RR#5 - Multiple Choice

1. Most tornadoes in the Northern Hemisphere are best described as violently rotating columns of air surrounded by

   1) clockwise surface winds moving toward the columns
   2) clockwise surface winds moving away from the columns
   3) counterclockwise surface winds moving toward the columns
   4) counterclockwise surface winds moving away from the columns

2. EI Cuy is a South American city located at 40° south latitude. The first day of winter at this location occurs on June 21. During which month would the coldest day of the year most likely occur at this location?

   1) May   2) July
   3) November   4) January

3. The map below shows an eastern portion of North America. Points *A* and *B* represent locations on the eastern shoreline.

Which factor is primarily responsible for location *A* having a lower average yearly temperature than location *B?*

   1) nearness to a large body of water
   2) elevation
   3) latitude
   4) prevailing winds

4. Which combination of climate factors generally results in the coldest temperatures?

   1) low elevation and low latitude
   2) low elevation and high latitude
   3) high elevation and low latitude
   4) high elevation and high latitude

5. The table below shows the latitude and the average
yearly temperature for four different cities.

| City	Singapore	Calcutta	Washington, D.C.	Moscow
Latitude	1° N	23° N	39° N	56° N
Average Yearly Temperature	81°F	79°F	57°F	39°F

It can be inferred from this table that the cities at
higher latitudes have

1) lower average yearly temperatures because these
   cities receive insolation at a higher angle during
   the year
2) lower average yearly temperatures because these
   cities receive insolation at a lower angle during
   the year
3) higher average yearly temperatures because these
   cities receive insolation at a higher angle during
   the year
4) higher average yearly temperatures because these
   cities receive insolation at a lower angle during
   the year

Base your answers to questions **6** through **8** on the climate graphs below, which show average monthly precipitation and temperatures at four cities, *A, B, C,* and *D.*

City A

City C

City B

City D

Key

▨ Precipitation

— Temperature
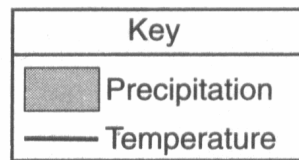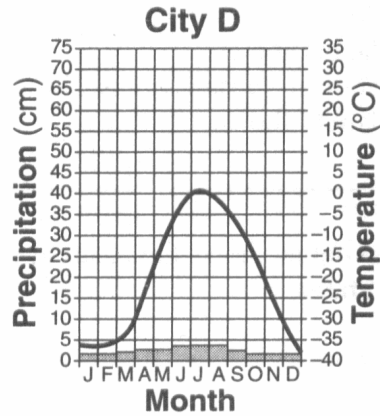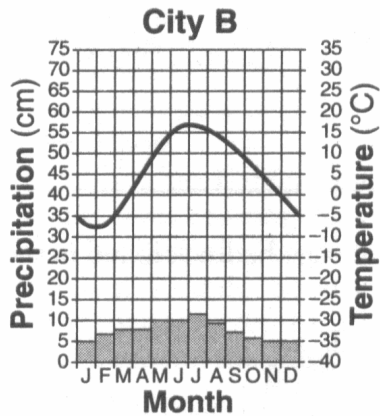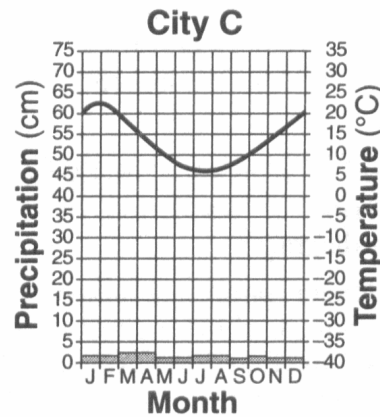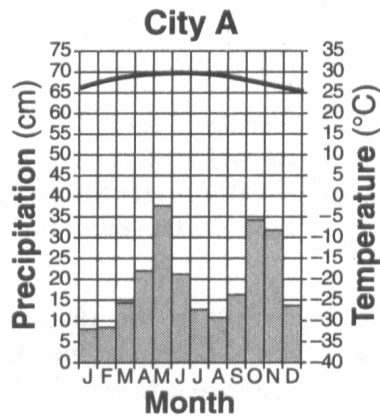
6. Very little water will infiltrate the soil around city D because the region usually has

1) a frozen surface
3) a small amount of runoff

2) nearly flat surfaces
4) permeable soil

7. It can be concluded that city *C* is located in the Southern Hemisphere because city *C* has

1) small amounts of precipitation throughout the year
2) large amounts of precipitation throughout the year
3) its warmest temperatures in January and February
4) its warmest temperatures in July and August

8. City *A* has very little variation in temperature during the year because city *A* is located

1) on the dry side of a mountain
3) near the center of a large landmass

2) on the wet side of a mountain
4) near the equator

9. Snowfall is rare at the South Pole because the air over the South Pole is usually

   1) rising and moist   2) rising and dry
   3) sinking and moist   4) sinking and dry

10. What is the best explanation for these two statements?

   • Some mountains located near the Earth's Equator have snow-covered peaks.
   • Icecaps exist at the Earth's poles.

   1) High elevation and high latitude have a similar effect on climate.
   2) Both mountain and polar regions have arid climates.
   3) Mountain and polar regions receive more energy from the Sun than other regions do.
   4) An increase in snowfall and an increase in temperature have a similar effect on climate.

11. The photograph below shows Mt. Kilimanjaro, a volcano in Africa, located near the equator.
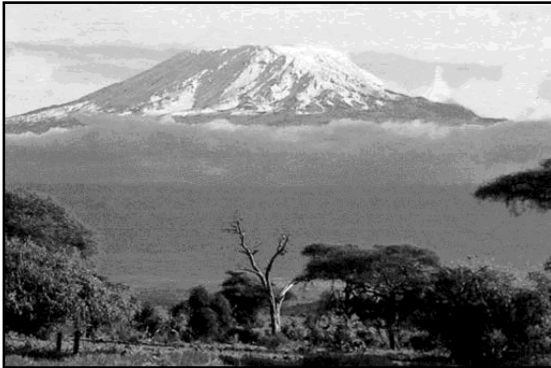
   Which climate factor is responsible for the snow seen on Mt. Kilimanjaro?

   1) high latitude
   2) high elevation
   3) nearness to a cold ocean current
   4) nearness to a high-pressure weather center

12. The cross section below represents four locations on a mountain. The arrow indicates the prevailing wind direction.
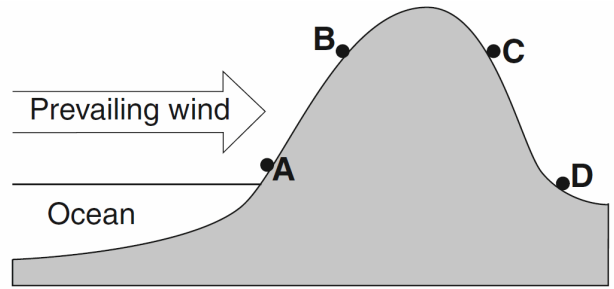
   Which location has the warmest and most arid climate?

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

13. During an El Nino event, the South Equatorial Current reverses direction and flows over the top of northern portions of the Peru Current, causing

   1) warmer surface ocean waters along the northeast coast of South America
   2) warmer surface ocean waters along the northwest coast of South America
   3) cooler surface ocean waters along the northeast coast of South America
   4) cooler surface ocean waters along the northwest coast of South America

14. The arrows on the map below show the prevailing winds at a midlatitude coastal city.
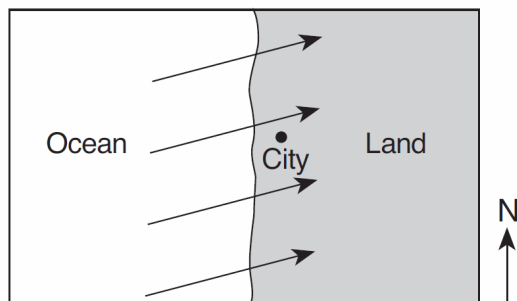
This city most likely has a climate that is

1) arid, with a small difference between the highest and lowest yearly temperatures
2) arid, with a large difference between the highest and lowest yearly temperatures
3) humid, with a small difference between the highest and lowest yearly temperatures
4) humid, with a large difference between the highest and lowest yearly temperatures

15. Which ocean current warms the climate of northwestern Europe?

1) North Atlantic Current
2) Canary Current
3) North Equatorial Current
4) Labrador Current

16. The direction of movement of the major surface ocean currents is most affected by Earth's

1) tilted axis   2) prevailing winds
3) rate of revolution   4) tidal action

17. Arrows on the maps below show differences in the direction of winds in the region of India and the Indian Ocean during January and July. Isobar values are recorded in millibars.
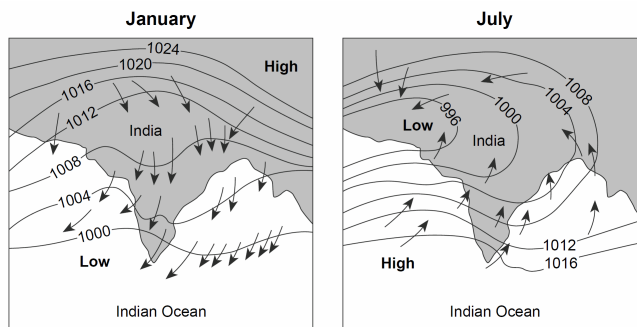
Heavy monsoon rains usually occur in India during

1) January, when winds blow from the land
2) January, when winds blow toward high pressure
3) July, when winds blow from the ocean
4) July, when winds blow toward high pressure

18. The table below shows the average January air temperature from 1901 to 2006 in two different cities in New York State.

Data Table

City	Average January Air Temperature (°F)
Albany	21.4
New York City	29.7

The most likely cause of this air temperature difference is that New York City is located

1) in a different prevailing wind belt
2) at a higher latitude
3) near a large body of water
4) at a higher elevation

19. Which natural event temporarily slows or reverses surface ocean currents in the equatorial region of the Pacific Ocean, causing a disruption of normal weather patterns?

1) monsoons   2) volcanic eruptions
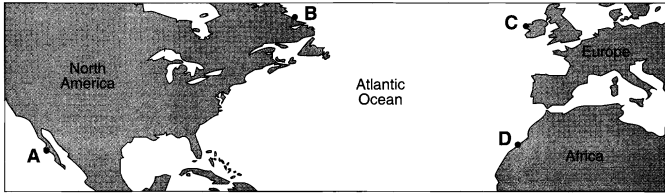3) El Niño   4) deforestation

20. On the map below, dark-gray areas represent regions of lake-effect snow on a December day.
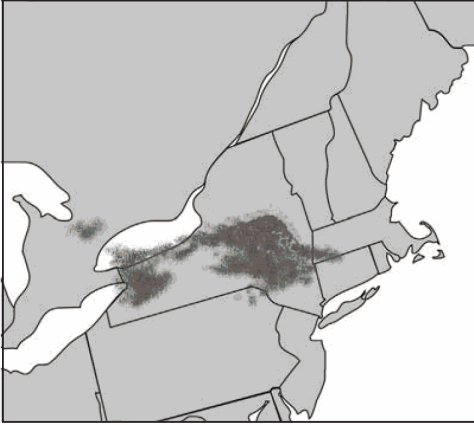
Which New York State location appears to be experiencing a lake-effect snowstorm?

1) New York City   2) Utica
3) Plattsburgh   4) Watertown

21. The map below shows four coastal locations labeled *A, B, C*, and *D*.

The climate of which location is warmed by a nearby major ocean current?

1) *A*   2) *B*   3) *C*   4) *D*

Base your answers to questions **22** through **24** on the maps and the passage below. The maps show differences in trade wind strength, ocean current direction, and water temperature associated with air-pressure changes from normal climate conditions to EI Niño conditions.
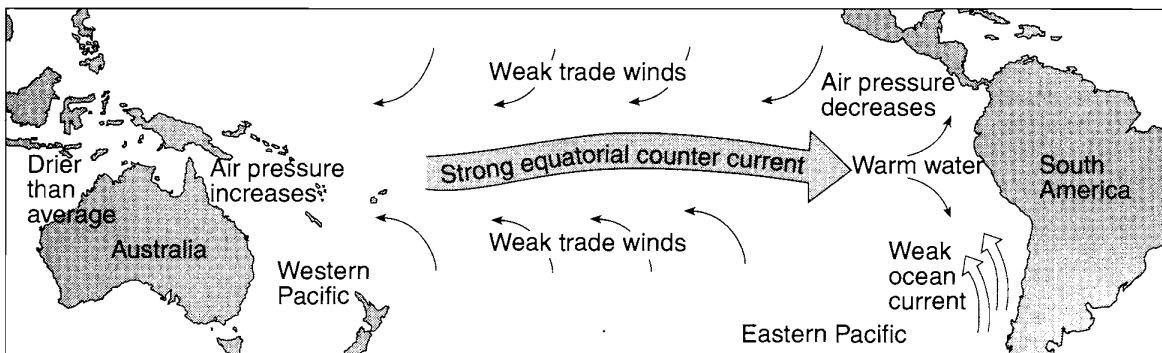
EI Niño Conditions

EI Niño conditions occur with a buildup of warm water in the equatorial Pacific Ocean off the coast of South America. The immediate cause of this buildup is a change in air pressure that weakens the southern trade winds. These are the planetary winds that move air from 30° S to the equator. Normally, these strong, steady winds, with the help of their counterparts in the Northern Hemisphere, push equatorial water westward away from South America. But, at intervals of two to seven years, these winds weaken, causing the westward water flow to reverse. This results in an accumulation of unusually warm water on the east side of the equatorial Pacific Ocean. This warm water not only changes the characteristics of the air above it, but also is thought to be the cause of weather changes around the world. EI Niño conditions may last only a few months, but often last a year or two.

Normal Climate Conditions
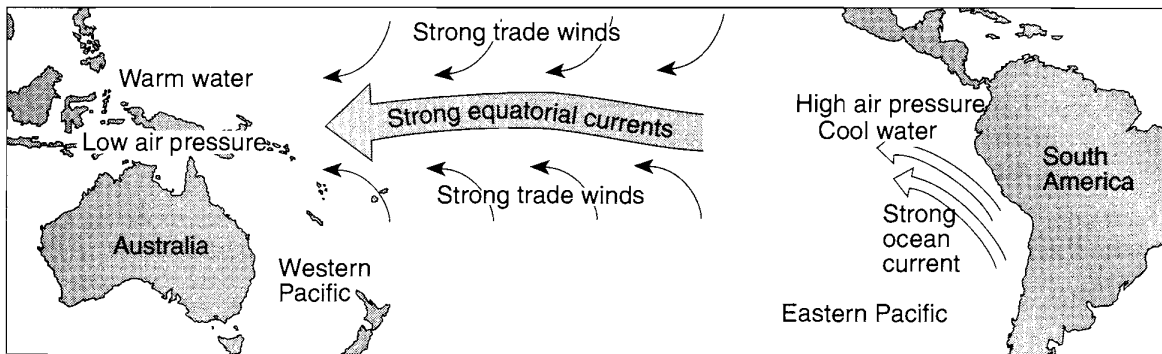
El Niño Conditions

22. Equatorial Pacific trade winds weaken during EI Niño conditions when air pressure

   1) falls in the western Pacific and rises in the eastern Pacific
   2) falls in both the western and eastern Pacific
   3) rises in the western Pacific and falls in the eastern Pacific
   4) rises in both the western and eastern Pacific

23. During EI Niño conditions, air above the Pacific Ocean moving over the land on the equatorial west coast of South America is likely to be .

1) cooler and drier than usual
2) cooler and wetter than usual
3) warmer and drier than usual
4) warmer and wetter than usual

24. Under normal climate conditions, what are the characteristics of the surface ocean current that flows along most of the west coast of South America?

1) cool water moving toward the equator
2) cool water moving away from the equator
3) warm water moving toward the equator
4) warm water moving away from the equator

25. Which coastal location experiences a cooler summer climate due to ocean currents?

1) southeast coast of North America
2) northeast coast of Australia
3) southwest coast of South America
4) northwest coast of Europe

26. The map below shows the locations of Virginia Beach, Virginia, and Springfield, Missouri.

Virginia Beach experiences cooler summers and warmer winters than Springfield because Virginia Beach

1) is located closer to the Atlantic Ocean
2) is located closer to the equator
3) has a greater average yearly duration of insolation
4) has a greater average yearly intensity of insolation

27. Base your answer to the following question on the map and graph below. The map shows two cities, Arica and Rio de Janeiro, located on opposite coasts of South America. Both cities are near sea level. The graph shows the average monthly temperatures for the cities.

South America

Average Monthly Temperatures of Rio de Janeiro and Arica
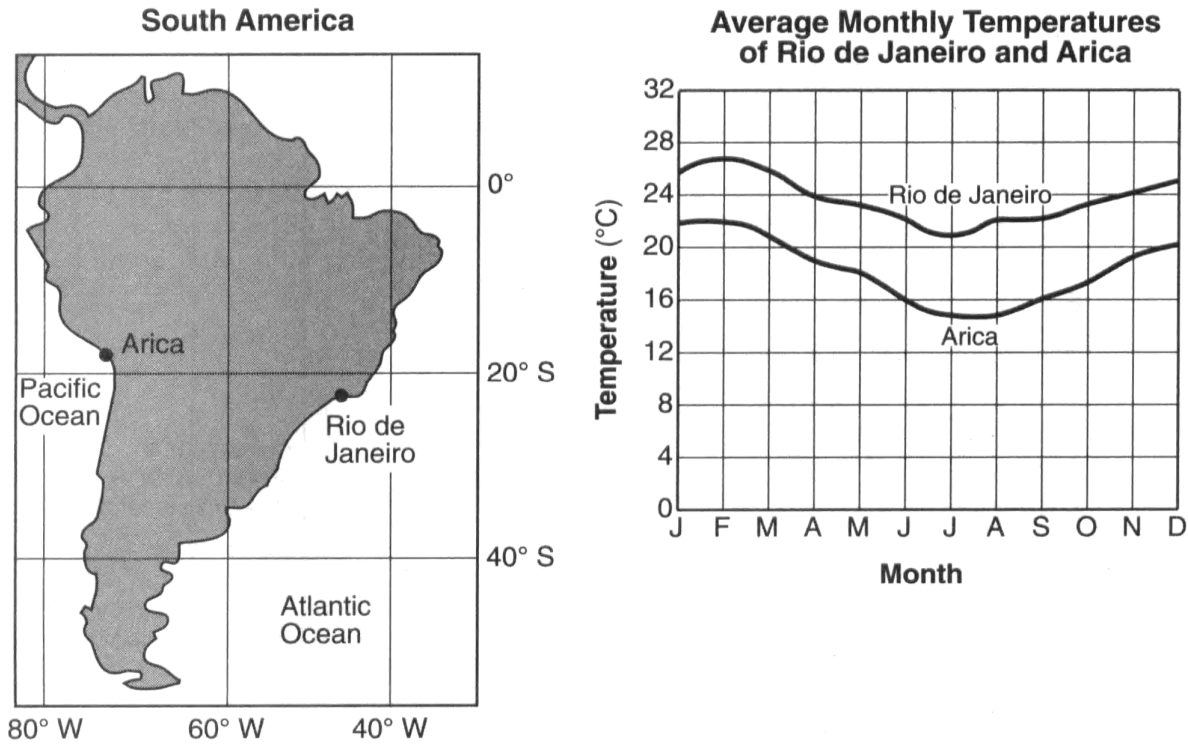
Why does Arica have cooler average monthly temperatures than Rio de Janeiro?

1) Rio de Janeiro receives insolation at a higher angle than Arica.
2) Rio de Janeiro is influenced by a warmer ocean current than Arica.
3) Arica is farther north than Rio de Janeiro.
4) Arica receives yearly insolation that is less intense than Rio de Janeiro.

28. Which ocean current carries cool water toward Earth's equator?

1) Alaska Current
2) East Australia Current
3) Peru Current
4) North Atlantic Current

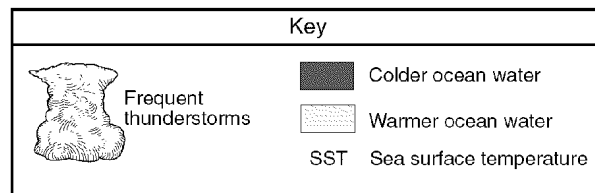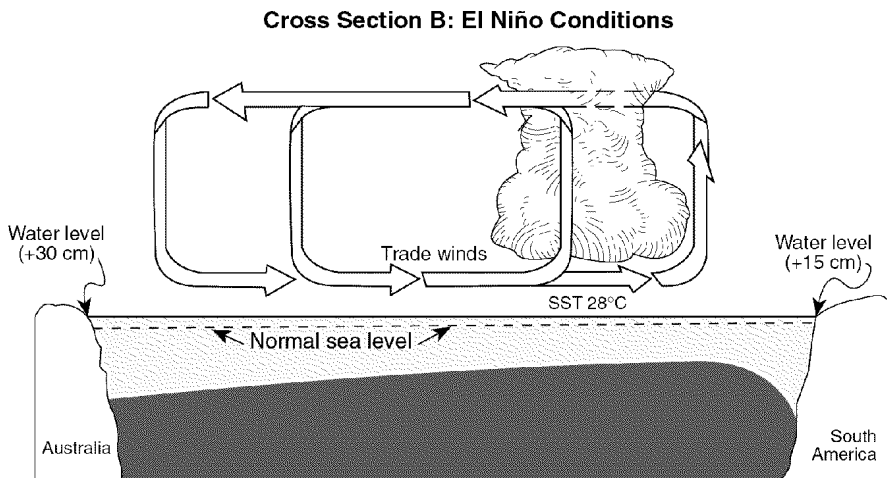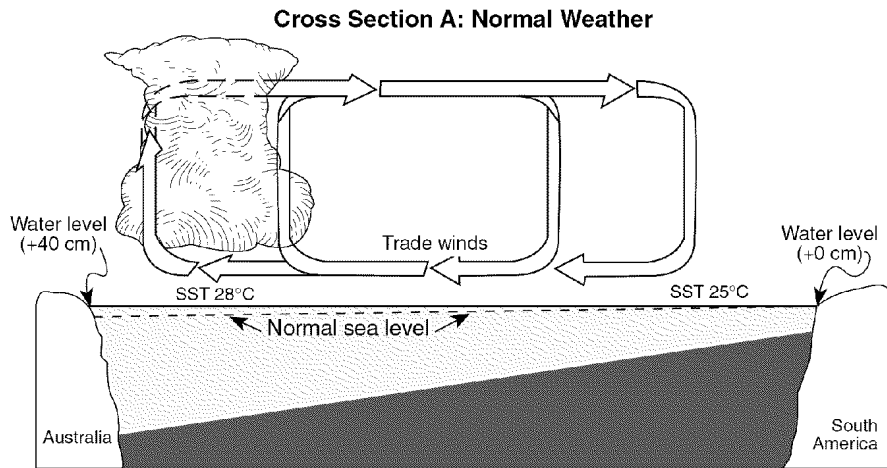29. The cross section below shows a house on the shore of Lake Ontario in August.
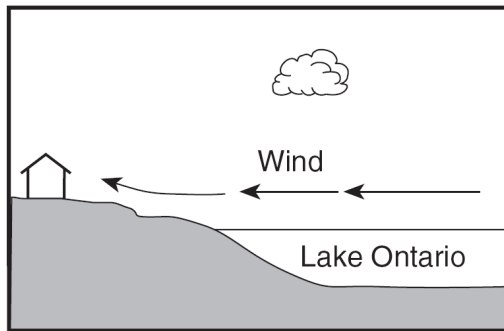
(Not drawn to scale)

Under which conditions would the wind shown in the cross section most likely occur?

1) at 2 a.m., when the air over land is 70°F and the air over the lake is 80°F
2) at 6 a.m., when the air over land is 70°F and the air over the lake is 70°F
3) at 2 p.m., when the air over land is 80°F and the air over the lake is 70°F
4) at 10 p.m., when the air over land is 70°F and the air over the lake is 72°F

30. London, England, is located at approximately 51° 30' north latitude and 0° longitude. Elmira, New York, is located at approximately 42° 10' north latitude and 76° 54' west longitude. What is one reason why London has a warmer average winter temperature than Elmira?

1) London is located closer to the equator.
2) London is located at a higher elevation.
3) London's climate is modified by the North Atlantic Ocean Current.
4) London's climate is modified by its longer duration of insolation.

31. Compared to the climate conditions of dry inland locations, the climate conditions of locations influenced by a nearby ocean generally result in

1) hotter summers and colder winters, with a larger annual range of temperatures
2) hotter summers and colder winters, with a smaller annual range of temperatures
3) cooler summers and warmer winters, with a larger annual range of temperatures
4) cooler summers and warmer winters, with a smaller annual range of temperatures

Base your answers to questions **32** through **36** on the two cross sections below, which represent the Pacific Ocean and the atmosphere near the Equator during normal weather (cross section *A*) and during El Niño conditions (cross section *B*). Sea surface temperatures (SST) are labeled and trade-wind directions are shown with arrows. Cloud buildup indicates regions of frequent thunderstorm activity. The change from normal sea level is shown at the side of each diagram.

Cross Section A: Normal Weather

Water level (+40 cm)
Trade winds
Water level (+0 cm)
SST 28°C
SST 25°C
Normal sea level
Australia
South America

Cross Section B: El Niño Conditions

Water level (+30 cm)
Trade winds
Water level (+15 cm)
SST 28°C
Normal sea level
Australia
South America

Key

Frequent thunderstorms
Colder ocean water
Warmer ocean water
SST   Sea surface temperature

32. Which statement correctly describes sea surface temperatures along the South American coast and Pacific trade winds during El Niño conditions?

1) The sea surface temperatures are warmer than normal, and Pacific trade winds are from the west.
2) The sea surface temperatures are warmer than normal, and Pacific trade winds are from the east.
3) The sea surface temperatures are cooler than normal, and Pacific trade winds are from the west.
4) The sea surface temperatures are cooler than normal, and Pacific trade winds are from the east.

33. Compared to normal weather conditions, the shift of the trade winds caused sea levels during El Niño conditions to

    1) decrease at both Australia and South America
    2) decrease at Australia and increase at South America
    3) increase at Australia and decrease at South America
    4) increase at both Australia and South America

34. During El Niño conditions, thunderstorms increase in the eastern Pacific Ocean region because the warm, moist air is

    1) less dense, sinking, compressing, and warming
    2) less dense, rising, expanding, and cooling
    3) more dense, sinking, compressing, and warming
    4) more dense, rising, expanding, and cooling

35. The development of El Niño conditions over this region of the Pacific Ocean has caused

    1) changes in worldwide precipitation patterns
    2) the reversal of Earth's seasons
    3) increased worldwide volcanic activity
    4) decreased ozone levels in the atmosphere

36. Earth's entire equatorial climate zone is generally a belt around Earth that has

    1) high air pressure and wet weather   2) high air pressure and dry weather
    3) low air pressure and wet weather   4) low air pressure and dry weather

37. The cross section below represents a prevailing wind flow that causes different climates on the windward and leeward sides of a mountain range.
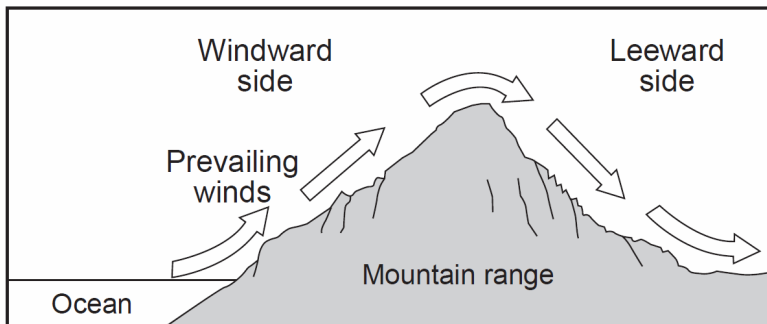

Compared to the temperature and moisture of the air rising on the windward side, the temperature and moisture of the air descending at the same altitude on the leeward side will be

    1) warmer and drier   2) warmer and more moist
    3) cooler and drier   4) cooler and more moist
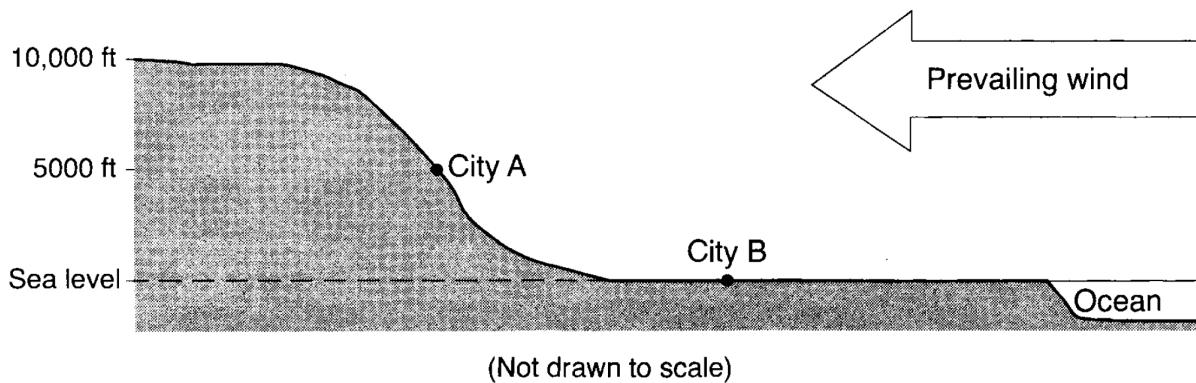
38. The cross section below represents prevailing winds moving over a coastal mountain range. Letters *A* through D represent locations on Earth's surface.
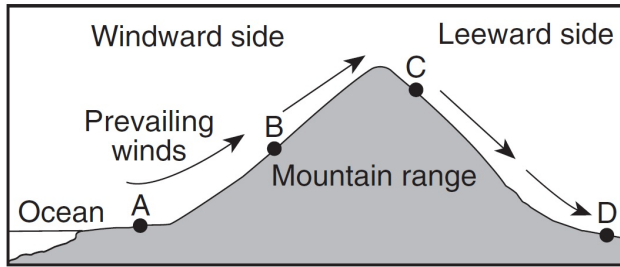
Which location will most likely have the least annual precipitation?

1) *A*   2) *B*   3) *C*   4) *D*

39. The cross section below shows two cities, *A* and *B* at different elevations.

(Not drawn to scale)

Compared to the yearly temperature and precipitation at city *B,* city *A* most likely has

1) lower temperatures and less precipitation
2) lower temperatures and more precipitation
3) higher temperatures and less precipitation
4) higher temperatures and more precipitation

40. The diagram below shows the flow of air over a mountain, from location *A* to *B* to *C*.
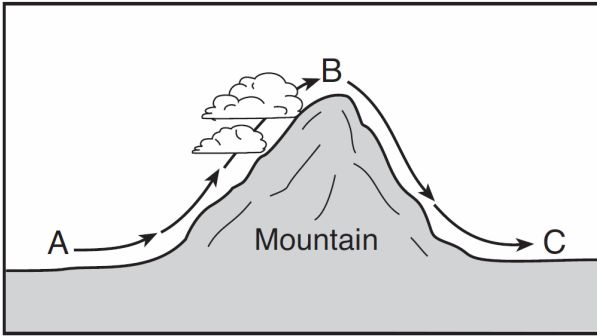
Which graph best shows how the air temperature and probability of precipitation change during this air movement?
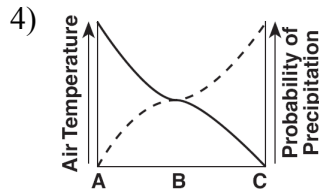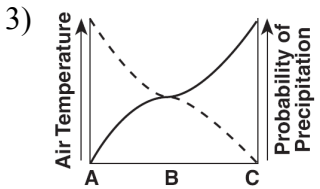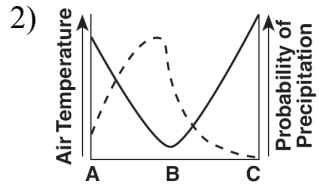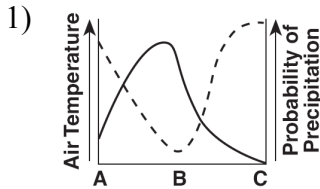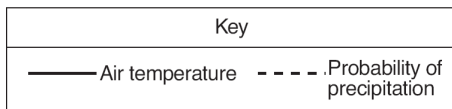
Base your answers to questions **41** and **42** on the diagram below, which shows air movement over a mountain range. The arrows indicate the direction of airflow. Points 1 through 3 represent locations on Earth's surface.
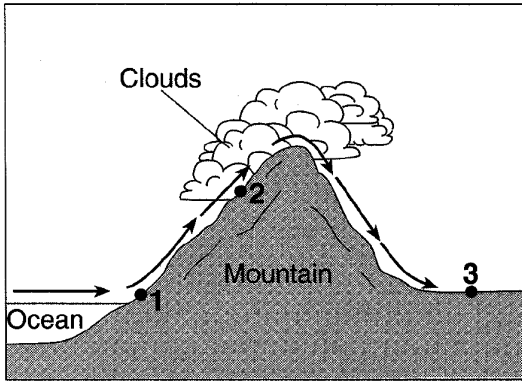

41. Cloud formation at location 2 is the direct result of air that is rising,

 1) expanding, and cooling
 2) expanding, and warming
 3) compressing, and cooling
 4) compressing, and warming

42. Compared to the climate at location 1, the climate at location 3 is

 1) cooler and drier   2) cooler and wetter
 3) warmer and drier   4) warmer and wetter

43. The arrows on the cross section below show the prevailing wind that flows over a mountain. Points *A* and *B* represent locations on opposite sides of the mountain.
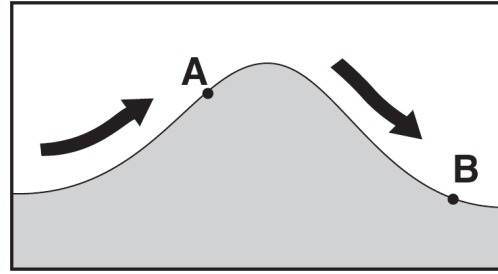
Which statement correctly describes the differences in the climates of locations *A* and *B*?

 1) Location *A* is warmer and drier than location *B*.
 2) Location *A* is cooler and wetter than location *B*.
 3) Location *B* is warmer and wetter than location *A*.
 4) Location *B* is cooler and drier than location *A*.

44. The arrows in the cross section below show the prevailing winds moving across northern New York State into Vermont during the summer.
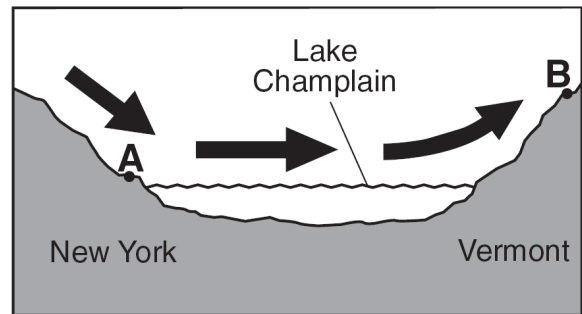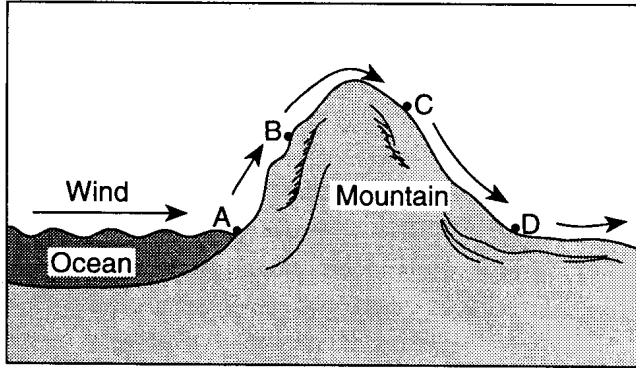

(Not drawn to scale)

Compared to the climate of location *A*, the climate of location *B* is

 1) warmer and wetter   2) warmer and drier
 3) cooler and wetter   4) cooler and drier

45. The cross section below shows the flow of prevailing winds over a mountain ridge.

Which location is most likely to receive precipitation?
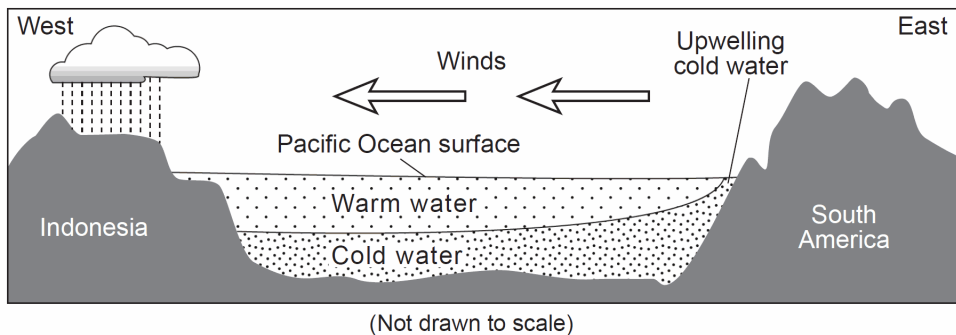
1) *A*   2) *B*   3) *C*   4) *D*

Base your answers to questions **46** through **49** on the passage and cross section below and on your knowledge of Earth science. The cross section represents a generalized region of the Pacific Ocean along the equator during normal (non-El Nino) conditions. The relative temperatures of the ocean water and the prevailing wind direction are indicated.

El Nino

Under normal Pacific Ocean conditions, strong winds blow from east to west along the equator. Surface ocean water piles up on the western part of the Pacific due to these winds. This allows deeper, colder ocean water on the eastern rim of the Pacific to be pulled up (upwelling) to replace the warmer surface water that was pushed westward.

During an El Nino event, these westward-blowing winds get weaker. As a result, warmer water does not get pushed westward as much, and colder water in the east is not pulled toward the surface. This creates warmer surface ocean water temperatures in the east, allowing the thunderstorms that normally occur at the equator in the western Pacific to move eastward. A strong El Nino is often associated with wet winters along the northwestern coast of South America and in the southeastern United States, and drier weather patterns in Southeast Asia (Indonesia) and Australia. The northeastern United States usually has warmer and drier winters in an El Nino year.
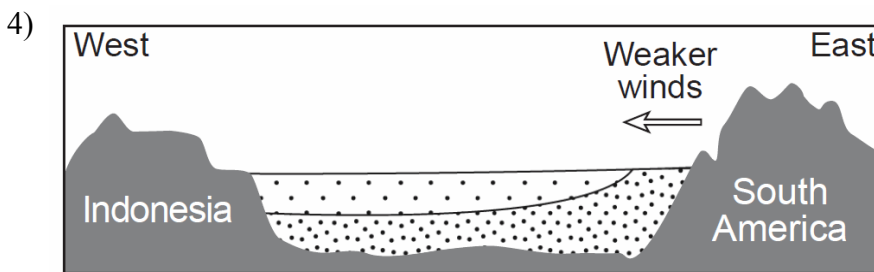
Normal Pacific Ocean Conditions (non-El Niño years)

West — Winds — Upwelling cold water — East

Pacific Ocean surface

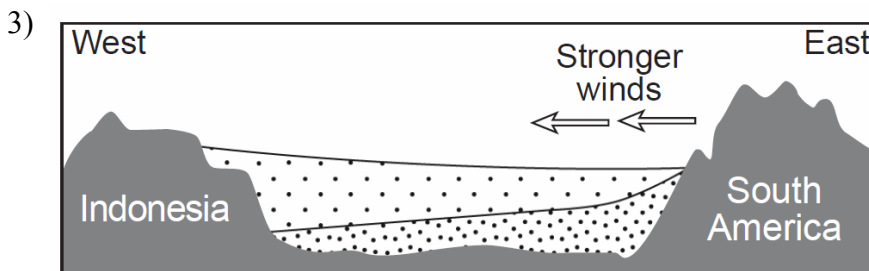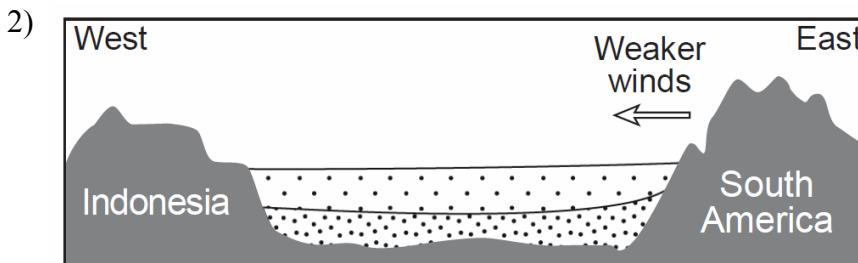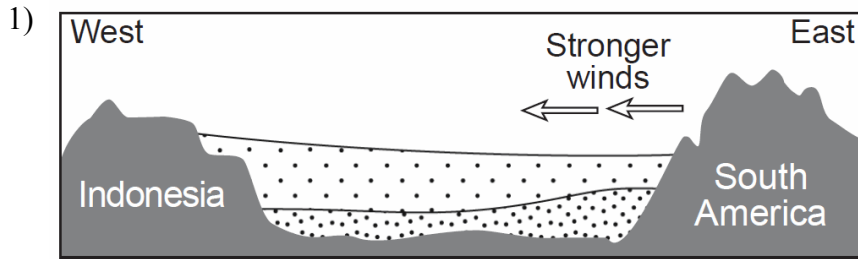Indonesia — Warm water — Cold water — South America

(Not drawn to scale)

46. During an El Niño year, winter climatic conditions in New York State will most likely be

1) colder and wetter   2) colder and drier
3) warmer and wetter   4) warmer and drier

47. Which cross section best represents the changed wind conditions and Pacific Ocean temperatures during an El Nino event? [Diagrams are not drawn to scale.]

Key

⬚ Warm water   ⬚ Cold water

1)

West — Stronger winds ⬅⬅ — East
Indonesia — South America

2)

West — Weaker winds ⬅ — East
Indonesia — South America

3)

West — Stronger winds ⬅⬅ — East
Indonesia — South America

4)

West — Weaker winds ⬅ — East
Indonesia — South America
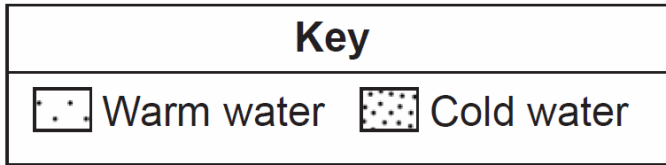
48. Compared to non-El Nino years, which climatic conditions exist near the equator on the western and eastern sides of the Pacific Ocean during an El Nino event?
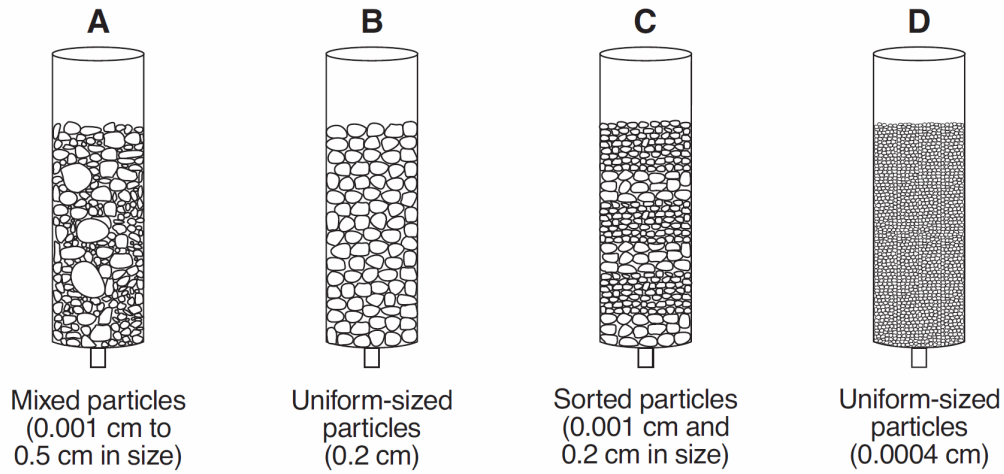
1) The western Pacific is drier and the eastern Pacific is wetter.
2) The western Pacific is wetter and the eastern Pacific is drier.
3) The western and the eastern Pacific are both wetter.
4) The western and the eastern Pacific are both drier.

49. Which statement best describes the planetary wind belts that produce the winds represented in the cross section above?

   1) Southwest and northwest winds diverge at the equator and blow toward the west.
   2) Southwest and northwest winds diverge at the equator and blow toward the east.
   3) Northeast and southeast winds converge at the equator and blow toward the west.
   4) Northeast and southeast winds converge at the equator and blow toward the east.

50. What is the general pattern of air movement on March 21 at Earth's Equator (0°)?

   1) upward, due to low temperature and high pressure
   2) upward, due to high temperature and low pressure
   3) downward, due to low temperature and high pressure
   4) downward, due to high temperature and low pressure

51. Which processes are most likely to cause a rise in the water table?

   1) runoff and erosion
   2) precipitation and infiltration
   3) deposition and burial
   4) solidification and condensation

52. During a rainstorm, when soil becomes saturated, the amount of infiltration

   1) decreases and runoff decreases
   2) decreases and runoff increases
   3) increases and runoff decreases
   4) increases and runoff increases

53. The diagram below shows columns *A*, *B*, *C*, and *D* that contain different sediments.

| A	B	C	D
Mixed particles (0.001 cm to 0.5 cm in size)	Uniform-sized particles (0.2 cm)	Sorted particles (0.001 cm and 0.2 cm in size)	Uniform-sized particles (0.0004 cm)

(Not drawn to scale)

Equal volumes of water were poured through each column. Which column of sediment retained the most water?

1) *A*　　　　　2) *B*　　　　　3) *C*　　　　　4) D

54. Base your answer to the following question on the diagram below, which shows four tubes containing 500 milliliters of sediment labeled *A, B, C, and D. Each tube contains well-sorted, loosely packed particles of uniform shape and size and is open at the top. The classification of the sediment in each tube is labeled.*

A —Silt   B —Fine sand   C —Coarse sand   D —Pebbles

(Not drawn to scale)
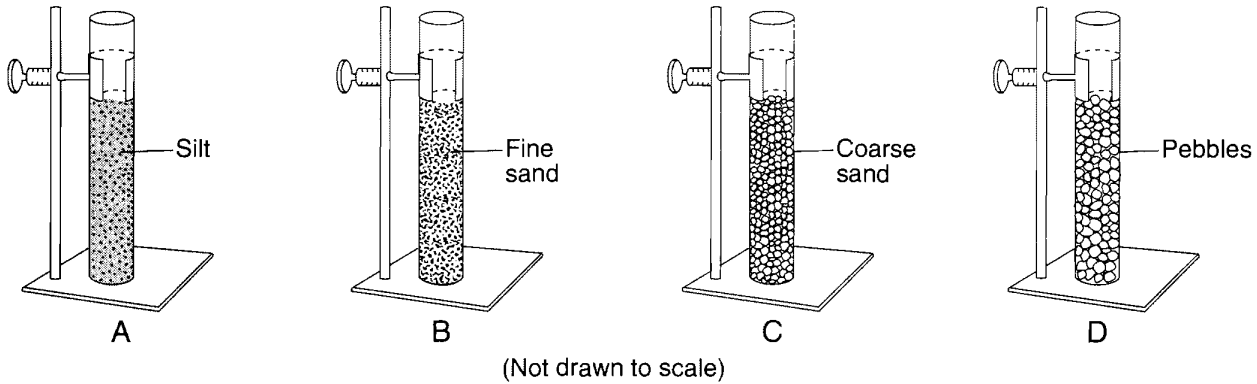
Water was poured into each tube of sediment and the time it took for the water to infiltrate to the bottom was recorded, in seconds. Which data table best represents the recorded results?

1)

Tubes	Infiltration Time (s)
A	5.2
B	3.4
C	2.8
D	2.3

2)

Tubes	Infiltration Time (s)
A	3.2
B	3.3
C	3.2
D	3.3

3)

Tubes	Infiltration Time (s)
A	2.4
B	2.9
C	3.6
D	3.8

4)

Tubes	Infiltration Time (s)
A	3.0
B	5.8
C	6.1
D	2.8

55. Compared to an area of Earth's surface with gentle slopes, an area with steeper slopes most likely has

1) less infiltration and more runoff
2) less infiltration and less runoff
3) more infiltration and more runoff
4) more infiltration and less runoff

56. Which sediment size would allow water to flow through at the fastest rate?

1) clay   2) silt
3) sand   4) pebbles

57. The diagrams below represent four permeable sediment samples. The sediments are composed of the same material, but differ in particle size and sorting. Which sediment sample will most likely have the fastest groundwater infiltration rate?
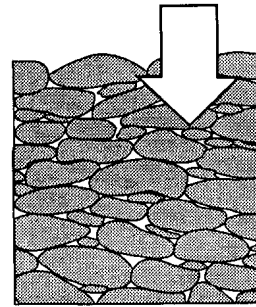
1)

2)

3)

4)
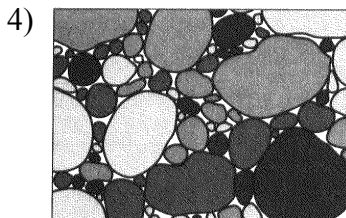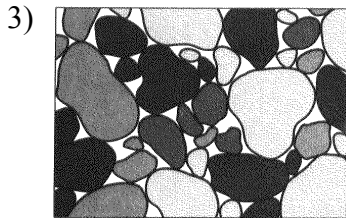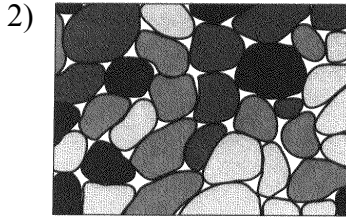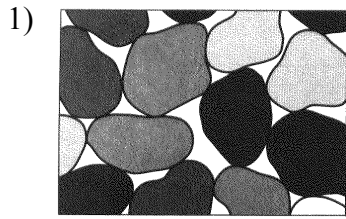
58. Base your answer to the following question on the diagram below, which represents samples of soil and bedrock at Earth's surface. The arrows represent possible infiltration of rainwater.
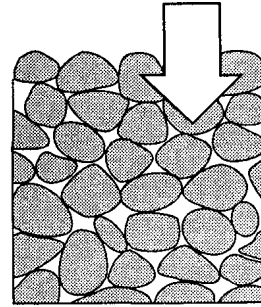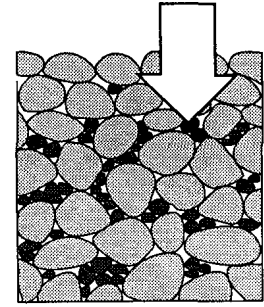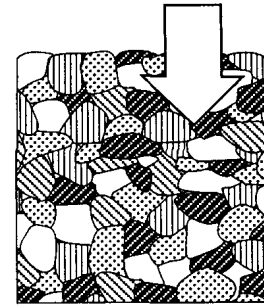

Pebble soil   Pebble-and-sand soil

Conglomerate   Granite bedrock
bedrock

The least amount of rainwater will infiltrate the surface of the

1) pebble soil
2) pebble-and-sand soil
3) conglomerate bedrock
4) granite bedrock

59. Flash flooding often occurs in city areas because

1) runoff decreases during precipitation
2) ground water storage is usually very large
3) roads, pavements, and buildings reduce the infiltration of water into the ground
4) the heat generated by city areas decreases actual evapotranspiration

60. The diagram below shows an experimental setup to compare water retention and permeability in two columns with equal volumes of spherical plastic beads of different diameters.
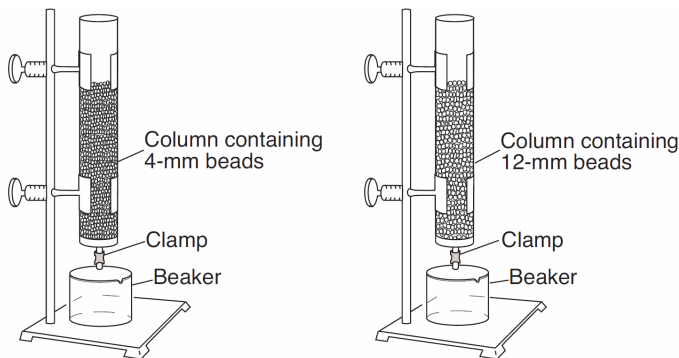
Which statement best describes the water retention and permeability in the two columns of beads?

1) The column with 4-mm beads has greater water retention and permeability.
2) The column with 12-mm beads has greater water retention and permeability.
3) The column with 4-mm beads has greater water retention and the column with 12-mm beads has greater permeability.
4) The column with 12-mm beads has greater water retention and the column with 4-mm beads has greater permeability.

61. During a heavy rainstorm, soil samples A and B both became saturated with water. However, 10 minutes after the storm ended, the soils appeared as shown below.
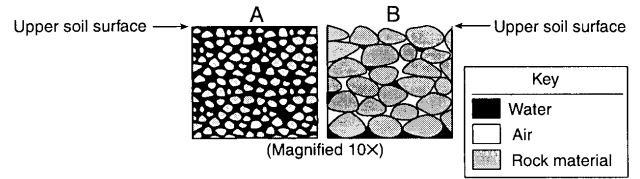

Which statement best explains the observed change in the water content of the soil samples?

1) The permeability of B is greater than the permeability of A.
2) The porosity of B is greater than the porosity of A.
3) The capillarity of B is greater than the capillarity of A.
4) The surface runoff at B is greater than the surface runoff at A.

62. The diagram below represents three identical beakers, *A, B,* and C, each containing an equal volume of uniform-sized spherical beads. Water is poured into each beaker until all of the pore spaces are filled.

—0.1-cm diameter   —0.4-cm diameter   —0.7-cm diameter

A   B   C
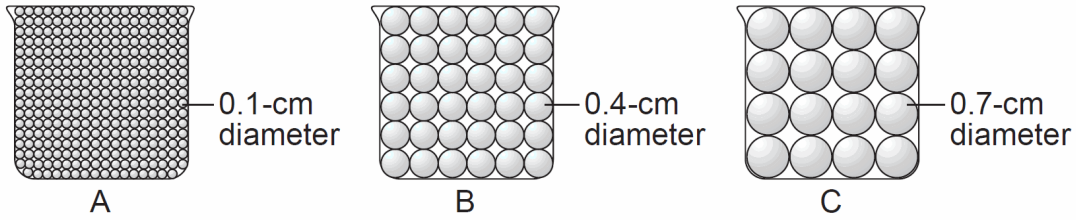
(Not drawn to scale)

Which table best indicates the percentage of pore space compared to the total volume of each beaker?

1)

Beaker	Percentage of Pore Space
A	40
B	40
C	40

2)

Beaker	Percentage of Pore Space
A	60
B	40
C	20

3)

Beaker	Percentage of Pore Space
A	20
B	40
C	60

4)

Beaker	Percentage of Pore Space
A	20
B	40
C	20

63. The diagrams below represent three containers, *A*, *B*, and *C*, which were filled with equal volumes of uniformly sorted plastic beads. Water was poured into each container to determine porosity and infiltration time.

(Not drawn to scale)
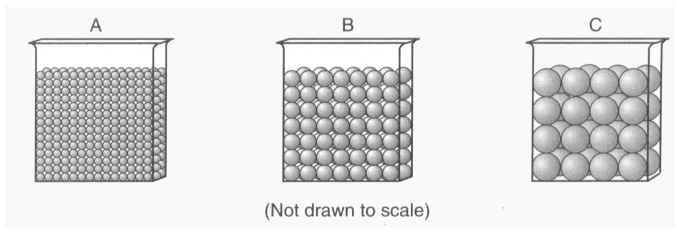
Which data table best represents the porosity and infiltration time of the beads in the three containers?

1)

Beaker	Porosity (%)	Infiltration Time (sec)
A	40	5.2
B	40	2.8
C	40	0.4

2)

Beaker	Porosity (%)	Infiltration Time (sec)
A	40	0.4
B	40	2.8
C	40	5.2

3)

Beaker	Porosity (%)	Infiltration Time (sec)
A	20	5.2
B	30	2.8
C	40	0.4

4)

Beaker	Porosity (%)	Infiltration Time (sec)
A	20	0.4
B	30	2.8
C	40	5.2

64. Which graph shows the general relationship between soil particle size and the capillarity of the soil?

1)

2)

3)

4)
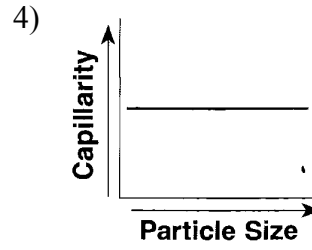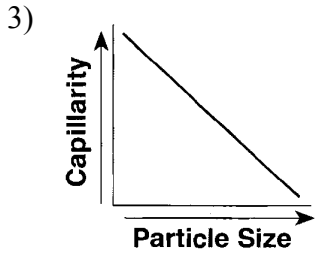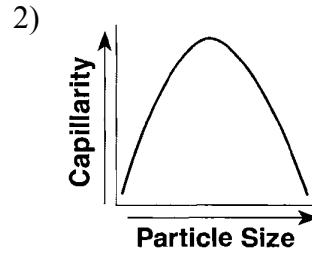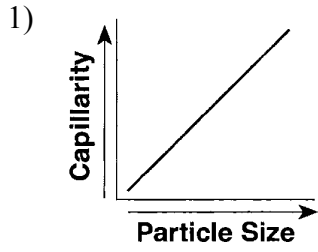
65. The diagram below shows a laboratory setup. The rubber band holds filter paper across the base of the open tube to hold the soil sample. The tube was placed in the water as shown. The upward movement of water is represented by arrows. The height of the water that moved upward within the soil was measured. Students repeated this procedure using soils with different particle sizes. Results of the experiment are shown in the data table.
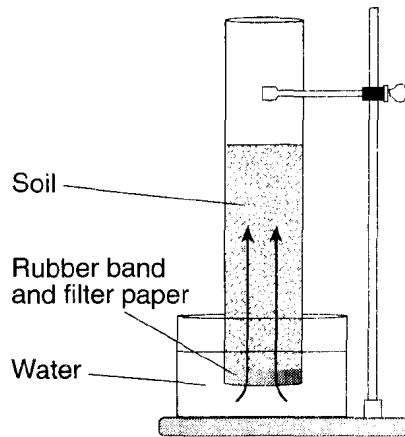

Data Table

Average Soil Particle Diameter (cm)	Height of Water in Column (cm)
0.006	30.0
0.2	8.0
1.0	0.5

Results of this experiment lead to the conclusion that

1) capillarity is greater in soils with larger particles
2) capillarity is greater in soils with smaller particles
3) permeability is greater in soils with larger particles
4) permeability is greater in soils with smaller particles

66. Base your answer to the following question on the diagrams below, which 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.

Silt
A

Fine Sand
B

Coarse Sand
C

Pebbles
D

(Not drawn to scale)
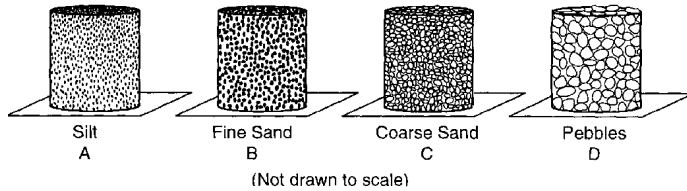
The sample in which container would have the greatest capillarity when placed in water?

1) *A*   2) *B*   3) *C*   4) *D*

67. Base your answer to the following question on the diagram of the water cycle below. Letter *A* represents a process in the water cycle. Points *X* and *Y* represent locations on Earth's surface.
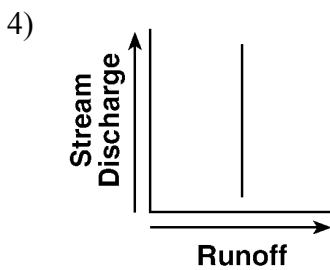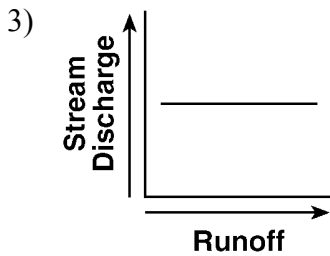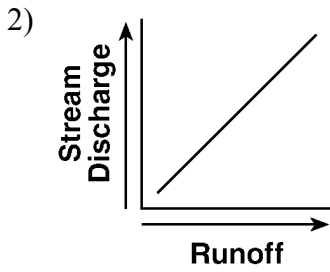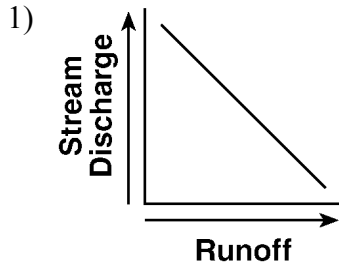
Water Cycle
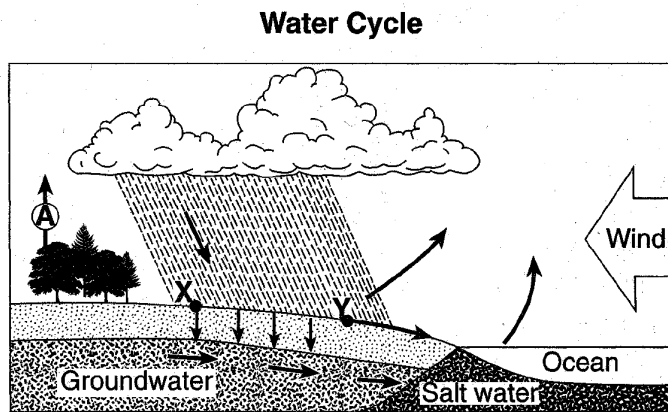
The amount of runoff at *Y* will increase as the

1) slope of the land decreases
2) porosity of the soil increases
3) evaporation rate exceeds the infiltration rate
4) precipitation rate exceeds the infiltration rate

68. Which graph best represents the relationship between surface-water runoff and stream discharge?

1)

2)

3)

4)

69. Which condition would cause surface runoff to increase in a particular location?

1) covering a dirt road with pavement
2) reducing the gradient of a steep hill
3) planting grasses and shrubs on a hillside
4) having a decrease in the annual rainfall

70. The cross section below represents a forested area in Vermont.
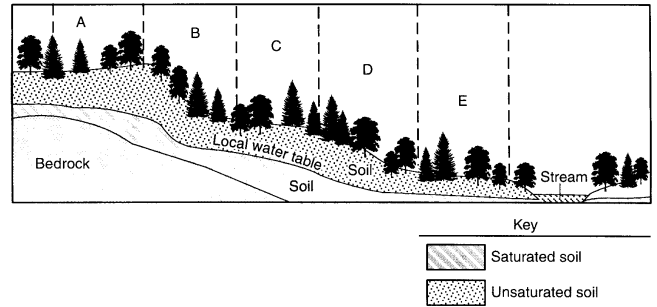
During heavy rainfall, the greatest amount of runoff should occur in which two sections of the forest?

1) *A* and *B*   2) *B* and *D*
3) *C* and *E*   4) *D* and *E*

71. Base your answer to the following question on the cross section below, which represents part of Earth's water cycle. Letters *A, B, C,* and *D* represent processes that occur during the cycle. The level of the water table and the extent of the zone of saturation are shown.
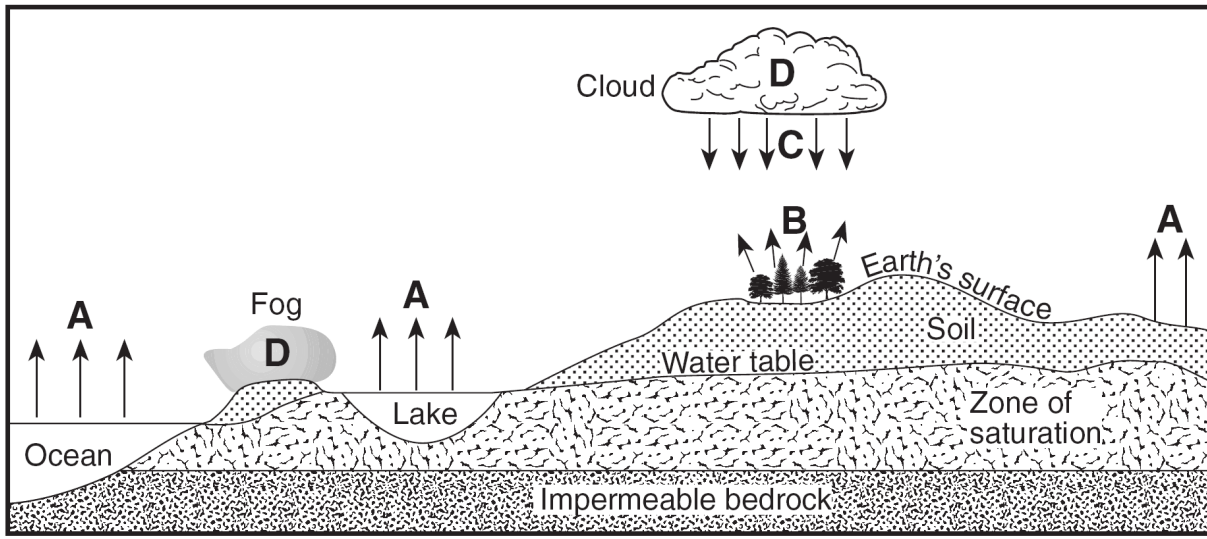
Which two letters represent processes in the water cycle that usually cause a lowering of the water table?

1) *A* and *B*   2) *A* and *C*   3) *B* and *D*   4) *C* and *D*

Base your answers to questions **72** and **73** on the two graphs below, which show the relationship between the amount of rainfall during a storm and the amount of discharge into a nearby stream. Letter *A* represents the time when approximately 50% of the precipitation from the storm has fallen. Letter *B* represents the time when peak runoff from the storm is flowing into the stream. The delay is the difference in time between letters *A* and *B* on the graph. Graph I shows data before urbanization in an area. Graph II shows data after urbanization in the same area.
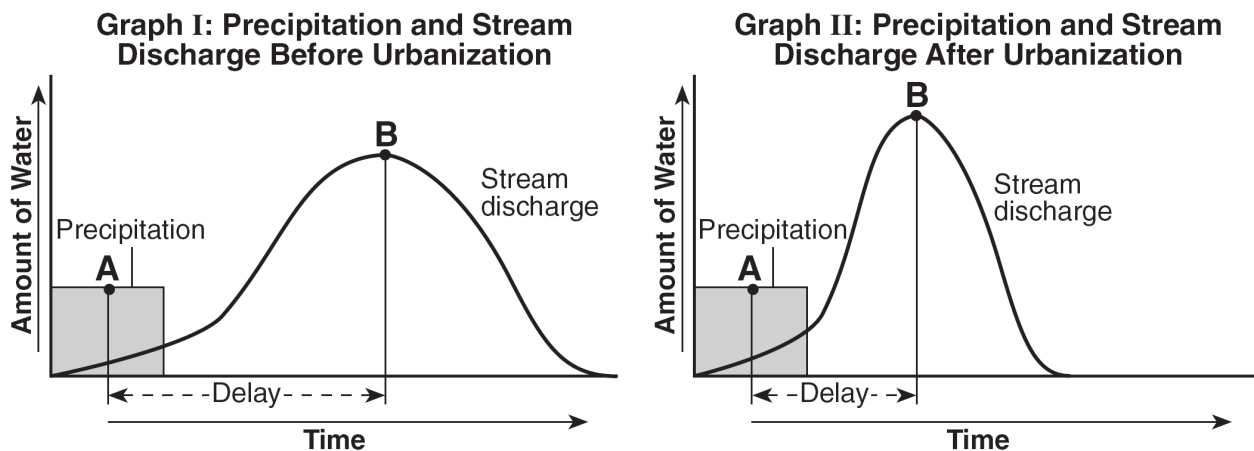
72. How did urbanization affect delay time between points *A* and *B* and the maximum stream discharge?

1) The delay time decreased, and the maximum discharge decreased.
2) The delay time decreased, and the maximum discharge increased.
3) The delay time increased, and the maximum discharge decreased.
4) The delay time increased, and the maximum discharge increased.

73. The delay time between points *A* and *B* on both graphs is due mainly to the time needed for

1) groundwater to evaporate
2) precipitation water to move into the streams
3) green plants to absorb precipitation
4) rainfall rate to decrease

74. During a dry summer, the flow of most large New York State streams generally

1) continues because some groundwater seeps into the streams
2) increases due to greater surface runoff
3) remains unchanged due to transpiration from grasses, shrubs, and trees
4) stops completely because no water runs off into the streams

75. The table below shows the relationship between total yearly precipitation (P) and potential evapotranspiration (EP) for different types of climates.

Climate Classification

Climate Type	Total Yearly P/E_p Ratio
Humid	Greater than 1.2
Subhumid	0.8 to 1.2
Semiarid	0.4 to 0.8
Arid	Less than 0.4

The total yearly precipitation (P) for a city in Texas is 218 millimeters. The total yearly potential evapotranspiration (EP) is 951 millimeters. Which type of climate does this city have?

1) humid   2) subhumid
3) semiarid   4) arid

76. The water table usually rises when there is

1) a decrease in the amount of infiltration
2) a decrease in the amount of surface area covered by vegetation
3) an increase in the amount of precipitation
4) an increase in the slope of the land

77. An area with a high potential for evapotranspiration has little actual evapotranspiration and precipitation. The climate of this area is best described as

1) hot and arid   2) hot and humid
3) cold and arid   4) cold and humid

78. Two locations, one in northern Canada and one in the southwestern United States, receive the same amount of precipitation each year. The location in Canada is classified as a humid climate. Why would the location in the United States be classified as an arid climate?

1) The yearly distribution of precipitation is different.
2) The soil-moisture storage in the southwestern United States is more than that in northern Canada.
3) The potential evapotranspiration is greater in the southwestern United States than in northern Canada.
4) The vegetation of the southwestern United States is different from that of northern Canada.

79. Which climate conditions are typical of regions near the North Pole and the South Pole?

1) low temperature and low precipitation
2) low temperature and high precipitation
3) high temperature and low precipitation
4) high temperature and high precipitation

80. The diagram below shows two identical containers filled with uniform particles that were sorted by size.
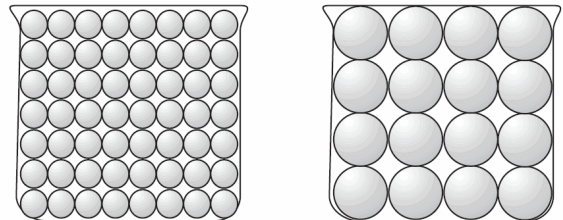
Which characteristic is most likely the same for these particle-filled containers?

1) infiltration rate   2) water retention
3) capillarity   4) porosity

81. The weather satellite image below shows two large
    swirl-shaped cloud formations, labeled *A* and *B*,
    over the Pacific Ocean.
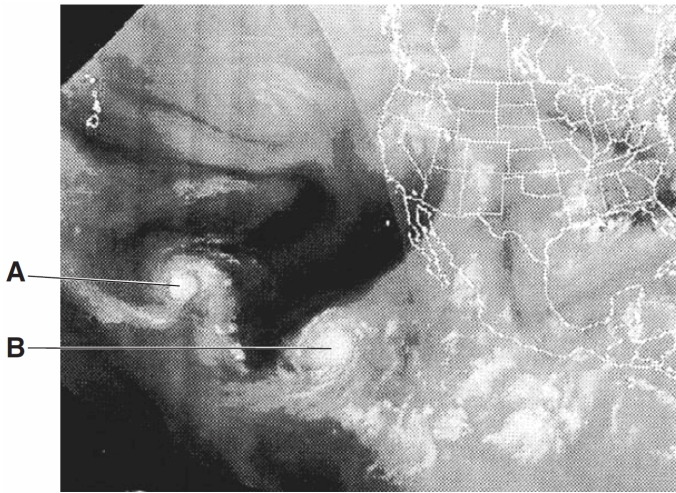
These large swirl-shaped cloud formations most
likely represent

1) polar air masses   2) warm fronts
3) tornadoes   4) hurricanes

Base your answers to questions **82** through **85** on the satellite image below, which shows a Northern
Hemisphere hurricane.
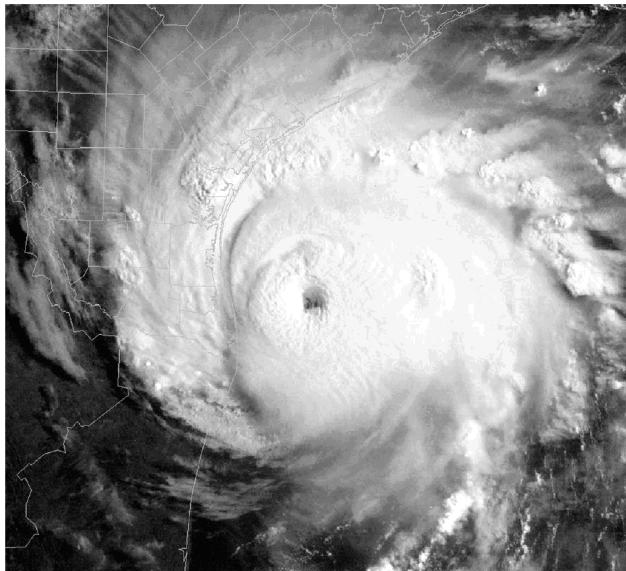
82. When the eye of this hurricane reaches 43° N latitude, this hurricane will most likely be pushed by
    planetary winds toward the

    1) northwest   2) northeast   3) southwest   4) southeast

83. Clouds form in the hurricane because the air is

    1) sinking, expanding, and cooling   2) sinking, compressing, and warming
    3) rising, expanding, and cooling   4) rising, compressing, and warming

84. Which air mass is normally associated with the formation of hurricanes?

    1) continental tropical   2) maritime tropical

    3) continental polar   4) maritime polar

85. What is the usual surface wind pattern around the eye of Northern Hemisphere hurricanes?

    1) clockwise and outward   2) clockwise and inward

    3) counterclockwise and outward   4) counterclockwise and inward