WEATHERING REVIEW

1. The diagram below shows an outcrop of different layers of sandstone in a region receiving heavy rainfall.



Which sandstone layer appears to be the *least* resistant to weathering?

(1) <i>A</i>	(3) C
(2) <i>B</i>	(4) <i>L</i>

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

(3) volume (4) composition

- 3. Which event is an example of chemical weathering?
 - (1) rocks falling off the face of a steep cliff
 - (2) feldspar in granite being crushed into clay-sized particles
 - (3) water freezing in cracks in a roadside outcrop
 - (4) acid rain reacting with limestone bedrock
- 4. The diagram below shows some features in a cave.

Which type of rock was chemically weathered by acidic groundwater to produce the cave and its features?

- (1) siltstone (2) basalt
- (3) quartzite
- (4) limestone



Base your answers to questions 5 through 7 on the 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.



(1) physical (2) biological (3) chemical(4) glacial

- 6. Which substance is represented by X on both sides of the flowchart?
 (1) potassium feldspar
 (2) air
 (3) hydrochloric acid
 (4) water
- 7. Which weathering process is most common in a hot, dry environment?

(1) abrasion	(3) frost action
(2) carbonation	(4) hydrolysis

Base your answers to questions 8 and 9 on the graph below, which shows the effect that average yearly precipitation and temperature have on the type of weathering that will occur in a particular region.



- 8. Which type of weathering is most common where the average yearly temperature is 5°C and the average yearly precipitation is 45 cm?
 - (1) moderate chemical weathering
- (3) moderate chemical weathering with frost action

(2) very slight weathering

- (4) slight frost action
- 9. The amount of chemical weathering will increase if
 - (1) air temperature decreases and precipitation decreases
 - (2) air temperature decreases and precipitation increases
 - (3) air temperature increases and precipitation decreases
 - (4) air temperature increases and precipitation increases
- 10. The cross section 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) <i>A</i>	(3) C
(0) D	

(4) D (2) B



11. The cross section shows soil layer *X*, which was formed from underlying bedrock.

Which change would most likely cause soil layer *X* to increase in thickness?

- (1) a decrease in slope
- (2) a decrease in rainfall
- (3) an increase in biologic activity
- (4) an increase in air pressure



12. The diagram below shows four mineral samples, each having approximately the same mass.



If all four samples are placed together in a closed, dry container and shaken vigorously for 10 minutes, which mineral sample would experience the most abrasion?

- (1) quartz
- (2) amphibole

- (3) pyroxene
- (4) galena
- 13. Why are Precambrian gneiss cobbles and boulders commonly found on top of the surface bedrock in the Catskills?
 - (1) The surface bedrock of the Catskills is composed of Precambrian gneiss.
 - (2) The surface bedrock of the Catskills has been overturned.
 - (3) Many meteorites composed of gneiss have landed in the Catskills.
 - (4) Glaciers transported these rocks from the Adirondacks to the Catskills.
- 14. The cross section below shows layers of soil.



Which two processes produced the layer of dark brown to black soil?

- (1) melting and solidification of magma
- (3) weathering and biologic activity

(2) erosion and uplifting

(4) compaction and cementation

15. The cross section below shows the movement of wind-driven sand particles that strike a partly exposed basalt cobble located at the surface of a windy desert.



16. Four quartz samples of equal size and shape were placed in a stream. Which of the four quartz samples below has most likely been transported farthest in the stream?



17. The diagram below represents a naturally occurring geologic process.



 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) Lockport dolostone(2) Rochester shale
- (3) Grimsby sandstone
- (3) Grimsby sandslone
- (4) Queenston shale



- 19. The cross section below shows a soil profile.
 - This soil was formed primarily by
 - (1) erosion by glaciers
 - (2) erosion by running water
 - (3) capillarity and human activity
 - (4) weathering and biological activity



- 20. Chemical weathering occurs most rapidly in climates which are
 - 1 moist and warm
 - 2 moist and cold

- 3 dry and cold
- 4 dry and warm
- 21. Which change in the climate of New York State would most likely cause the greatest increase in chemical weathering of local bedrock?
 - 1 lower the temperature in winter
 - 2 lower humidity in winter

- 3 higher atmospheric pressure in summer
- 4 higher precipitation in summer
- 22. Water is a major agent of chemical weathering because water
 - 1 cools the surroundings when it evaporates
 - 2 dissolves many of the minerals that make up rocks
 - 3 has a density of about 1 gram per cubic centimeter
 - 4 has the highest specific heat of all common Earth materials

23. The principal cause of the chemical weathering of rocks on the Earth's surface is

2 decrease

- 1 rock abrasion
- 2 the heating and cooling of surface rock
- 3 mineral reactions with air and water
- 4 the expansion of water as it freezes
- 24. As particle size decreases, the rate of weathering will
 - 1 increase

3 remain the same

Base your answers to **questions 25 through 28** on your knowledge of Earth Science, the *Earth Science Reference Tables*, and the graph below which was prepared from the results of a study of four different types of cemetery stones. The graph shows the relationship between the ages of four cemetery stones and the percentage of each stone which had weathered away.



25. Which rock was found to have been exposed to weathering for the least number of years?

1	granite				3	marble
2	achiet			Ť	Λ	aandatan

2 schist 4 sandstone

26. In this study, which rock was most resistant to weathering?

1	marble	3	granite
2	schist	4	sandstone

27. What total percentage of the schist should have weathered away by the year 2020?

1	1.0%	3	0.5%	
2	2.0%	4	1.5%	

- 28. Studies have shown that pollutants added to the atmosphere in recent years are accumulating to cause an increase in the rate of weathering of marble. This factor should cause the line in the graph for marble in the future to
 - 1 increase in slope (curve upward)
 - 2 decrease in slope (curve downward)
 - 3 remain at the same slope