Unit 4: Landscapes Practice Problems

Name: _____ **Date:** _____

1. Soil with the greatest porosity has particles that are

   A. poorly sorted and densely packed

   B. poorly sorted and loosely packed

   C. well sorted and densely packed

   D. well sorted and loosely packed

2. Which factor has the most influence on the development of soil?

   A. climate

   B. longitude

   C. amount of rounded sediment

   D. slope of the landscape

3. In hot, wet climates, bedrock rapidly weathers into soil because water

   A. dissolves many minerals

   B. expands when it freezes

   C. is part of more chemical compounds

   D. cools the surroundings when it evaporates

4. Which soil-property measurement usually is greater when particles are fine than when particles are coarse?

   A. infiltration B. capillarity

   C. porosity D. permeability rate

5. Which climate conditions normally produce the greatest amount of chemical weathering?

   A. cool and dry B. cool and moist

   C. warm and dry D. warm and moist

6. Humus, which is formed by the decay of plant and animal matter, is important for the formation of most

   A. soils B. minerals

   C. sediment D. surface bedrock

7. Which type of climate has the greatest amount of rock weathering caused by frost action?

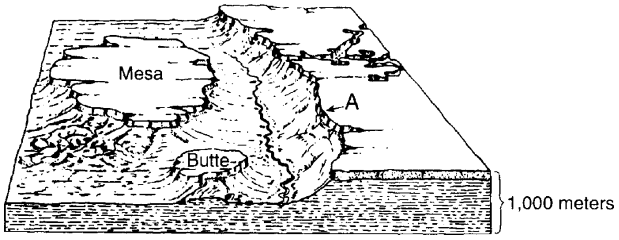
   A. a dry climate in which temperatures remain below freezing

   B. a dry climate in which temperatures alternate from below freezing to above freezing

   C. a wet climate in which temperatures remain below freezing

   D. a wet climate in which temperatures alternate from below freezing to above freezing

8. Base your answer(s) to the following question(s) 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*?

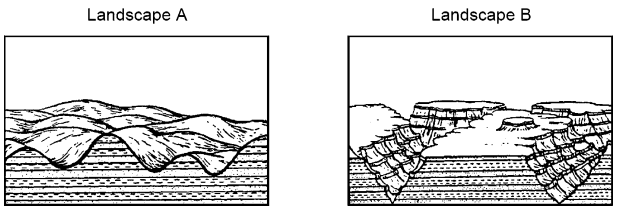
   A. The surface layer is older than the rock layers below.

   B. The surface layer was deposited as loose volcanic ash.

   C. The surface layer is more resistant to weathering than the other layers.

   D. The surface layer constains many fossils.

9. The accompanying diagram shows two landscape regions with similar bedrock type and structure.



Which statement best explains why these two landscape regions are different in appearance?

A. Landscape *A* formed in a humid region, and landscape *B* formed in a dry region.

B. Landscape *A* formed in a humid region, and landscape *B* formed in a glaciated region.

C. Landscape *A* formed in a dry region, and landscape *B* formed in a glaciated region.

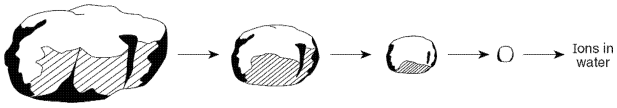
D. Landscape *A* formed in a dry region, and landscape *B* formed in a humid region.

10. Through which of the following loose soil materials does water infiltrate fastest?

A. clay B. silt

C. sand D. pebbles

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

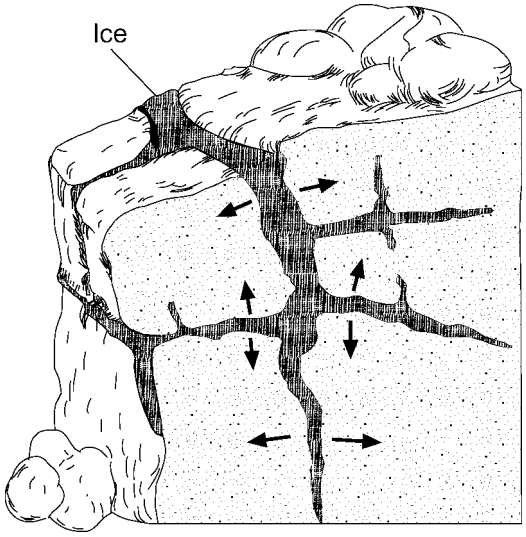


Which process of change is best represented by the sequence shown in the diagram?

A. deposition B. metamorphism

C. condensation D. weathering

12. The accompanying diagram shows granite bedrock with cracks. Water has seeped into the cracks and frozen. The arrows represent the directions in which the cracks have widened due to weathering.



Which statement best describes the physical weathering shown by the diagram?

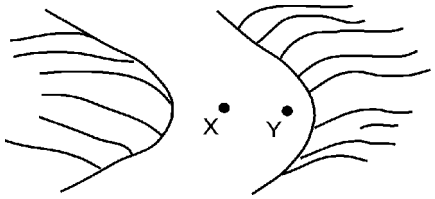
A. Enlargement of the cracks occurs because water expands when it freezes.

B. This type of weathering occurs only in bedrock composed of granite.

C. The cracks become wider because of chemical reactions between water and the rock.

D. This type of weathering is common in regions of primarily warm and humid climates.

13. The diagram shows a stream flowing past points *X* and *Y*. If the velocity of the stream at point *X* is 100 centimeters per second, which statement best describes the sediments being transported past these points?



A. At points *X* and *Y*, only clay is being transported.

B. At points *X* and *Y*, only sand, silt, and clay are being transported.

C. Some pebbles being transported at point *Y* are bigger than those being transported at point *X*.

D. Some pebbles and cobbles are being transported at points *X* and *Y*, but not sand, silt, or clay.

14. Which activity demonstrates chemical weathering?

A. freezing of water in the cracks of a sandstone sidewalk

B. abrasion of a streambed by tumbling rocks

C. grinding of talc into a powder

D. dissolving of limestone by acid rain

15. Unsorted, angular, rough-surfaced cobbles and boulders are found at the base of a cliff. What most likely transported these cobbles and boulders?

A. running water B. wind

C. gravity D. ocean currents

16. The greatest amount of rainwater infiltration occurs on the side of a hill if the surface of a permeable soil has

A. small soil particles and a steep slope

B. small soil particles and a gentle slope

C. large soil particles and a steep slope

D. large soil particles and a gentle slope

17. Which surface soil conditions allow the most infiltration of rainwater?

A. steep slope and permeable soil

B. steep slope and impermeable soil

C. gentle slope and permeable soil

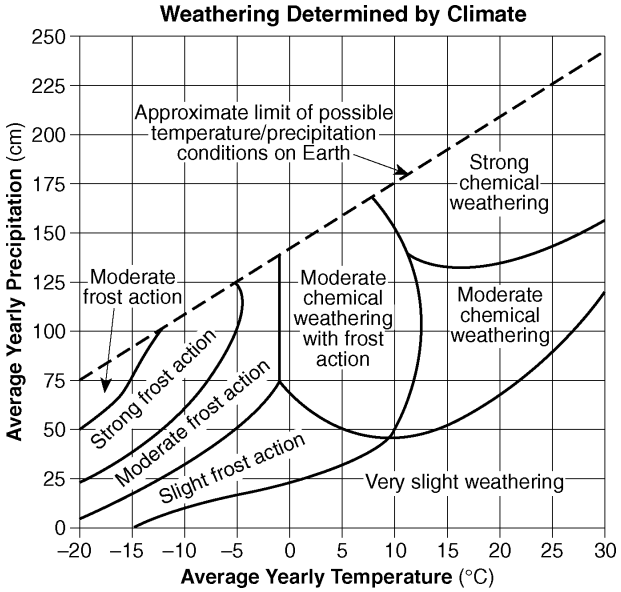
D. gentle slope and impermeable soil

18. Which surface soil type has the *slowest* permeability rate and is most likely to produce flooding?

A. pebbles B. sand

C. silt D. clay

19. Base your answer(s) to the following question(s) 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.



Which type of weathering is most common where the average yearly temperature is 5°C and the average yearly precipitation is 45 cm?

A. moderate chemical weathering

B. very slight weathering

C. moderate chemical weathering with frost action

D. slight frost action

20. The amount of chemical weathering will increase if

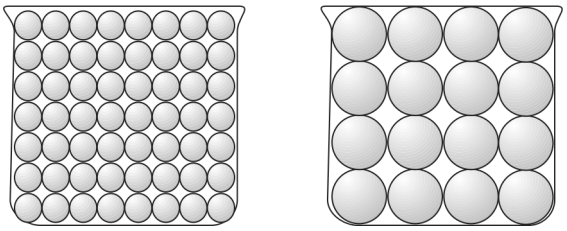
A. air temperature decreases and precipitation decreases

B. air temperature decreases and precipitation increases

C. air temperature increases and precipitation decreases

D. air temperature increases and precipitation increases

21. The diagram below shows two identical containers filled with uniform particles that were sorted by size.

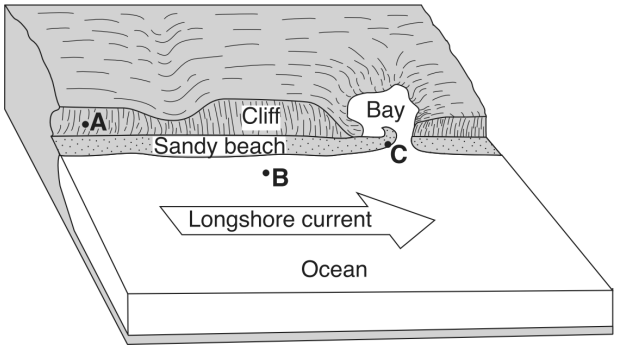


Which characteristic is most likely the same for these particle-filled containers?

A. infiltration rate B. water retention

C. capillarity D. porosity

22. The block diagram below shows a part of the eastern coastline of North America. Points A, B, and C are reference points along the coast.



Which list best represents the primary processes occurring along the coastline at points A, B, and C?

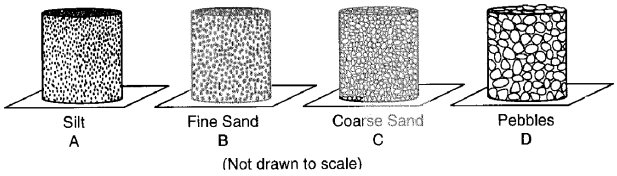
A. A — folding; B — subduction; C — crosscutting

B. A — weathering; B — erosion; C — deposition

C. A — faulting; B — conduction; C — mass movement

D. A — precipitation; B — infiltration; C — evaporation

23. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables* and the diagrams below. The diagrams represent 500-milliliter containers that are open at the top and the bottom and filled with well-sorted, loosely packed particles of uniform size. A piece of screening placed at the bottom of each container prevents the particles from falling out.



The sample in which container would have the greatest capillarity when placed in water?

A. *A* B. *B* C. *C* D. *D*

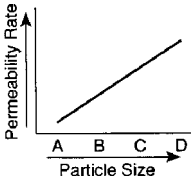
24. Assume that the samples in each container were taken from surface soil in different locations. Which location would produce the *least* amount of runoff during a heavy rainfall?

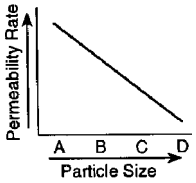
A. *A* B. *B* C. *C* D. *D*

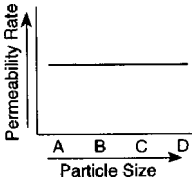
25. The sample in which container would retain the most water on the particles after 500 milliliters of water is poured through the sample?

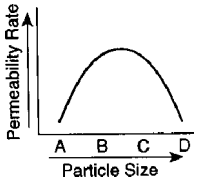
A. *A* B. *B* C. *C* D. *D*

26. Which graph best represents the rate of permeability of the samples?

A.


B.


C.


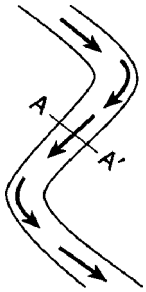
D.


27. Container *A* is filled with particles that could have a diameter of

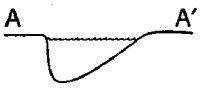
A. 0.0001 cm B. 0.001 cm

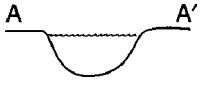
C. 0.01 cm D. 0.1 cm

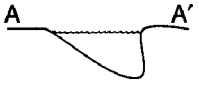
28. The diagram below is a map view of a stream flowing through an area of loose sediments. Arrows show the location of the strongest current.

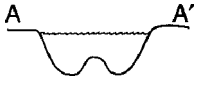


Which stream profile best represents the cross section from *A* to *A'*?

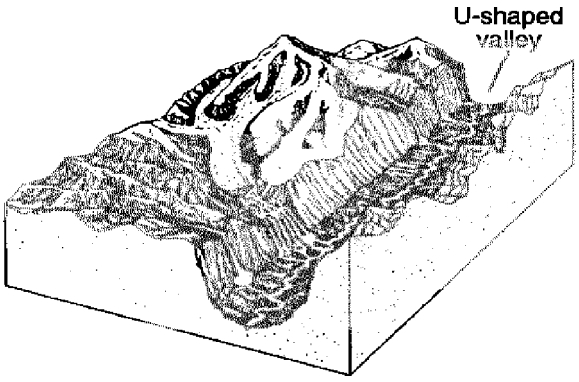
A.


B.


C.


D.


29. The diagram below represents a landscape area.

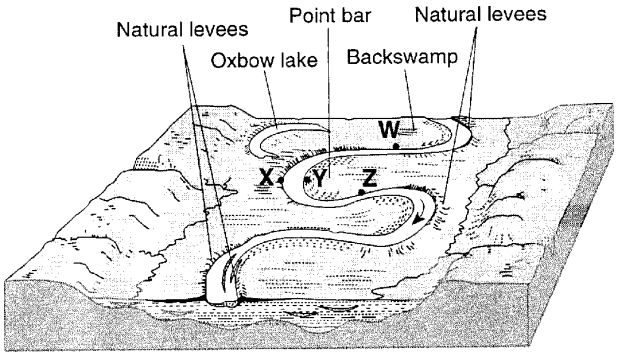


The main valley in this landscape area resulted mostly from

A. chemical weathering B. volcanic activity

C. glacial erosion D. stream erosion

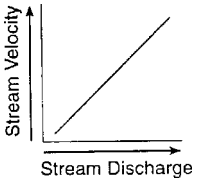
30. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables*, the diagram below, and your knowledge of Earth science. The diagram represents the landscape features associated with a meandering stream. Points *W*, *X*, *Y*, and *Z* are locations along the stream bank.

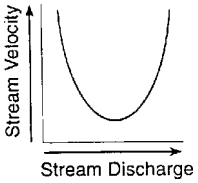


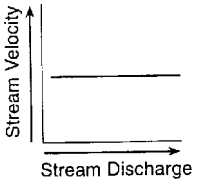
At which location is erosion greatest?

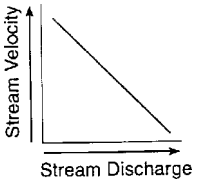
A. *W* B. *X* C. *Y* D. *Z*

31. Which graph shows how the changes in stream discharge usually affect stream velocity?

A. 

B. 

C. 

D. 

32. Unsorted piles of angular sediments were most likely transported and deposited by

A. wind
B. glaciers
C. ocean waves
D. running water

33. Which evidence best indicates that a landscape has been eroded primarily by streams?

A. parallel sets of U-shaped valleys
B. sand dunes
C. thick residual soil
D. sorted layers of cobbles and sand

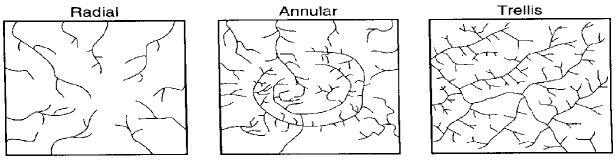
34. The percentage of open space between grains of soil is called the soil's

A. permeability
B. porosity
C. discharge
D. capillarity

35. What is the largest particle that can generally be transported by a stream moving at 200 centimeters per second?

A. boulder
B. cobble
C. pebble
D. sand

36. The accompanying maps represent three different stream drainage patterns.



Which statement is generally true of these three drainage patterns?

A. All are controlled by underlying bedrock structure.
B. All are in the old-age stage of stream development.
C. All are located in semiarid regions.
D. All are located in areas where deposition is greater than erosion.

37. A decrease in a river's velocity will most likely result in more

A. erosion by the river
B. deposition within the river
C. large particles being carried by the river
D. dissolved material being picked up by the river

38. A group of students observed and measured various characteristics of a stream for one day. Which statement about the stream is most likely an inference?

A. The stream water is dark brown.
B. The water level of the stream will rise after the next rainfall.
C. The velocity of the stream is greatest near the outside of a meander.
D. The stream's depth is different at various distances from the streambank.

39. In a region that is being uplifted faster than it is being eroded, hills usually have

A. steep slopes and fast-moving streams
B. steep slopes and slow-moving streams
C. gentle slopes and fast-moving streams
D. gentle slopes and slow-moving streams

40. What is the best evidence that a glacial erratic has been transported?

A. It is located at a high elevation in a mountainous area.

B. It is less than 25 centimeters in diameter.

C. Its composition is different from that of the bedrock under it.

D. It appears to have been intensely metamorphosed.

41. Which condition causes glaciers to retreat?

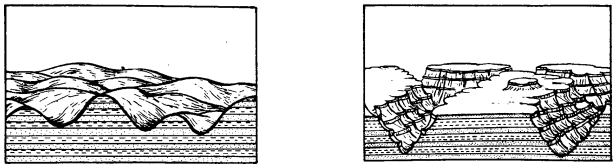
A. They encounter the ocean.

B. The crust beneath them is uplifted.

C. Earth's average temperature decreases.

D. Their rate of melting exceeds their rate of advancing.

42. The accompanying diagrams represent two different plateaus.



Which factor was probably most important in causing one plateau to develop smooth, rounded surface features and the other plateau to develop sharp, angular surface features?

A. type of bedrock B. amount of folding

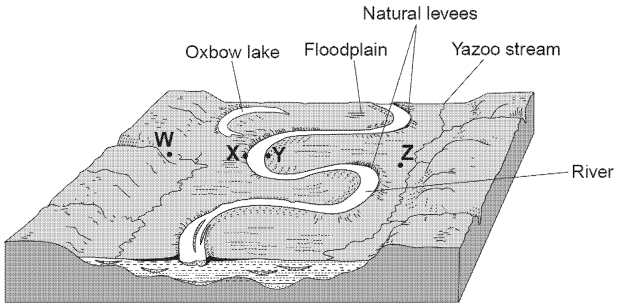
C. time D. climate

43. As the velocity of a stream decreases, the amount of sediment in the water of the stream

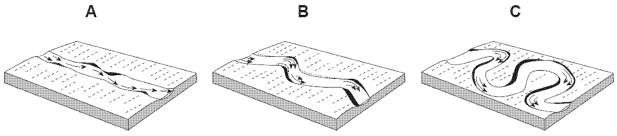
A. decreases B. increases

C. remains the same

44. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables*, the diagram below, and your knowledge of Earth science. The diagram represents the landscape features associated with a meandering river. Letters *W*, *X*, *Y*, and *Z* represent locations on the floodplain.



The accompanying diagram represents stages in the formation of this meandering river.



Which sequence best represents the usual changes over time?

A. A → B → C B. A → C → B

C. C → A → B D. C → B → A

45. At which location is erosion greatest?

A. *W* B. *X* C. *Y* D. *Z*

46. The natural levees are ridges of sediment that slope away from the riverbank toward the floodplain. Which process most likely formed these levees?

A. weathering of the soil on the riverbanks

B. erosion on the inside curves of the meanders

C. deposition by the yazoo stream

D. deposition when the river overflowed its banks

47. During transport by this river, a sediment particle will most likely become

A. more rounded B. more dense

C. heavier D. larger

48. Which change would most likely increase the velocity of the river?

A. a decrease in the slope of the river

B. a decrease in the temperature of the river

C. an increase in the river's discharge

D. an increase in the width of the river

49. Two streams begin at the same elevation and have equal volumes. Which statement best explains why one stream could be flowing faster than the other stream?

A. The faster stream contains more dissolved minerals.

B. The faster stream has a much steeper gradient.

C. The streams are flowing in different directions.

D. The faster stream has a temperature of 10° C, and the slower stream has a temperature of 20° C.

50. The long, sandy islands along the south shore of Long Island are composed mostly of sand and rounded pebbles arranged in sorted layers. The agent of erosion that most likely shaped and sorted the sand and pebbles while transporting them to their island location was

A. glaciers B. landslides

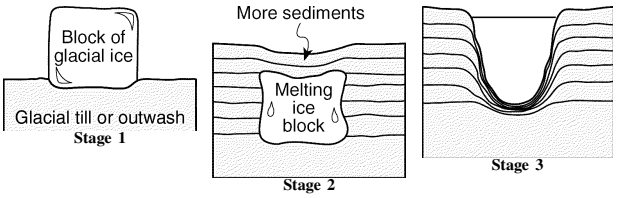
C. wind D. ocean waves

51. What are the largest particles that a stream can transport when its velocity is 200 centimeters per second?

A. silt B. sand

C. pebbles D. cobbles

52. The cross sections below show a three-stage sequence in the development of a glacial feature.



Which glacial feature has formed by the end of stage 3?

A. kettle lake B. finger lake

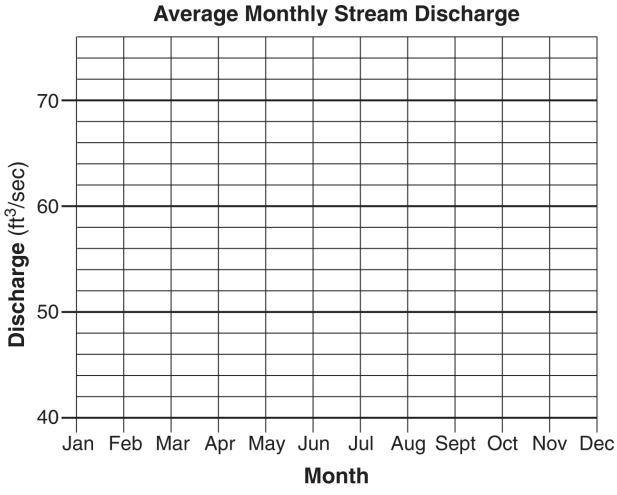
C. drumlin D. parallel scratches

53. Base your answer(s) to the following question(s) on the data table below and on your knowledge of Earth science. The data table shows the average monthly discharge, in cubic feet per second, for a stream in New York State.

Data Table

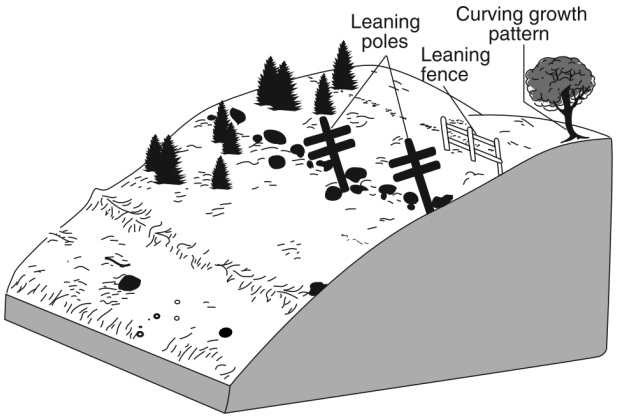
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Discharge (ft3/sec)	48	52	59	66	62	70	72	59	55	42	47	53

On the grid below, plot with an **X** the average stream discharge for *each* month shown in the data table. Connect the **X**s with a line.



54. Explain *one* possible reason why this stream's discharge in April is usually greater than this stream's discharge in January.

55. The diagram below shows the surface features of a landscape.



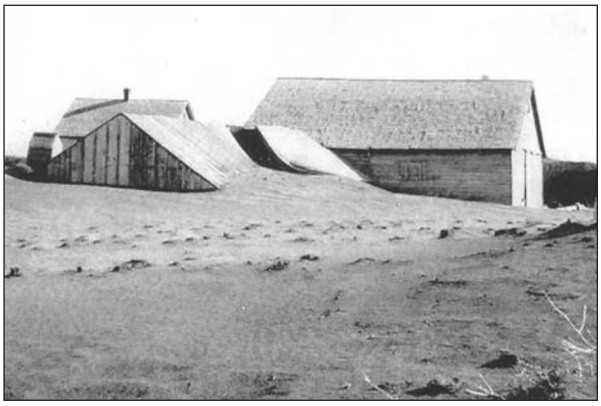
Based on the features shown, which erosional agent had the greatest effect on tree growth and the structures that humans have built on this landscape?

A. running water
B. moving ice
C. prevailing wind
D. mass movement

56. Which natural agent of erosion is mainly responsible for the formation of the barrier islands along the southern coast of Long Island, New York?

A. mass movement
B. running water
C. prevailing winds
D. ocean waves

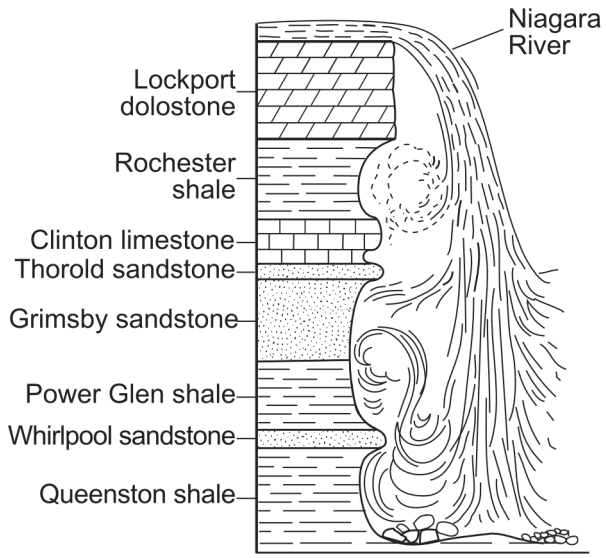
57. The photograph below shows farm buildings partially buried in silt.



Which erosional agent most likely piled the silt against these buildings?

A. glacial ice
B. ocean waves
C. wind
D. mass movement

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



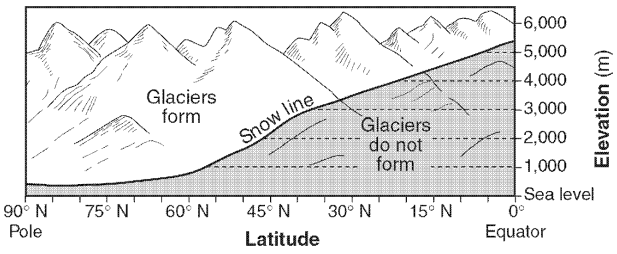
Which rock layer appears to be most resistant to weathering and erosion?

A. Lockport dolostone
B. Rochester shale
C. Grimsby sandstone
D. Queenston shale

59. Which geologic processes produced the present surface landscape features of most New York State landscapes?

A. crustal movement and erosion
B. subsidence and metamorphism
C. faulting and folding
D. volcanism and igneous activity

60. The accompanying graph shows the snow line (the elevation above which glaciers form at different latitudes in the Northern Hemisphere).



At which location would a glacier most likely form?

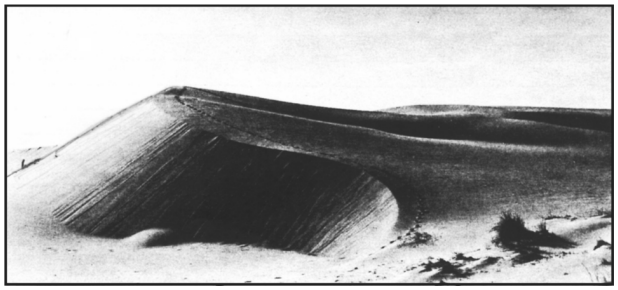
A. 0° latitude at an elevation of 6,000 m

B. 15° N latitude at an elevation of 4,000 m

C. 30° N latitude at an elevation of 3,000 m

D. 45° N latitude at an elevation of 1,000 m

61. The photograph below shows a sand dune that formed in a coastal area.



This sand dune was most likely formed by

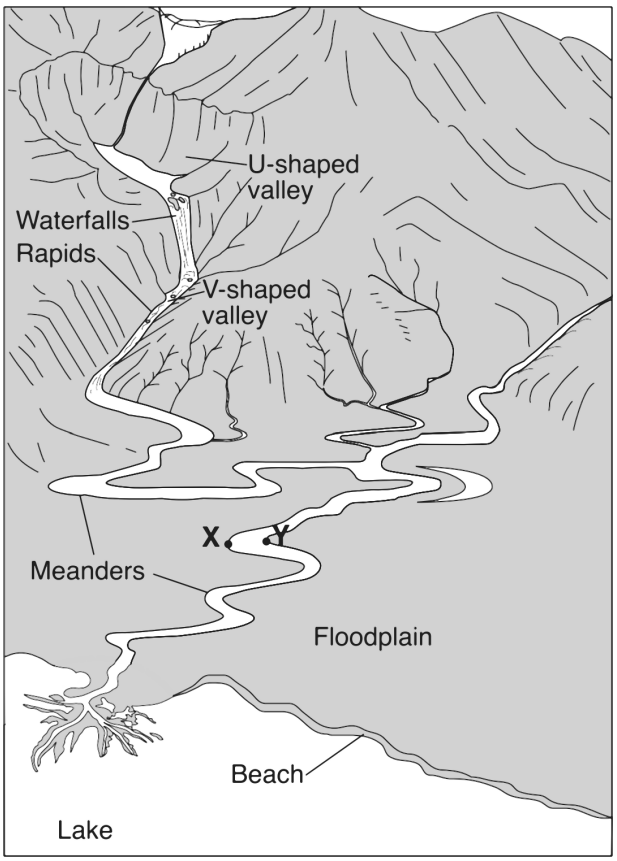
A. water flowing from the left

B. water flowing from the right

C. wind blowing from the left

D. wind blowing from the right

62. Base your answer(s) to the following question(s) on the diagram below, which shows several different landscape features. Points X and Y indicate locations on the streambank.



Explain why the upper valley in the mountains is U-shaped and the lower valley is V-shaped.

63. Identify which point, X or Y, has more stream erosion and explain why the amounts of erosion are different.

64. Explain why the stream meanders on the floodplain, but *not* in the mountains.

65. The beach consists of particles with diameters from 0.01 cm to 0.1 cm. Identify the sedimentary rock that will form when burial and cementation of these sediments occur.

66. Where is the most deposition likely to occur?

A. on the side of a sand dune facing the wind

B. at the mouth of a river, where it enters an ocean

C. at a site where glacial ice scrapes bedrock

D. at the top of a steep slope in a streambed

67. A sedimentary deposit produced by wind erosion is most likely composed of

A. sorted fine-grained particles in cross-bedded layers

B. a range of particle sizes from 1.0 to 10.0 cm in diameter think layers

C. flat, angular boulders in unsorted piles

D. shells of varying size, shape, and composition in isolated mounds

68. A sedimentary particle is dropped into a cylinder of water. The particle will take the longest time to settle if the particle has

A. low density, small size, and spherical shape

B. low density, small size, and flattened shape

C. high density, large size, and spherical shape

D. high density, large size, and flattened shape