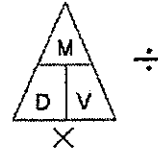


## THE 50 WAYS TO PASS THE EARTH SCIENCE MIDTERM

1. Density is / how close or compact the molecules are
2. As temperature increases / density decreases (molecules spread out) and volume increases (that is why heat rises!)
3. The same objects have the / same density NO MATTER WHAT SIZE
4. Density triangle / cover up the variable you want to solve for:



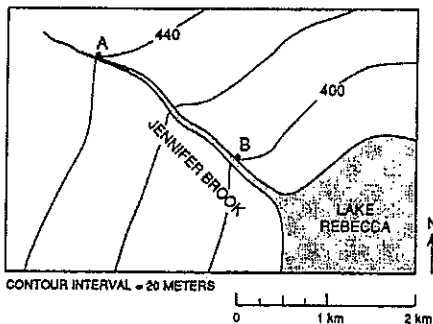
5. Latitude lines are drawn / horizontal, but measure **north – south** of Equator (latitude = flatitude)
6. Longitude lines are drawn / vertical, but measure **east – west** of Prime meridian
7. The altitude of Polaris equals / your latitude (be able to use NYS map to find altitude)
8. A set of circles inside circles indicates / a hill
9. To get the highest possible elevation / subtract one from the next possible contour line
10. Tick marks mean / depressions; the first tick marked line is the same elevation as the one next to it
11. Contour interval is the / amount between each contour line; Ocean is sea level 0'
12. Lines close together mean / steeper gradient
13. Water flows / downhill; opposite the bends (“V”) in contour lines (they point upstream)
14. The physical properties of minerals depends upon / the internal arrangement of atoms
15. Color is not a good way to ID a mineral because / some minerals come in lots of colors like quartz
16. Cleavage is / the flat sides on a mineral, mineral breaks along planes of weak bonding
17. The mineral and rock that react to acid are / calcite (rhombus-shaped) and limestone
18. The most abundant minerals in Earth’s crust are / oxygen and silicon (ESRT p.1)
19. Rocks are classified on the basis of / their origin (how they formed)
20. Sedimentary rocks form from / sediments by compaction & cementation, evaporation, and organic remains
  - Texture / clastic (pieces of other rocks)
  - / Fossils!!!
21. Igneous rocks form by / the crystallization of molten magma or lava (intergrown crystals)
  - Large crystals / slow cooling (Intrusive)
  - Small crystals / fast cooling (Extrusive)
  - Texture / glassy, fine, and coarse
22. Vesicular means / gas pockets (cooled fast, extrusive, volcanic)
23. Crystal size in igneous rocks depends on / the rate of cooling

## Formula Questions

1. A cube is 3 cm on a side. Its mass is 67.5g, what is its density? (Show work) \_\_\_\_\_ g/cm<sup>3</sup>
2. A rectangle has a length of 3 cm, a width of 2 cm, and height of 1 cm. It has a mass of 120 grams. What is its density?
3. A rectangle has a volume of 40 cm<sup>3</sup>. It has a density of 3 gm/cc. Calculate its mass.
4. A cube has a mass of 128 grams and a density of 2 gm/cc. Find the volume.
5. Between 6 A.M. and 11 A.M., the temperature inside a greenhouse rose from 13°C to 20°C. Calculate the rate of temperature change inside the greenhouse. (Show work)

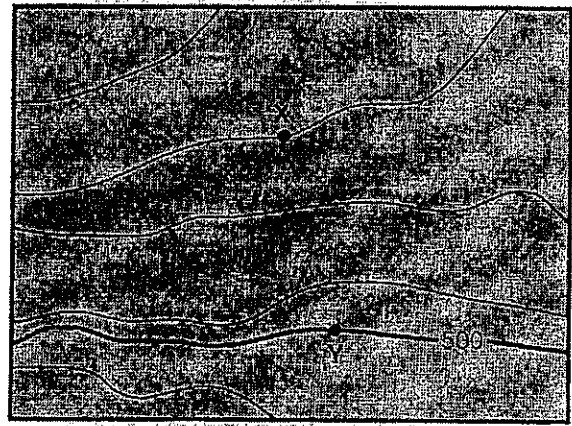
6. On the contour map below, calculate the gradient of this stream from points A to B.

(Show work) \_\_\_\_\_ m/km

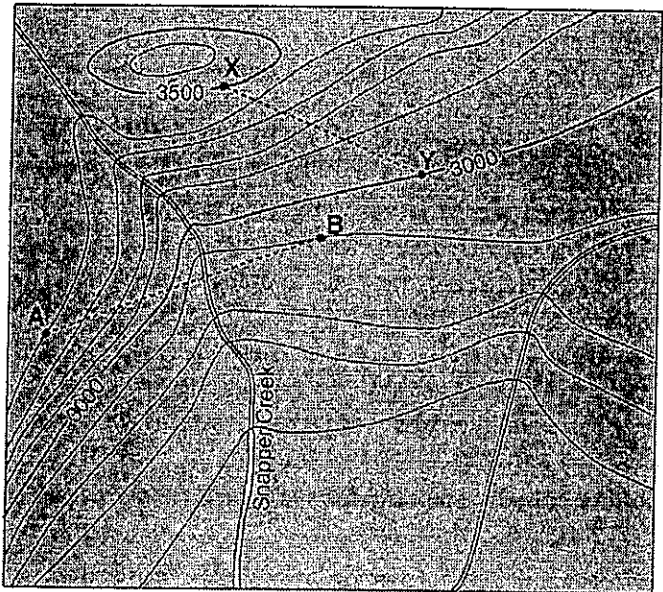


4. \_\_\_\_\_ What is the approximate gradient between X and Y?

- (1) 15 ft/mi
- (2) 20 ft/mi
- (3) 30 ft/mi
- (4) 60 ft/mi



Scale of Miles      Contour interval: 20 feet  
 0 1 2 3



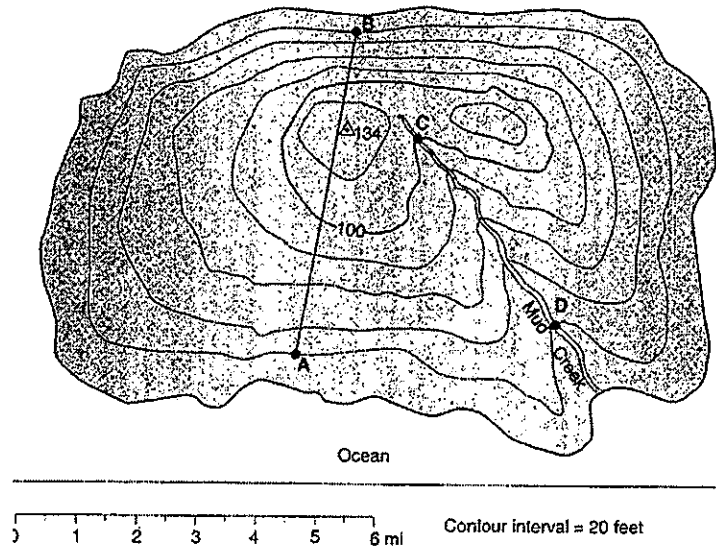
0 1 2 3 miles      Contour Interval = 100 feet

5. What is the gradient between points X and Y? **Show your work!**

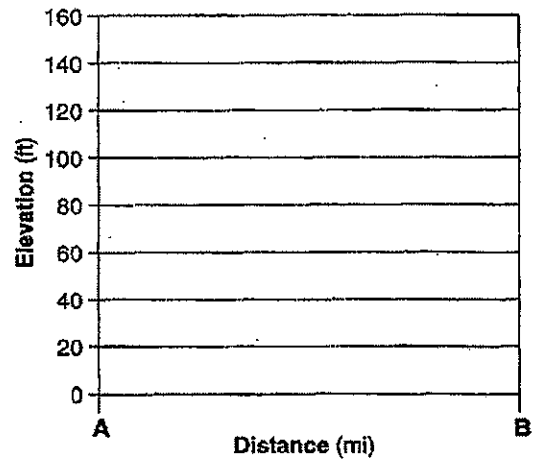
6. What direction is Snapper Creek flowing?

# Topographic Map Questions

Base your answers to questions 1 through 4 on the topographic map below, which shows a small island in an ocean. Points A, B, C and D represent surface locations on the island. The triangle symbol represents an elevation on the hilltop. Elevations are measured in feet and distances are measured in miles.



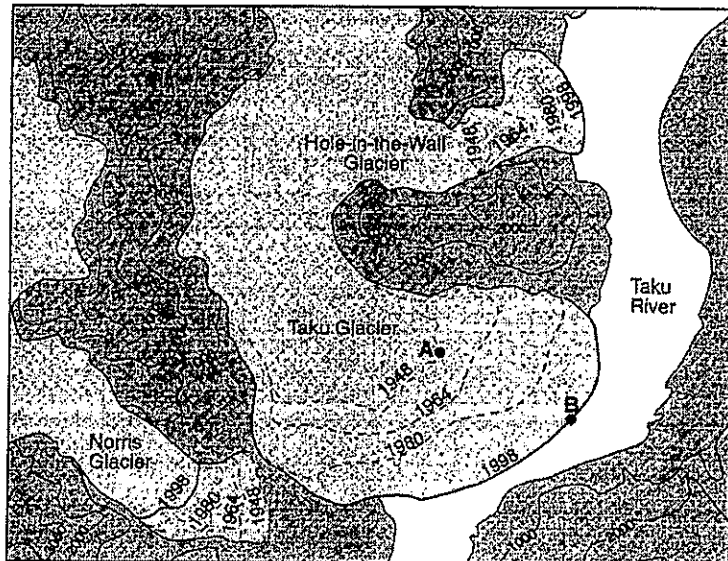
1. State the compass direction toward which Mud Creek flows.
2. Calculate the gradient of Mud creek between points C and D and label your answer with the correct units. Show all steps of the 3-step process and circle your answer.
3. On the grid to the right, construct a profile along line AB by plotting an X for the elevation of each contour line that crosses line AB. Connect the X's with a smooth, curved line to complete the profile.



4. Explain how the contour lines on the map indicate that the north side of the island has the steepest slope.

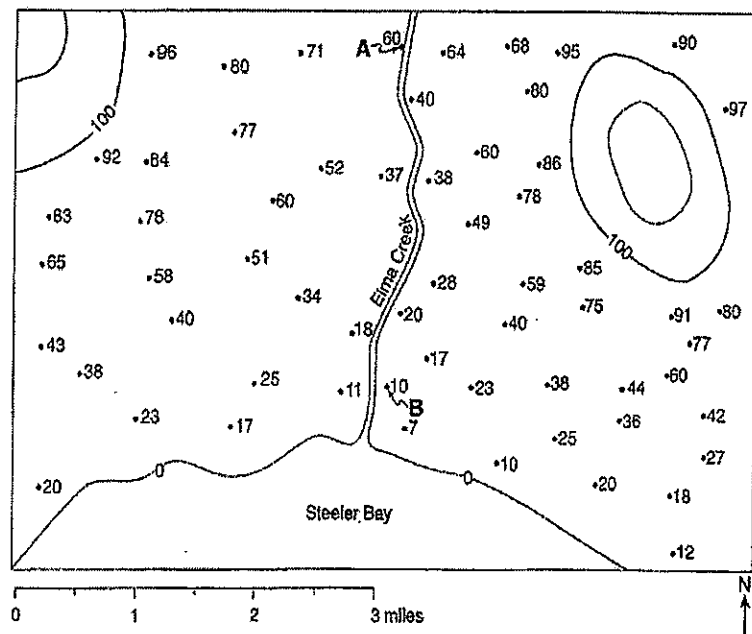
9. Using the map to the right, determine the rate, in miles per year, that the front edge of the Taku glacier moved between point A and point B.

10. What is the contour interval on this map?



Base your answers to questions 11 through 13 on the field map to the right. The map shows elevations, measured in feet, of a number of points in a certain geographic region. Contour lines have been drawn for the 100-foot and 120-foot elevations. Points A and B represent two spot elevations on the map.

11. On the map to the right, draw the 60-foot contour line. Make sure that the contour line extends to the edges of the map.
12. Toward which general compass direction does Elma Creek flow?
13. Calculate the gradient between points A and B. Label the answer with the correct units.



8. \_\_\_\_\_ What processes form granite?

- (1) compaction and cementation of sediments
- (2) cooling and solidification of magma
- (3) uplift and weathering of bedrock
- (4) application of heat and pressure to shale

9. \_\_\_\_\_ Which group of elements is listed in increasing order based on the percent by mass in Earth's crust?

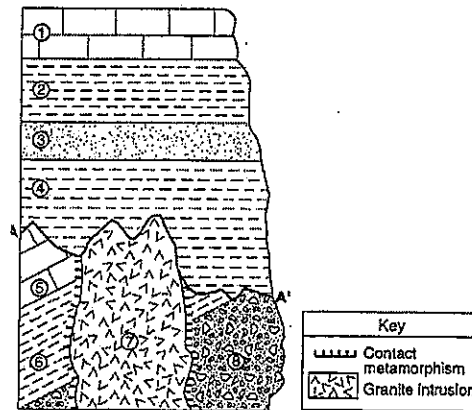
- (1) aluminum, iron, calcium                      (3) magnesium, iron, aluminum
- (2) aluminum, silicon, magnesium              (4) magnesium, silicon, calcium

10. \_\_\_\_\_ Which characteristic of the granite intrusion provides the most direct evidence that it solidified deep underground?

- (1) very hard                      (3) light color
- (2) coarse texture              (4) felsic composition

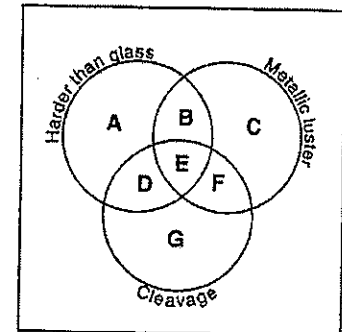
11. \_\_\_\_\_ Which rock most probably formed in the contact metamorphic zone with rock unit 6?

- (1) marble                      (3) quartzite
- (2) basalt                      (4) hornfels



12. Identify the sedimentary rock composed of halite and explain how this rock is usually formed.

Base your answers to questions 13 and 14 on the diagram to the right of a mineral classification scheme that shows the properties of certain minerals. Letters A through G represent mineral property zones. Zone E represents the presence of all three properties. For example, a mineral that is harder than glass, has a mineral luster, but does not have cleavage, would be placed in zone B. Assume that glass has a hardness of 5.5.



13. In which zone would the mineral potassium feldspar be placed?

14. State the name of one mineral listed on the *Properties of Common Mineral Table* that could *not* be placed in any one of the zones.

15. State the name of the dominant sediment particle that is compacted to form the rock shale.

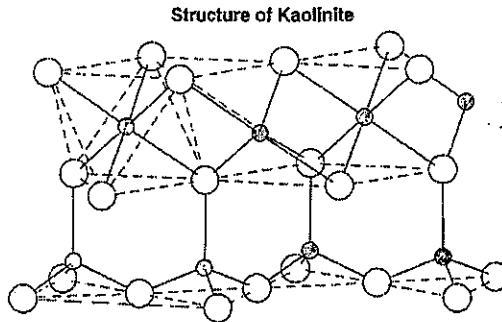
24. \_\_\_\_\_ Which physical characteristic best describes the rock phyllite?

- (1) glassy texture with gas pockets      (3) bioclastic texture with cemented shell fragments  
 (2) clastic texture with angular fragments      (4) foliated texture with microscopic mica crystals

25. \_\_\_\_\_ Which home-building material is made mostly from the mineral gypsum?

- (1) plastic pipes      (2) window glass      (3) drywall panels      (4) iron nails

The diagram to the right represents a part of structure of the mineral kaolinite.



the crystal

the one

26. \_\_\_\_\_ An arrangement of atoms such as shown in the diagram represents a mineral's

- (1) age of formation  
 (2) infiltration rate  
 (3) physical properties  
 (4) temperature of formation

Base your answers to questions 27 through 29 on the diagram and table to the right. The diagram represents a felsic igneous rock. Letters A, B and C represent three different minerals in the rock sample.



(Actual size)

The table describes the physical properties of minerals A, B and C found in the igneous rock sample.

Mineral	Key	Physical Properties
A		pink, cleaves in two directions at 90°
B		white, cleaves in two directions, striations visible
C		colorless or clear with a glassy luster

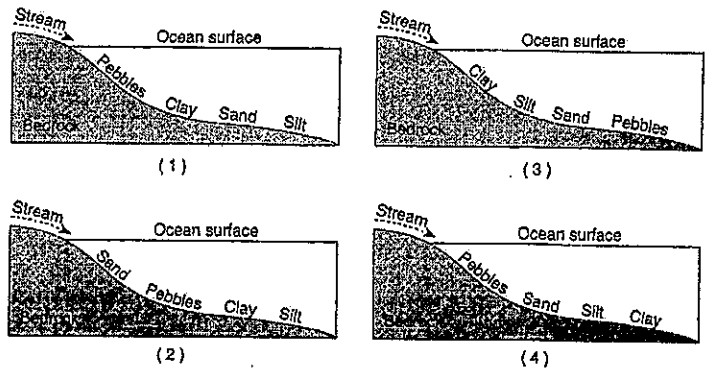
27. State the texture of this igneous rock.

28. On the table provided to the right, state the names of minerals A, B and C.

Mineral	Name of Mineral
A	
B	
C	

29. State two processes responsible for the formation of an igneous rock.

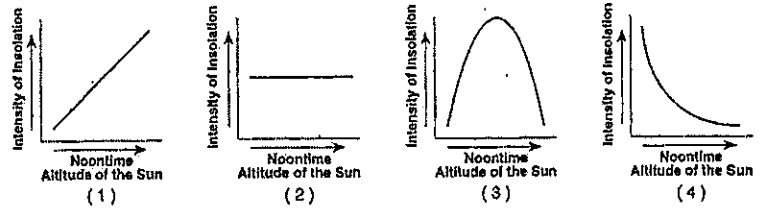
7. \_\_\_\_\_ Which profile best shows the general depositional pattern that occurs when water from a stream enters the ocean.



8. What characteristic of the stream changes to cause the deposition to occur?

9. If a glacier completely melted, what *two* pieces of evidence could a scientist find that a glacier had existed in this area?

10. \_\_\_\_\_ Which graph to the right best represents the relationship between the slope of a river and the particle size that can be transported by that river?

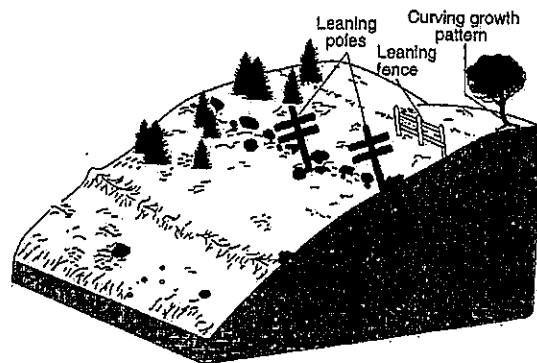


11. \_\_\_\_\_ Which agent of erosion was primarily responsible for forming the long, narrow, U-shaped valleys in the Finger Lakes region of New York State?

- (1) wind      (2) landslides      (3) meandering streams      (4) continental glaciers

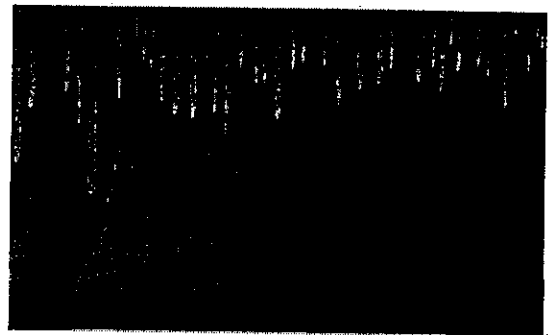
12. \_\_\_\_\_ Based on the diagram to the right, which erosional agent had the greatest effect on tree growth and the structures that humans have built on this landscape?

- (1) running water      (3) prevailing wind  
 (2) moving ice      (4) mass movement



The diagram to the right shows some features in a cave.

13. \_\_\_\_\_ What type of rock was chemically weathered by acidic groundwater to produce the cave and its features?



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



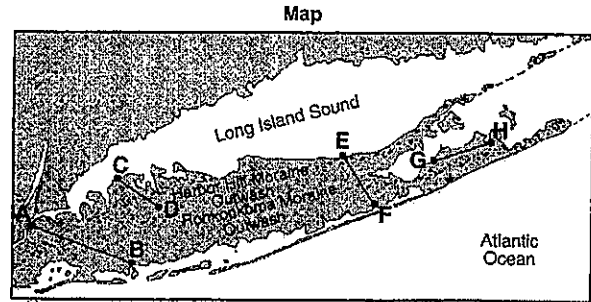
Base your answers to questions 18 and 19 on the map of Long Island, New York. AB, CD, EF, and GH are reference lines on the map.

18. \_\_\_\_\_ Which agent of erosion transported the sediments that formed the moraines on the map?

- (1) water (2) wind (3) ice (4) mass movement

19. \_\_\_\_\_ A major difference between sediments in the outwash and sediments in the moraines is that the sediments deposited in the outwash are

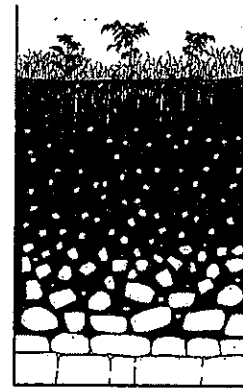
- (1) larger (2) sorted (3) more angular (4) older



The cross section to the right shows a soil profile

20. \_\_\_\_\_ The soil was formed primarily by

- (1) erosion by glaciers (2) erosion by running water (3) capillarity and human activity (4) weathering and biological activity



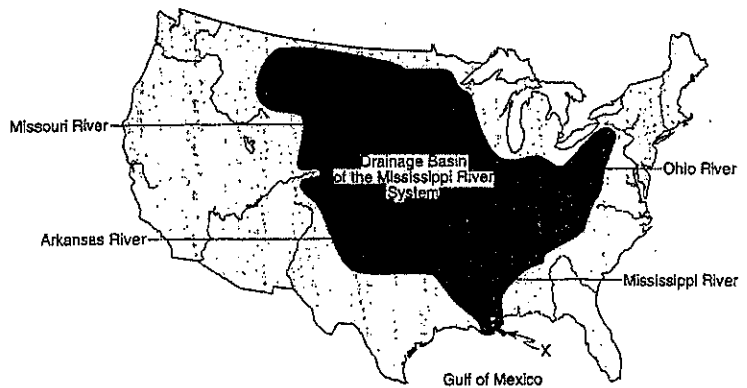
Base your answers to questions 21 through 23 on the map to the right, which shows the drainage basin of the Mississippi River system. Several rivers that flow into the Mississippi River are labeled. The arrow at location X shows where the Mississippi River enters the Gulf of Mexico.

21. \_\_\_\_\_ The entire land area drained by the Mississippi River is referred to as a

- (1) levee (2) watershed (3) meander belt (4) flood plain

22. \_\_\_\_\_ Sediments deposited at location X by the Mississippi River most likely have which characteristics?

- (1) angular fragments arranged as mixtures (2) rocks with parallel scratches and grooves (3) rock particles arranged in sorted beds (4) high density minerals with hexagonal crystals



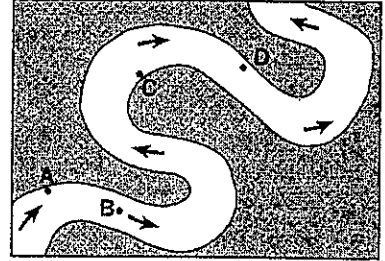
23. \_\_\_\_\_ The structure formed by the deposition of sediments at location X is best described as a

- (1) moraine (2) tributary (3) delta (4) drumlin

7. \_\_\_\_\_ A meandering stream deposits most of its sediments on the

- (1) inside of meanders where the stream flows faster
- (2) inside of meanders where the stream flows slower
- (3) outside of meanders where the stream flows faster
- (4) outside of meanders where the stream flows slower

The map to the right shows a meandering stream. Points A, B, C and D represent locations along the stream bottom.

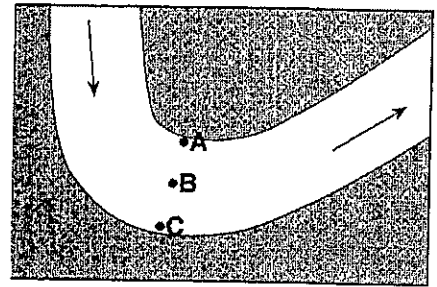


8. \_\_\_\_\_ At which location is the greatest amount of sediment most likely being deposited?

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

9. Describe *two* surface characteristics that will affect the rate of stream runoff into the ocean.

The map to the right shows the bend of a large meandering stream. The arrows show the direction of stream flow. Letters A, B and C are positions on the stream bed where erosion and deposition data were collected.



10. \_\_\_\_\_ Which table below best represents the locations where erosion and deposition are dominant and where an equilibrium exists between the two processes? (A check mark represents the dominant process for each lettered location.)

	Erosion	Equilibrium	Deposition
A		✓	
B			✓
C	✓		

(1)

	Erosion	Equilibrium	Deposition
A	✓		
B		✓	
C			✓

(3)

	Erosion	Equilibrium	Deposition
A			✓
B	✓		
C		✓	

(2)

	Erosion	Equilibrium	Deposition
A			✓
B		✓	
C	✓		

(4)