Name: _____ Date: _____ Pd. _____

EES - Weathering

____1. Which property of water makes frost action a common and effective form of weathering?
(1) Water dissolves many earth materials.
(2) Water loses 334 Joules of heat per gram when it freezes.
(3) Water expands when it freezes.
(4) Water cools the surroundings when it evaporates.

____2. Which process involves either a physical or chemical breakdown of earth materials?
(1) deposition (3) weathering
(2) sedimentation (4) cementing

____3. In which climate would the chemical weathering of limestone occur most rapidly?
(1) cold and dry (3) warm and humid
(2) cold and humid (4) warm and dry

____4. Which type of climate has the greatest amount of rock weathering caused by frost action?
(1) a wet climate in which temperatures remain below freezing
(2) a wet climate in which temperatures alternate from below freezing to above freezing
(3) a dry climate in which temperatures remain below freezing
(4) a dry climate in which temperatures alternate from below freezing to above freezing

____5. Which characteristic would most likely remain constant when a limestone cobble is subjected to extensive abrasion?
(1) shape (3) volume
(2) mass (4) composition

____6. Chemical weathering will occur most rapidly when rocks are exposed to the
(1) hydrosphere and lithosphere
(2) lithosphere and atmosphere
(3) hydrosphere and atmosphere
(4) mesosphere and thermosphere

____7. Water is a major agent of chemical weathering because water
(1) has a density of about one gram per cubic centimeter
(2) cools the surroundings when it evaporates
(3) dissolves many of the minerals that make up rocks
(4) has the highest specific heat of all common earth materials

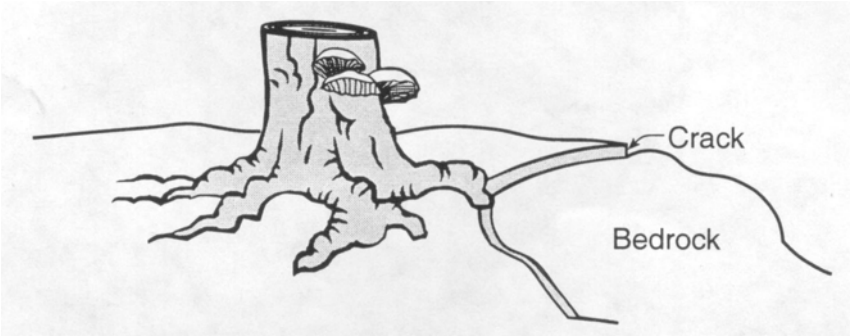
____8. Rock samples brought back from the Moon show absolutely no evidence of chemical weathering. This is most likely due to
(1) extremely low surface temperatures on the Moon
(2) the lack of an atmosphere on the Moon
(3) lack of biological activity on the Moon
(4) large quantities of water in the lunar "seas"

____9. Which geologic feature is caused primarily by chemical weathering?
(1) blocks of basalt at the base of a steep slope
(2) large caves in limestone bedrock
(3) the smooth, polished surface of a rock in a dry, sandy area
(4) a pattern of parallel cracks in a granite mountain

____10. Which activity demonstrates chemical weathering?
(1) dissolving of limestone by acid rain
(2) freezing of water in the cracks of a sandstone sidewalk
(3) abrasion of a streambed by tumbling rocks
(4) grinding of talc into a powder

____11. Which factor has the *least* effect on the weathering of a rock?
(1) the number of fossils found in the rock
(2) exposure of the rock to the atmosphere
(3) climatic conditions
(4) composition of the rock

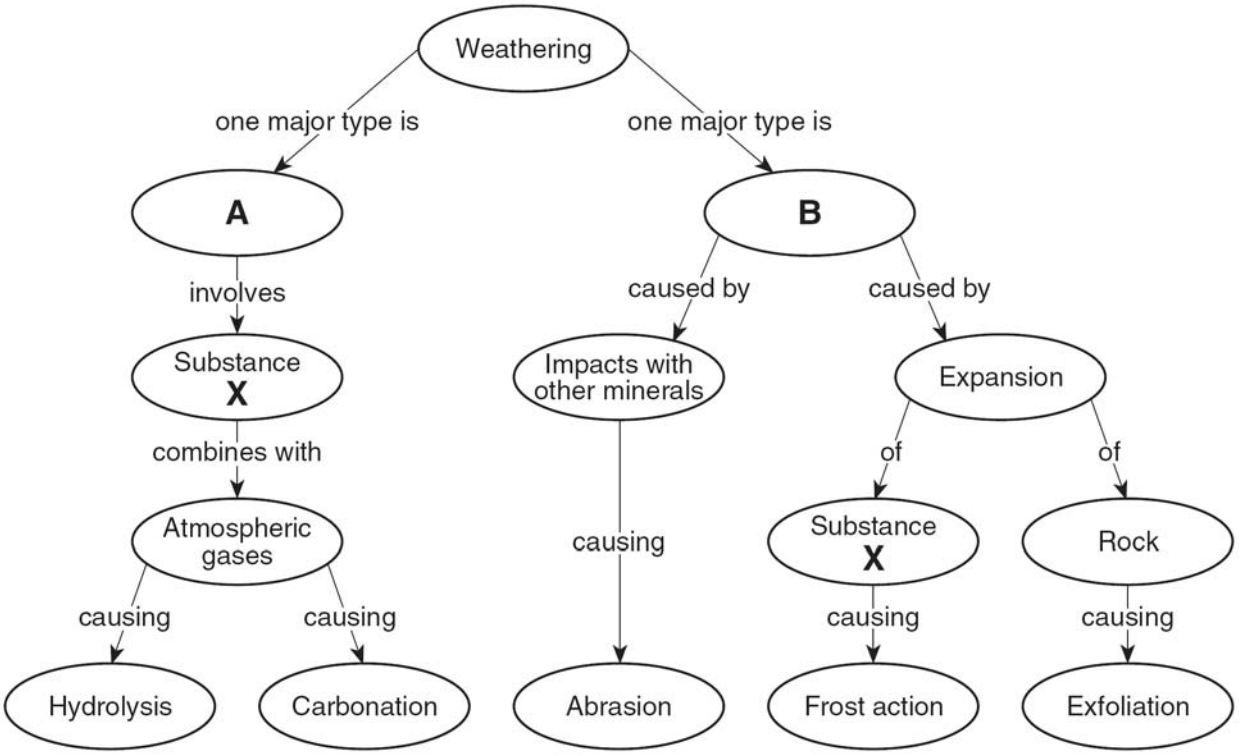
___12. The diagram below shows the stump of a tree whose root grew into a small crack in bedrock and split the rock apart.



The action of the root splitting the bedrock is an example of

(1) erosion (2) chemical weathering (3) physical weathering (4) deposition

Base your answers to questions **13** through **15** on flowchart below, which shows a general overview of the processes and substances involved in the weathering of rocks at Earth's surface. Letter *X* represents an important substance involved in both major types of weathering, labeled *A* and *B*on the flowchart. Some weathering processes are defined below the flowchart.



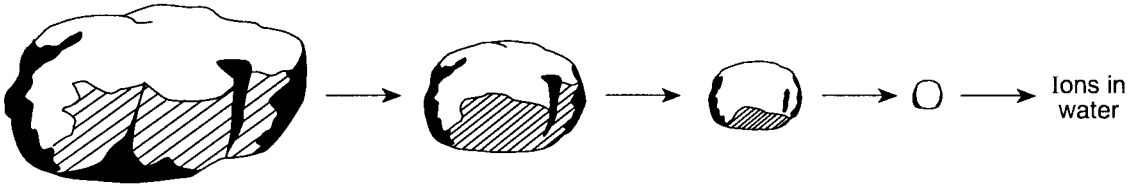
Definitions
Frost action – the breakup of rocks caused by the expansion of substance **X**
Abrasion – the wearing down of rocks or particles as they rub or bounce against other rocks
Exfoliation – the peeling away of large sheets of loosened material at the surface of a rock
Hydrolysis – the change in a material caused by contact with substance **X**
Carbonation – the change in a material caused by contact with carbonic acid

___13. Which weathering process is most common in a hot, dry environment?
(1) carbonation (2) hydrolysis (3) abrasion (4) frost action

___14. Which term best identifies the type of weathering represented by *A*?
(1) biological (2) glacial (3) physical (4) chemical

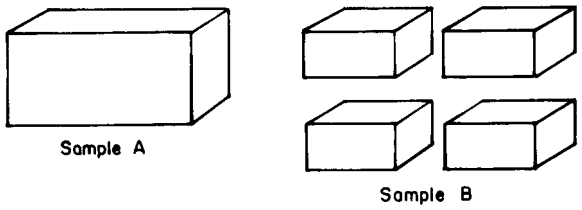
___15. Which substance is represented by *X* on both sides of the flowchart?
(1) air (2) hydrochloric acid (3) potassium feldspar (4) water

___16. The diagram below shows what happens to a rock within a stream's erosional-depositional system as time passes.



Which process of change is best represented by the sequence shown in the diagram?
(1) weathering (2) deposition (3) metamorphism (4) condensation

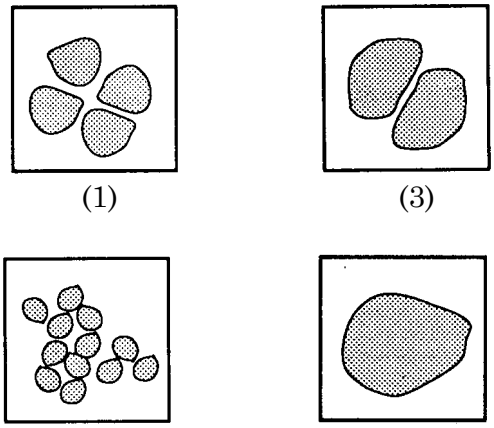
____17. The diagram below represents equal masses of two identical rock samples. Sample *A* is one large block, while sample *B* was cut into four smaller blocks of equal size.



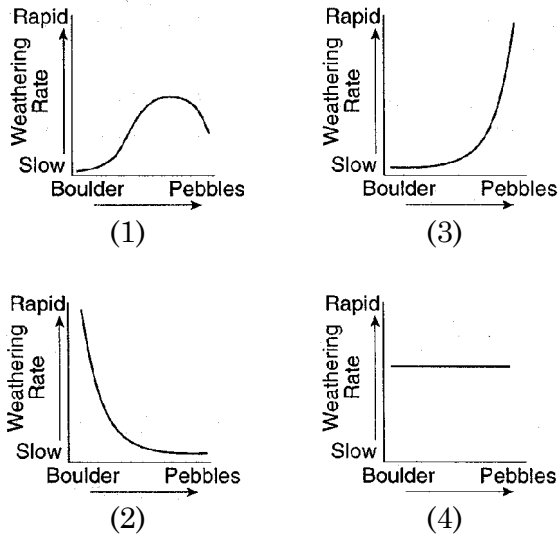
If subjected to the same environmental conditions, sample *B* will weather more quickly than sample *A*. The best explanation for this is that the
(1) hardness of sample *A* is greater than that of sample *B*
(2) density of sample *A* is greater than that of sample *B*
(3) volume of sample *B* is greater than that of sample *A*
(4) surface area of sample *B* is greater than that of sample *A*

____18. What occurs when a rock is crushed into a pile of fragments?
(1) The total surface area increases and chemical composition remains the same.
(2) The total surface area decreases and chemical composition remains the same.
(3) The total surface area decreases and chemical composition changes.
(4) The total surface area increases and chemical composition changes.

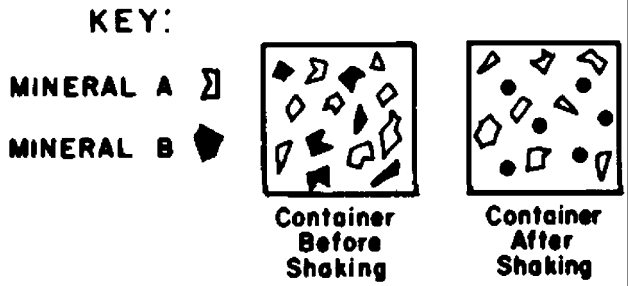
____19. The four limestone samples illustrated below have the same composition, mass, and volume. Under the same climatic conditions, which sample will weather fastest?



____20. Which graph best represents the chemical weathering rate of a limestone boulder as the boulder is broken into pebble-sized particles?

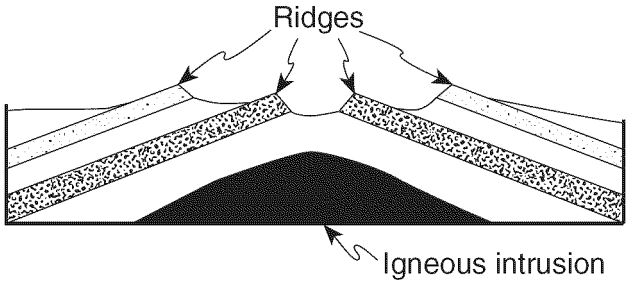


____21. Two different kinds of minerals, *A* and *B*, were placed in the same container and shaken for 15 minutes. The diagrams below represent the size and shape of the various pieces of mineral before and after shaking. What caused the resulting differences in shapes and sizes of the minerals?



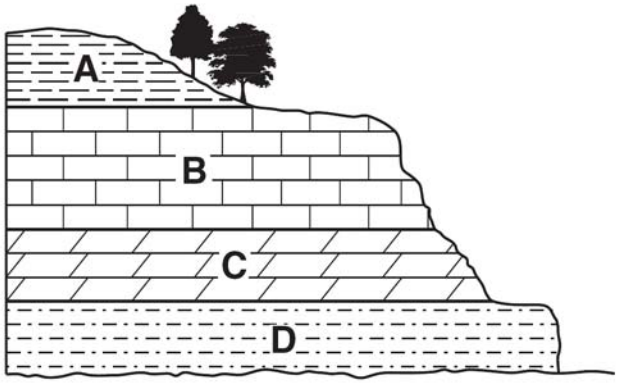
(1) Mineral *B* was shaken harder.
(2) Mineral *A* consisted of smaller pieces before shaking began.
(3) Mineral *B* had a glossy luster.
(4) Mineral *A* was more resistant to abrasion.

____22. The cross section below shows rock layers that underwent crustal movement during an igneous intrusion in the Cretaceous Period.



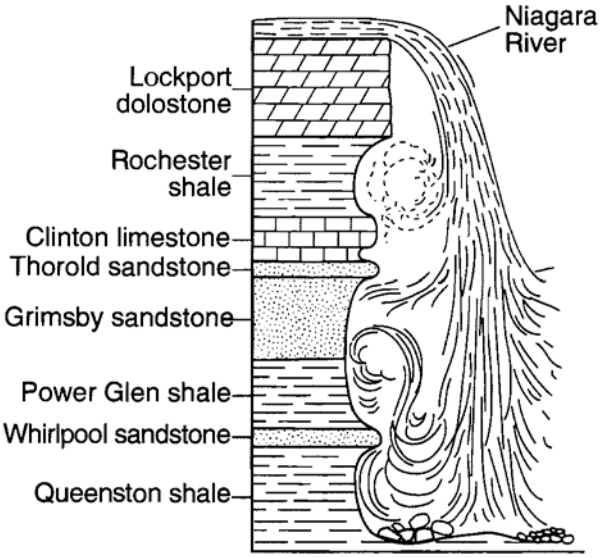
Which statement best describes the cause of the ridges shown?
(1) More deposition occurred at the ridge sites after uplift.
(2) The igneous intrusion flowed over the surface.
(3) Some rock layers were more resistant to weathering and erosion.
(4) The rock layers were evenly weathered.

____23. The cross section below shows sedimentary bedrock layers *A*, *B*, *C*, and *D* exposed at Earth's surface.



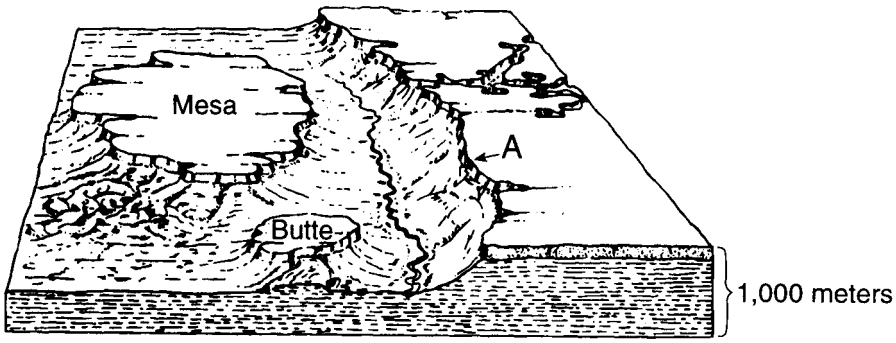
Which layer appears to be the *least* resistant to weathering?
(1) *D* (3) *A*
(2) *C* (4) *B*

____24. The generalized cross section below shows the sedimentary rock layers at Niagara Falls in western New York State.



Which rock layer appears to be most resistant to weathering and erosion?
(1) Rochester shale
(2) Lockport dolostone
(3) Grimsby sandstone
(4) Queenston shale

___25. Base your answer to the following question on the diagram below, which shows part of a landscape region. Letter *A* indicates a steep cliff formed at the edge of the surface rock layer.



Which statement best explains why the steep cliff formed at *A*?
(1) The surface layer was deposited as loose volcanic ash.
(2) The surface layer contains many fossils.
(3) The surface layer is more resistant to weathering than the other layers.
(4) The surface layer is older than the rock layers below.

Answer Key
EES - Weathering [Nov 16, 2011]

1. 3
2. 3
3. 3
4. 2
5. 4
6. 3
7. 3
8. 2
9. 2
10. 1
11. 1
12. 3
13. 3
14. 4
15. 4
16. 1
17. 4
18. 1
19. 2
20. 3
21. 4
22. 3
23. 3
24. 2
25. 3