite is indicated by the color of the powder each leaves on the ceramic tile?

(1) streak
(2) hardness
(3) reaction to an acid
(4) reaction to a solvent

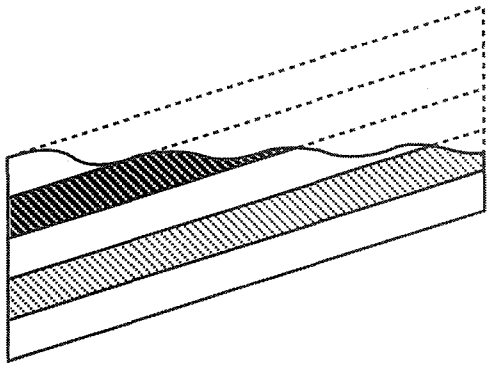
5 The wheels and gears of a machine are greased in order to *decrease*

(1) potential energy
(2) efficiency
(3) output
(4) friction

6 Weather forecasts are more accurate today than in the past due to

(1) global warming
(2) air-quality control
(3) plate tectonics
(4) use of images from space

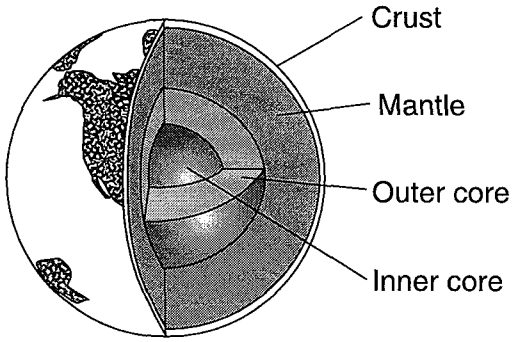
7 The diagram below shows tilted rock layers. The dashed lines represent missing parts of the rock layers.



Which process is most likely responsible for the removal of the missing parts of the rock layers?

(1) erosion
(2) deposition
(3) earthquakes
(4) faulting

Base your answers to questions 8 and 9 on the diagram below, which shows a model of Earth's interior.



(Not drawn to scale)

8 What information did scientists study in order to develop this model?

(1) recordings of earthquake waves
(2) locations of recent volcanic activity
(3) core samples from seafloor drillings
(4) fossils found in rocks

9 Many scientists believe that crustal plate movement occurs because of convection cells contained in Earth's

(1) crust
(2) mantle
(3) outer core
(4) inner core

10 Rocks are classified as igneous, metamorphic, or sedimentary according to

(1) their color
(2) their shape
(3) how they formed
(4) the minerals they contain

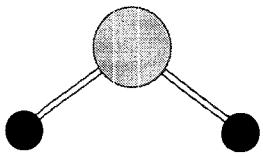
11 Sand and iron particles that are similar in size and color are mixed together in a beaker. What would be the best method of separating the particles?

(1) Use tweezers to separate them.
(2) Use a magnet to separate them.
(3) Add water to the mixture.
(4) Pour the mixture into a filter.

12 Which action forms a different chemical substance?

(1) crushing a rock
(2) burning a piece of wood
(3) mixing salt and pepper
(4) melting an ice cube

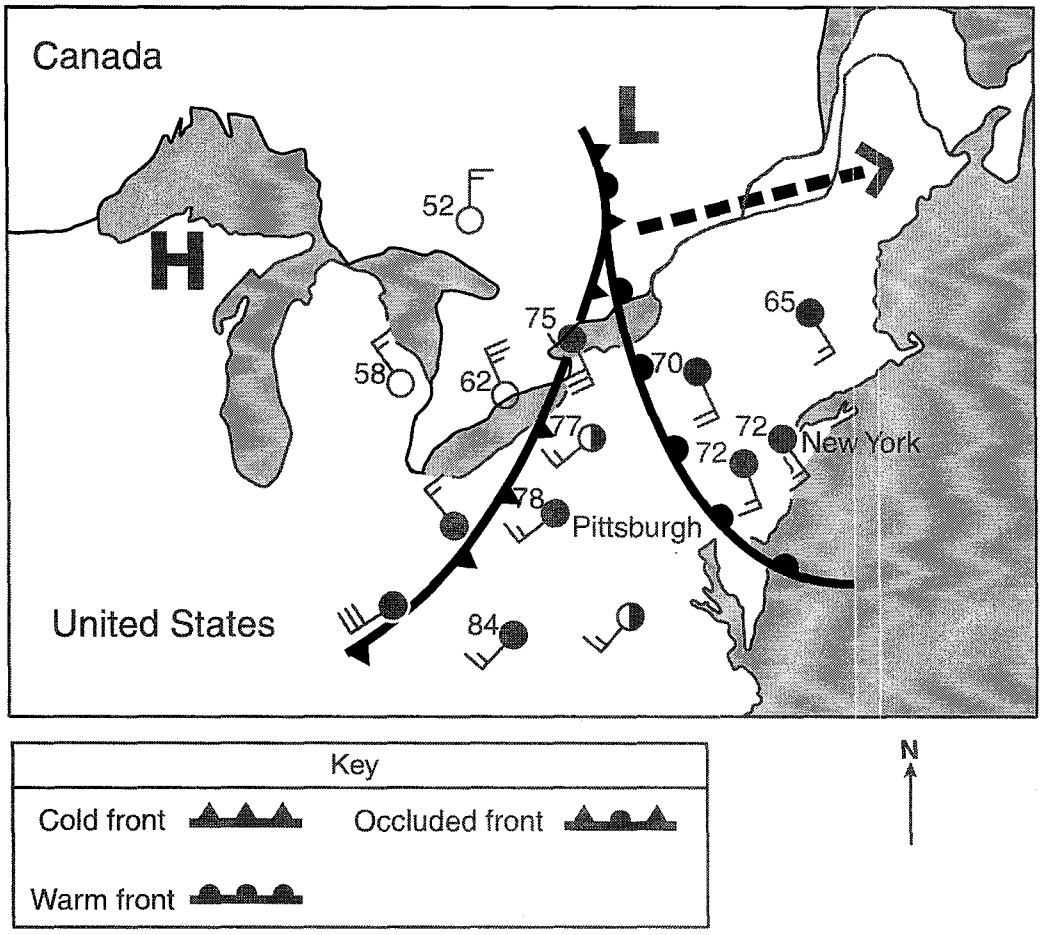
13 The diagram below shows the geometric structure of a molecule of water (H_2O).



What do the symbols  and  represent in the model?

(1) genetic material
(2) chemical bonds
(3) cells
(4) atoms

Base your answers to questions 14 and 15 on the weather map below, which shows a typical low-pressure system located over part of North America in May. The numbers on the map indicate the air temperature in degrees Fahrenheit.



14 The fronts shown on the weather map are best described as

(1) boundaries between different air masses
(2) boundaries between different wind belts
(3) areas experiencing clear skies with light winds
(4) areas experiencing extremely warm air temperatures

15 The symbol (-----➔) shown on the map best represents

(1) the probable direction of storm movement for the next 12 hours
(2) ocean currents moving the storm system toward the east
(3) convection currents associated with the storm system
(4) the beginning location of the storm system

16 The data table below shows the mass of an 800-gram block of ice as it melts to a 600-gram block of ice.

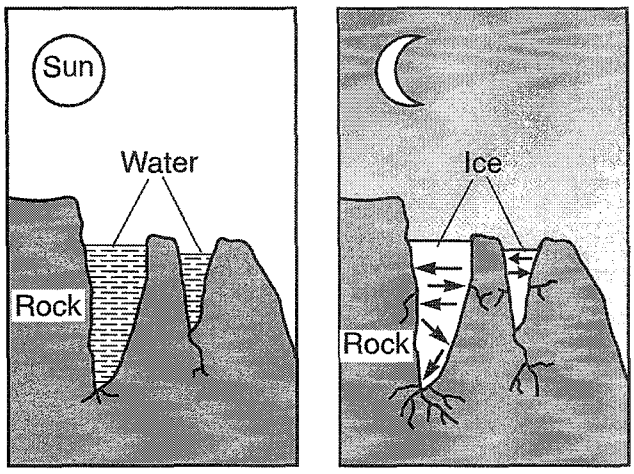
Data Table

Time (minutes)	Mass of Block of Ice (grams)
0	800
15	750
30	700
45	650
60	600

If the current rate of melting continues, how many more minutes will be required for the 600-gram block of ice to reach a mass of 400 grams?

(1) 15
(2) 30
(3) 45
(4) 60

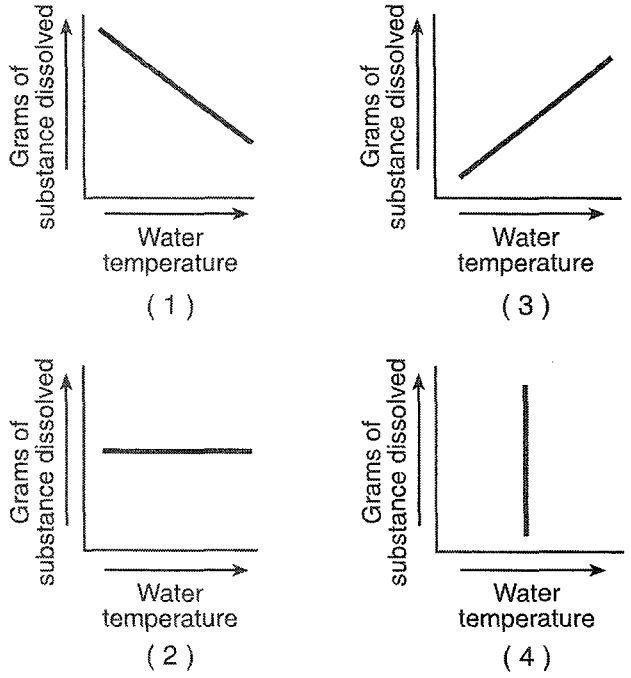
17 The diagrams below show a natural process that weathers rock.



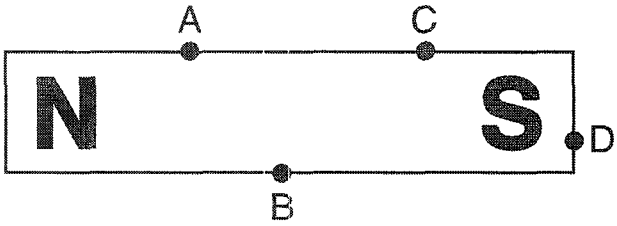
Which statement best explains why this process results in weathering?

(1) Frozen water acts as a solute.
(2) Water expands when it freezes.
(3) The mass of water increases when it freezes.
(4) Frozen water dissolves most types of rocks.

18 Which graph shows that more grams of a substance can be dissolved in water as the water temperature increases?



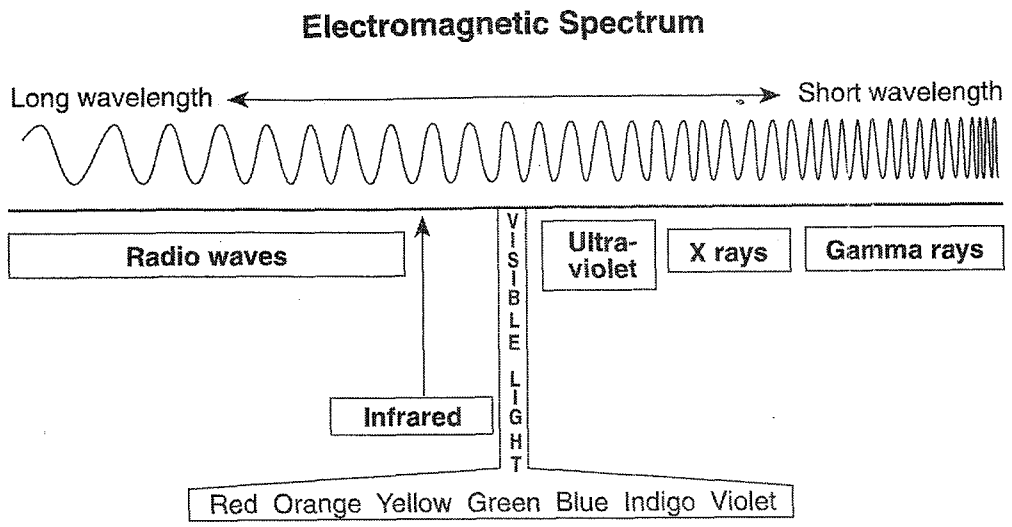
19 Letters *A*, *B*, *C*, and *D* represent locations on a bar magnet.



Which location has the greatest magnetic force?

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

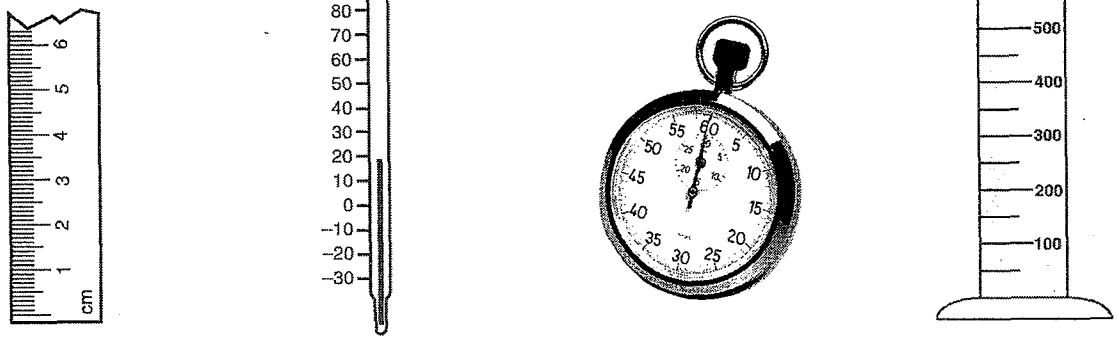
20 The diagram below represents several forms of electromagnetic energy.



Which feature best distinguishes one form of electromagnetic energy from another?

(1) color
(2) wavelength
(3) surface temperature
(4) distance traveled

21 Which instrument could be used to determine the volume of an irregularly shaped solid?



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

45 A student wanted to study the amount of mold growing on pizza at different temperatures. In the experiment, the student set up four identical pans of pizza. Each pan contained the same amount of pizza. The temperatures and light conditions are shown in the data table below.

Data Table

Variables	Pan 1	Pan 2	Pan 3	Pan 4
Temperature	–10°C	0°C	15°C	30°C
Light conditions	kept in darkness	kept in bright light	kept in darkness	kept in bright light

One error made in setting up the experiment was that the four pans of pizza

(1) were at different temperatures
(2) were different sizes
(3) had different ingredients
(4) received different amounts of light