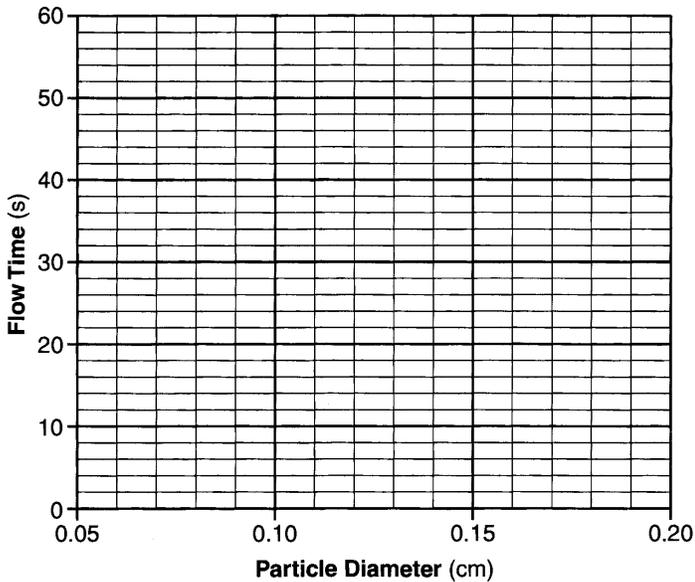1. Base your answer to the following question on the data table below. Six identical cylinders, *A* through *F*, were filled with equal volumes of sorted spherical particles. The data table shows the particle diameters, in centimeters, and the amount of time, in seconds, for water to flow equal distances through each cylinder.

Data Table

Cylinder	Particle Diameter (cm)	Flow Time (s)
A	0.07	51
B	0.08	39
C	0.10	25
D	0.14	13
E	0.16	10
F	0.18	8

Use the information in the data table to construct a line graph. On the grid *in your answer booklet,* plot the data for the flow time for each of the particle sizes given in the data table. Connect the plotted data with a smooth, curved line.
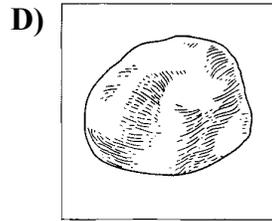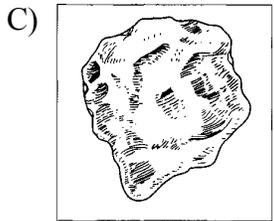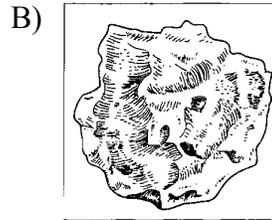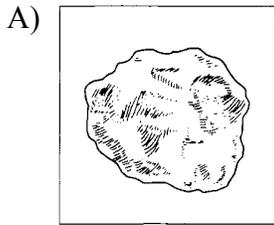
2. Base your answer to the following question on the block diagram below, which represents the landscape features associated with a meandering stream. *WX* is the location of a cross section. Location *A* indicates a landscape feature.
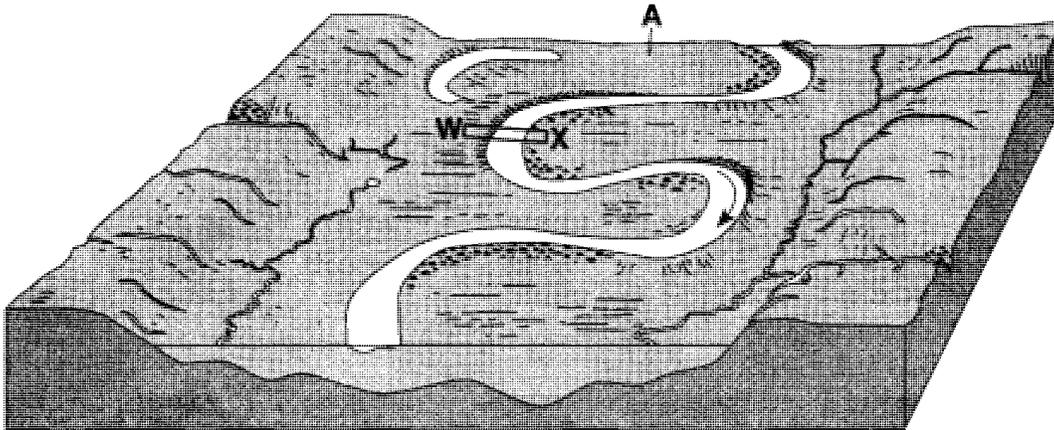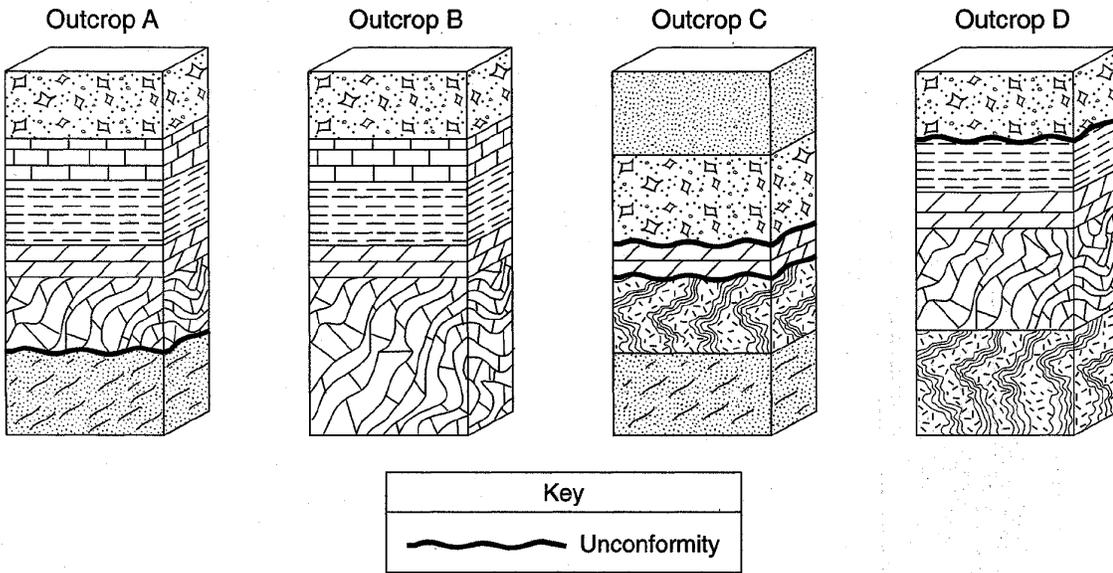

(Not drawn to scale)

Which particle of quartz shows evidence of being transported the farthest distance by the stream?
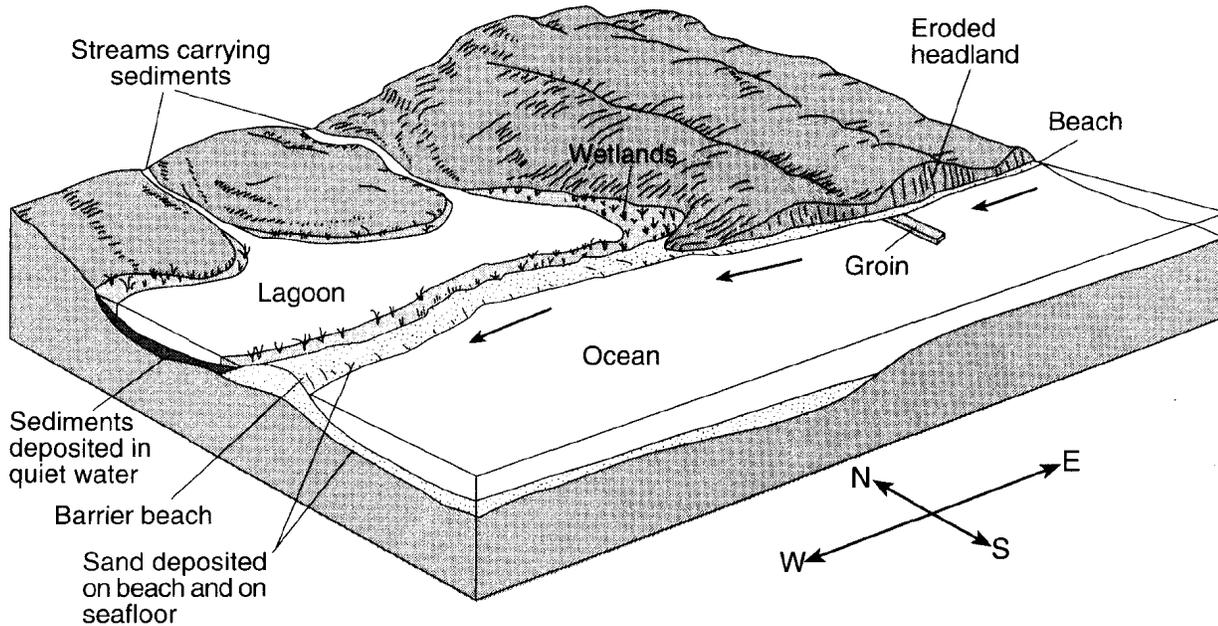
A)

B)

C)

D)

3. Base your answer to the following question on the block diagrams of four rock outcrops, *A, B, C,* and *D,* located within 15 kilometers of each other. The rock layers have not been overturned.

Key

~~~~~~ Unconformity

Which stream velocity carried only clay particles to the depositional environment where the shale formed?

A) 0.02 cm/s   B) 0.05 cm/s   C) 10 cm/s   D) 20 cm/s

4. Base your answer to the following question on the diagram below. The arrows show the direction in which sediment is being transported along the shoreline. A barrier beach has formed, creating a lagoon (a shallow body of water in which sediments are being deposited). The eroded headlands are composed of diorite bedrock. A groin has recently been constructed. Groins are wall-like structures built into the water perpendicular to the shoreline to trap beach sand.

The sediments that have been deposited by streams flowing into the lagoon are most likely

A) sorted and layered   B) sorted and not layered
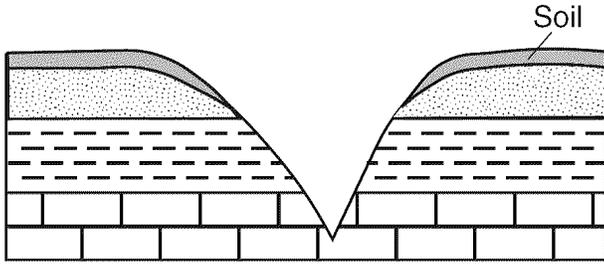C) unsorted and layered   D) unsorted and not layered

5. Which property would best distinguish sediment deposited by a river from sediment deposited by a glacier?

   A) mineral composition of the sediment
   B) amount of sediment sorting
   C) thickness of sediment layers
   D) age of fossils found in the sediment

6. Which change at a particular location in a stream usually causes more sediments to be deposited at that location?

   A) decrease in stream velocity
   B) decrease in stream width
   C) increase in stream slope
   D) increase in stream discharge

7. Which statement best describes sediments deposited by glaciers and rivers?

   A) Glacial deposits and river deposits are both sorted.
   B) Glacial deposits are sorted, and river deposits are unsorted.
   C) Glacial deposits are unsorted, and river deposits are sorted.
   D) Glacial deposits and river deposits are both unsorted.

8. Base your answer to the following question on the photograph below, which shows a mountainous region cut by a large valley in its center.

What characteristic of this large valley supports the inference that glacial ice formed the valley?
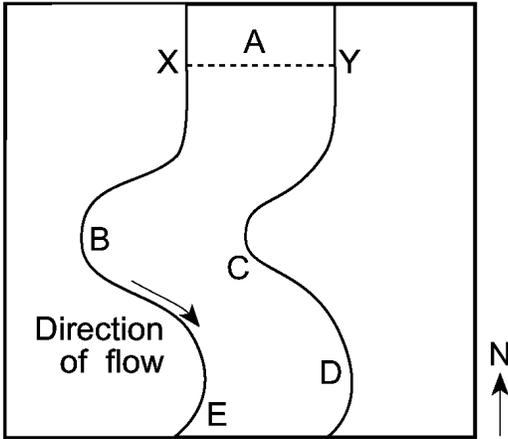
9. The cross section below shows a V-shaped valley and the bedrock beneath the valley.

Which agent of erosion is responsible for cutting most V-shaped valleys into bedrock?

A) surface winds   **B) running water**

C) glacial ice   D) ocean waves

10. Base your answer to the following question on the map below, which shows a portion of a stream that flows southward. Letters *A* through *E* represent locations in the stream. Line *XY* is the location of a cross section.
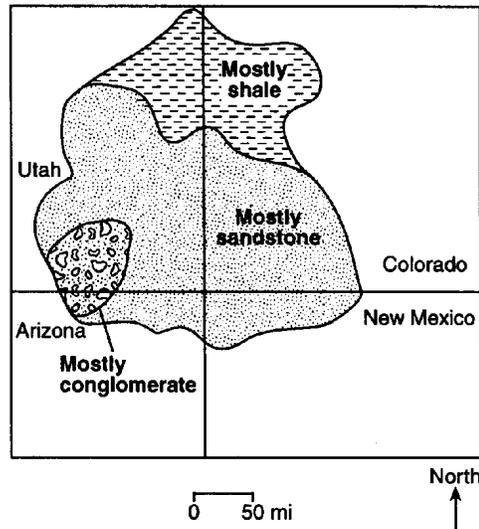

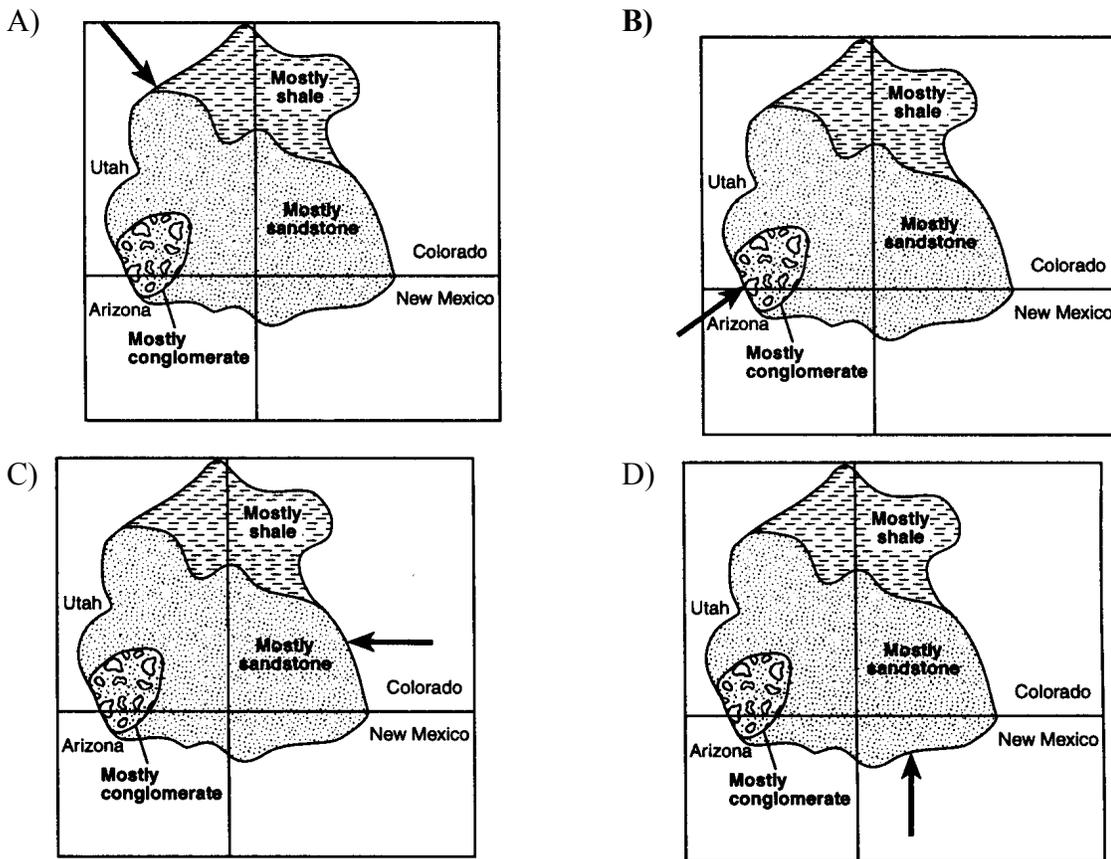At which two locations in this stream is deposition normally dominant over erosion?

A) *A* and *D*   B) *B* and *E*

C) *C* and *E*   D) *D* and *C*

11. 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

12. The map below shows the surface bedrock in an area of the southwestern United States that formed from sediments deposited in a shallow sea that formerly existed in that area. These sediments were transported by a river that flowed into the sea.

In which diagram does the arrow best show the direction of flow of the river that deposited these sediments and the point at which the river emptied into the sea?

A)

B)

C)

D)

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13. Which landscape feature is most likely to be formed from a bedrock layer that is resistant to erosion?
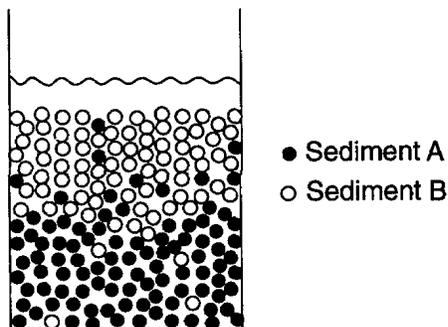
A) coastal plain   B) glacial moraine

C) valley   **D) cliff**

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

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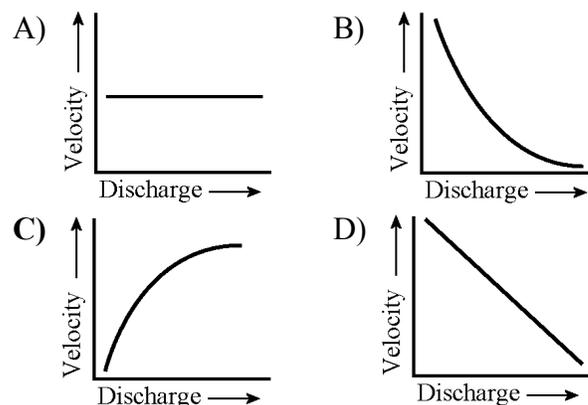
C) cobble   D) boulder

15. In which type of landscape are meandering streams most likely found?

    A) regions of waterfalls
    B) gently sloping plains
    C) steeply sloping hills
    D) V-shaped valleys

16. 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

17. Which landscape region is a flat plain consisting mainly of unsorted clays, gravels, sands, scratched pebbles, boulders, and cobbles?

    A) the Adirondacks   **B) Long Island**
    C) the Catskills   D) the Taconics

18. Particles of sediment *A* and sediment *B* were mixed in a container of water. They settled in the pattern shown in the diagram below.
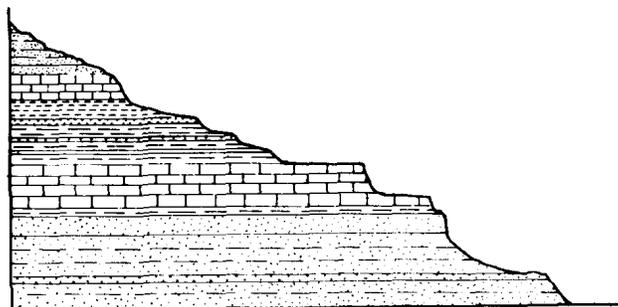

    • Sediment A
    ○ Sediment B

    The pattern indicates that, compared to particles of sediment *B*, particles of sediment *A* have a

    A) smaller volume   **B) greater density**
    C) smaller volume   D) rougher texture

19. Which change is most likely to occur in a landscape region that is uplifted rapidly by folding?

    A) The climate will become warmer.
    B) The stream drainage patterns will change.
    C) The composition of the bedrock will change.
    D) The hillslopes will become less steep.

20. Stream velocity and stream discharge were recorded continuously at the same location in a stream channel. Which graph best shows the relationship between stream velocity and stream discharge at this location?

21. Humans can cause rapid changes in the environment, which may produce catastrophic events. Which statement below is the best example of this concept?

    A) Mountainside highway construction causes a landslide.
    B) Lightning causes a forest fire.
    C) Shifting crustal plates cause an earthquake.
    D) Changing seasonal winds cause flooding in an area.

22. A local landscape can be changed most in the shortest amount of time by

    A) activities of humans
    B) wind erosion
    C) physical weathering
    D) a changing climate

23. The diagram below represents a cross section of a series of horizontal sedimentary rock layers.
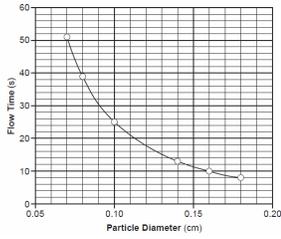

    The variation in the steepness of the eroded hillslopes in the diagram is most likely due to the

    A) resistance of the rock layers
    B) thickness of the rock layers
    C) tilt of the rock layers
    D) age of the rock layers

1.

2. **D**

3. **A**

4. **A**

5. **B**

6. **A**

7. **C**

8. • The valley has a U-shaped cross section. • The bottom of the valley is round. • Nonglaciated mountain valleys are V-shaped; this one is U-shaped.

9. **B**

10. **C**

11. **B**

12. **B**

13. **D**

14. **C**

15. **B**

16. **D**

17. **B**

18. **B**

19. **B**

20. **C**

21. **A**

22. **A**

23. **A**