The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING
EARTH SCIENCE

Thursday, August 14, 2014 — 12:30 to 3:30 p.m., only

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Use your knowledge of Earth science to answer all questions in this examination. Before you begin this examination, you must be provided with the *2011 Edition Reference Tables for Physical Setting/Earth Science*. You will need these reference tables to answer some of the questions.

You are to answer all questions in all parts of this examination. You may use scrap paper to work out the answers to the questions, but be sure to record your answers on your answer sheet and in your answer booklet. A separate answer sheet for Part A and Part B–1 has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet. Record your answers to the Part A and Part B–1 multiple-choice questions on this separate answer sheet. Record your answers for the questions in Part B–2 and Part C in your separate answer booklet. Be sure to fill in the heading on the front of your answer booklet.

All answers in your answer booklet should be written in pen, except for graphs and drawings, which should be done in pencil.

When you have completed the examination, you must sign the declaration printed on your separate answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet and answer booklet cannot be accepted if you fail to sign this declaration.

Notice . . .

A four-function or scientific calculator and a copy of the *2011 Edition Reference Tables for Physical Setting/Earth Science* must be available for you to use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part A

Answer all questions in this part.

Directions (1–35): For *each* statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science.* Record your answers on your separate answer sheet.

1 Which evidence best supports the theory that the universe was created by an explosion called the Big Bang?

(1) impact craters found on Earth
(2) cosmic background radiation
(3) the different compositions of terrestrial and Jovian planets
(4) the blue shift of light from distant galaxies

2 Which star is more massive than our Sun, but has a lower surface temperature?

(1) *40 Eridani B*
(2) *Sirius*
(3) *Aldebaran*
(4) *Barnard's Star*

3 Which color of visible light has the *shortest* wavelength?

(1) violet
(2) green
(3) yellow
(4) red

4 The table below shows the times of ocean high tides and low tides on a certain date at a New York State location.

Ocean Tides

Type of Tide	Time
high	4:45 a.m.
low	10:58 a.m.
high	5:15 p.m.
low	11:22 p.m.

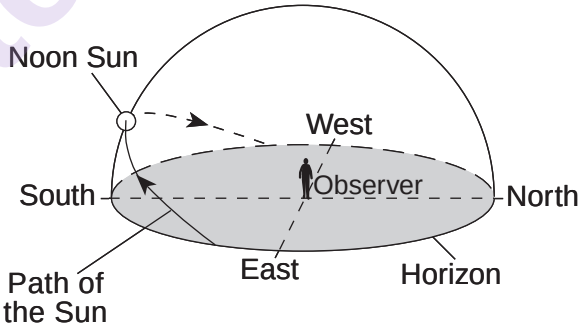
At approximately what time on the following day did the next high tide occur at this location?

(1) 4:40 a.m.
(2) 5:40 a.m.
(3) 4:40 p.m.
(4) 5:40 p.m.

5 The best evidence of Earth's rotation is provided by the

(1) shape of Earth's orbit
(2) shape of the Milky Way galaxy
(3) changes in the total yearly duration of insolation at a location on Earth
(4) apparent changes in the direction of swing of a Foucault pendulum

6 The model below shows the apparent path of the Sun as seen by an observer in New York State on the first day of one of the four seasons.



This apparent path of the Sun was observed on the first day of

(1) spring
(2) summer
(3) fall
(4) winter

7 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

8 During which phase change does water release the most heat energy?

(1) freezing
(2) melting
(3) condensation
(4) vaporization

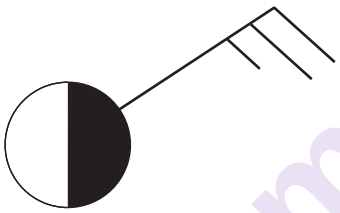
9 What is the average air pressure exerted by Earth's atmosphere at sea level, expressed in millibars and inches of mercury?

(1) 1013.25 mb and 29.92 in of Hg
(2) 29.92 mb and 1013.25 in of Hg
(3) 1012.65 mb and 29.91 in of Hg
(4) 29.91 mb and 1012.65 in of Hg

10 Which two processes lead to cloud formation in rising air?

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

11 The weather station model below shows some of the weather data for a certain location.



What is the wind speed shown on the station model and which instrument is used to measure the wind speed?

(1) 15 knots, measured by a wind vane
(2) 15 knots, measured by an anemometer
(3) 25 knots, measured by a wind vane
(4) 25 knots, measured by an anemometer

12 If air has a dry-bulb temperature of 2°C and a wet-bulb temperature of –2°C, what is the relative humidity?

(1) 11%
(2) 20%
(3) 36%
(4) 67%

13 Which current has a cooling effect on the climate of the west coast of South America?

(1) Falkland Current
(2) Peru Current
(3) Benguela Current
(4) Brazil Current

14 Near which two latitudes are most of Earth's dry climate regions found?

(1) 0° and 60° N
(2) 0° and 30° S
(3) 30° N and 60° N
(4) 30° N and 30° S

15 Which event followed a massive volcanic eruption and led to the cooling of global temperatures?

(1) thunderstorms that developed near the eruption
(2) the release of carbon dioxide and methane gases
(3) the outflow of magma over Earth's surface
(4) the addition of ash particles into the atmosphere

16 Rifting of tectonic plates in eastern North America during the Jurassic Period was responsible for the

(1) formation of the Catskill delta
(2) first uplift of the Adirondack Mountains
(3) Alleghenian orogeny
(4) opening of the Atlantic Ocean

17 The surface bedrock of Mt. Marcy, New York, is composed primarily of which rock?

(1) anorthosite
(2) marble
(3) quartzite
(4) hornfels

18 Much of the evidence for the evolution of life-forms on Earth has been obtained by

(1) studying the life spans of present-day animals
(2) radioactive dating of metamorphic rock
(3) correlating widespread igneous ash deposits
(4) examining fossils preserved in the rock record

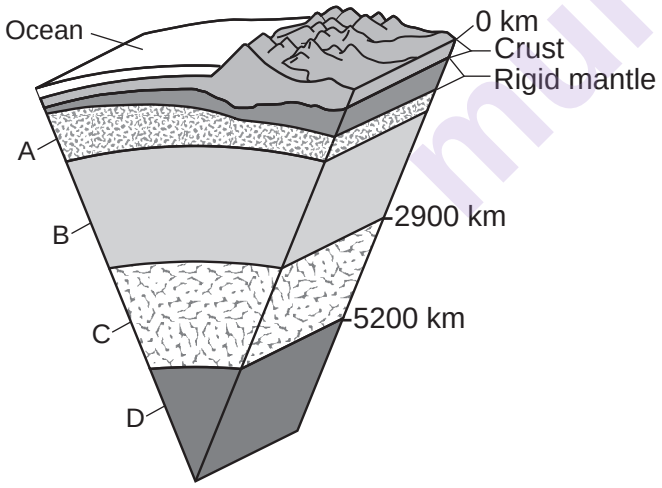
19 The table below shows the radioactive decay of carbon-14. Part of the table has been left blank.

Half-Life	Original Carbon-14 Remaining (%)	Number of Years
0	100	0
1	50	5,700
2	25	11,400
3		17,100
4		
5		

After 22,800 years, approximately what percentage of the original carbon-14 remains?

(1) 15%
(2) 12.5%
(3) 6.25%
(4) 3.125%

20 The diagram below represents a model of Earth's surface and internal structure. Letters *A*, *B*, *C*, and *D* represent four different layers. Some depths below Earth's surface are shown.



(Not drawn to scale)

Which Earth layer is inferred to be composed of solid nickel and iron?

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

21 Oceanic crust is sliding beneath the Aleutian Islands in the North Pacific Ocean, forming the Aleutian Trench at a

(1) convergent plate boundary between the Pacific Plate and the North American Plate
(2) convergent plate boundary between the Pacific Plate and the Juan de Fuca Plate
(3) divergent plate boundary between the Pacific Plate and the North American Plate
(4) divergent plate boundary between the Pacific Plate and the Juan de Fuca Plate

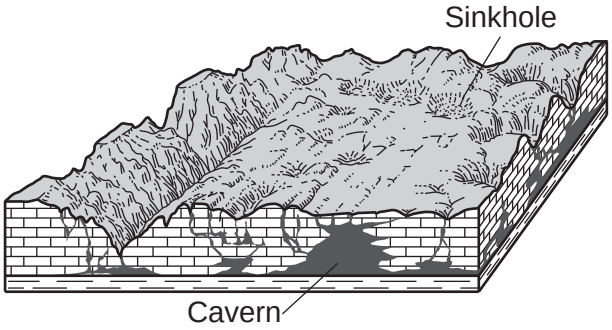
22 Which New York State landscape region is composed of mostly horizontal sedimentary bedrock and has a high elevation?

(1) Hudson Highlands
(2) Manhattan Prong
(3) the Catskills
(4) Taconic Mountains

23 Which mineral is commonly mined as a source of the element lead (Pb)?

(1) galena
(2) quartz
(3) magnetite
(4) gypsum

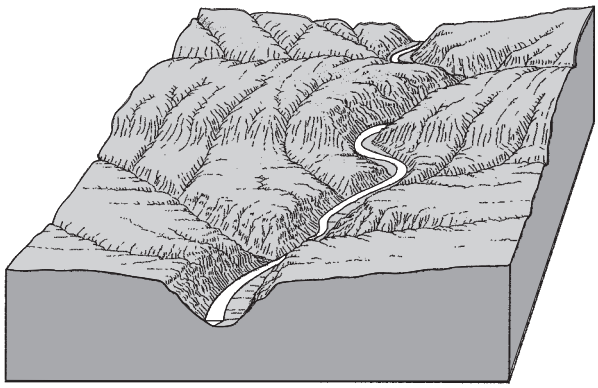
24 The block diagram below represents a landscape where caverns and sinkholes have gradually developed over a long period of time.



Why did these caverns and sinkholes form?

(1) The bedrock chemically reacted with acidic groundwater.
(2) This type of bedrock contained large amounts of oxygen and silicon.
(3) Glacial deposits altered the shape of the bedrock.
(4) Crustal uplift formed gaps in the bedrock.

25 The block diagram below represents a stream flowing from a mountain region.



A brief, heavy rainstorm occurs in the mountains. How will the volume of water and the rate of erosion in the stream change shortly after the rainstorm?

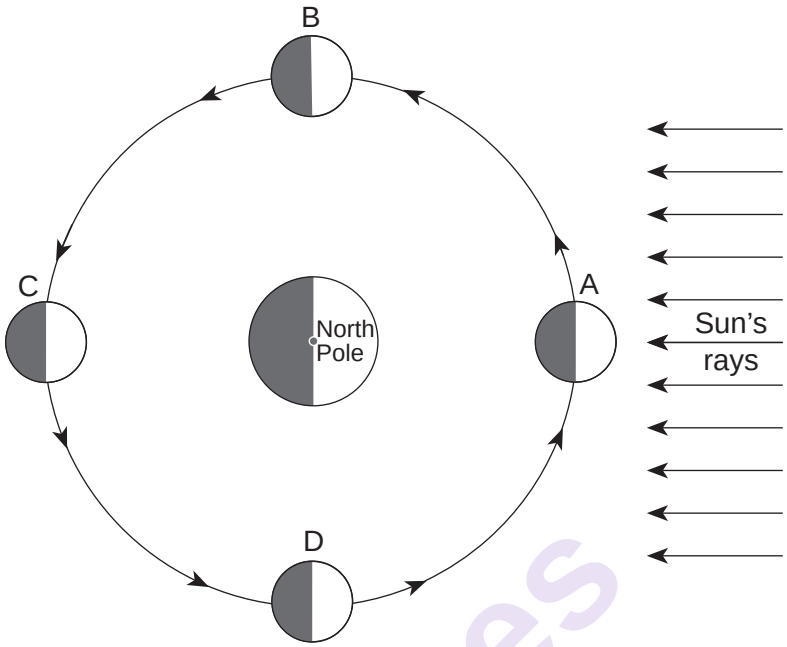
(1) The volume of water will decrease and the rate of erosion will increase.
(2) The volume of water will increase and the rate of erosion will decrease.
(3) Both the volume of water and the rate of erosion will decrease.
(4) Both the volume of water and the rate of erosion will increase.

26 The photograph below shows scratched and polished bedrock produced by weathering and erosion.

Which agent of erosion most likely carried sediment that scratched and polished this bedrock surface?

(1) a moving glacier
(2) running water
(3) wave action
(4) wind

Base your answers to questions 27 and 28 on the diagram below and on your knowledge of Earth science. The diagram represents the Moon at different positions, labeled *A*, *B*, *C*, and *D*, in its orbit around Earth.



(Not drawn to scale)

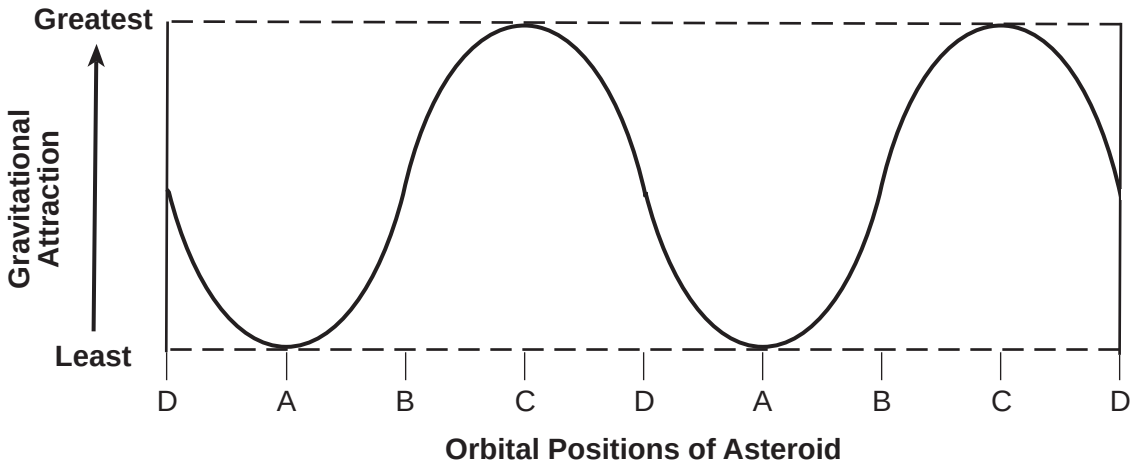
27 At which two Moon positions would an observer on Earth most likely experience the highest high tides and the lowest low tides?

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

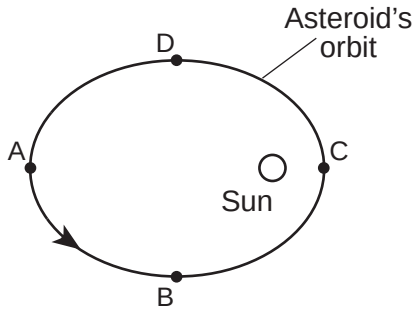
28 During which Moon phase could an observer on Earth see a lunar eclipse occur?

(1) (2) (3) (4)

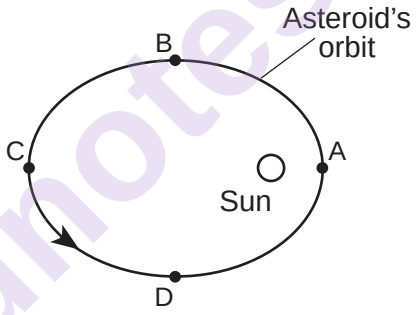
29 The graph below shows the varying amount of gravitational attraction between the Sun and an asteroid in our solar system. Letters *A*, *B*, *C*, and *D* indicate four positions in the asteroid's orbit.



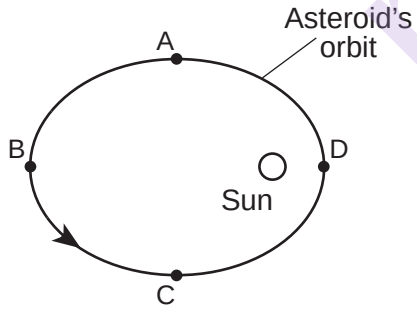
Which diagram best represents the positions of the asteroid in its orbit around the Sun? [Note: The diagrams are not drawn to scale.]



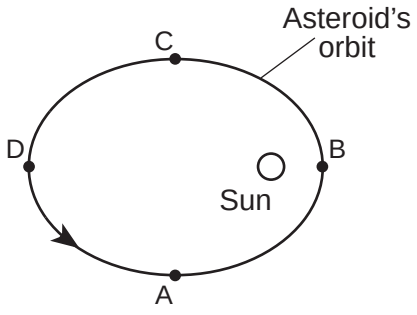
(1)



(3)

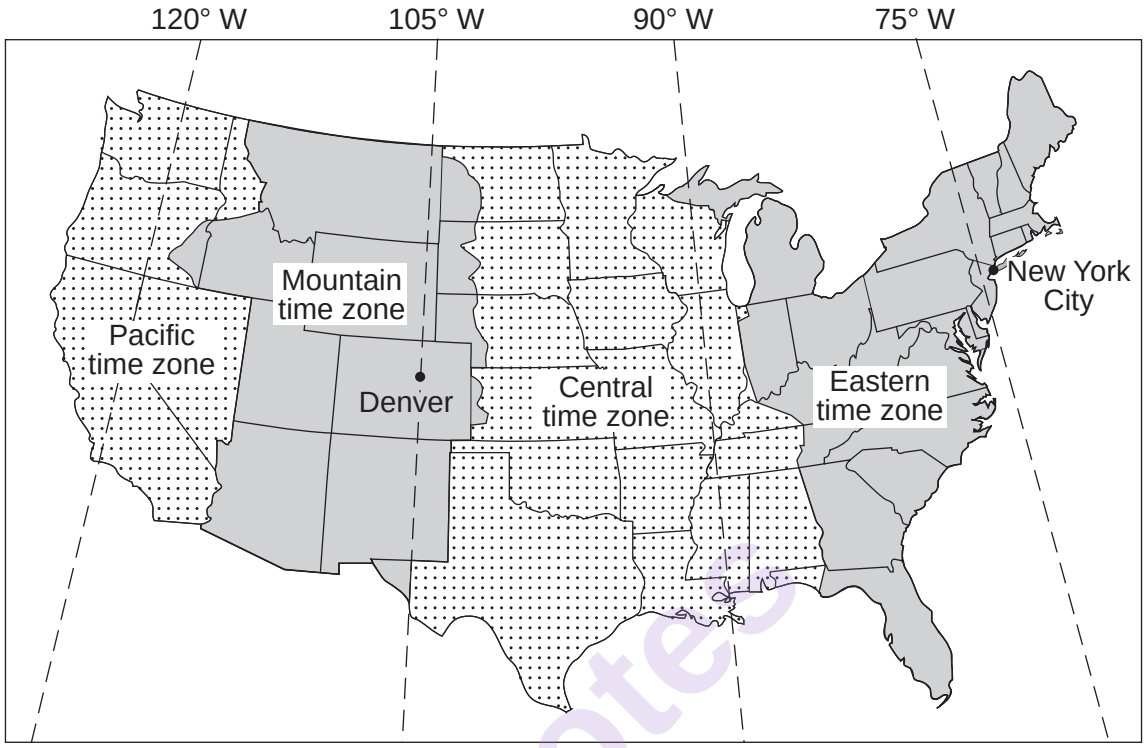


(2)



(4)

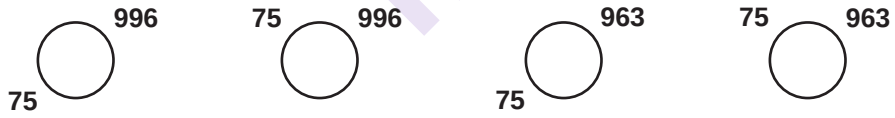
30 The map below shows four major time zones of the United States. The dashed lines represent meridians of longitude. The locations of New York City and Denver are shown.



What is the time in New York City when it is noon in Denver?

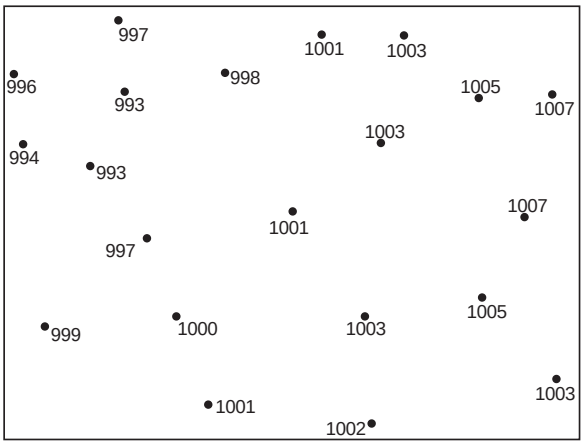
(1) 10 a.m.
(2) 2 p.m.
(3) 3 p.m.
(4) noon

31 Which station model shows an air temperature of 75°F and a barometric pressure of 996.3 mb?

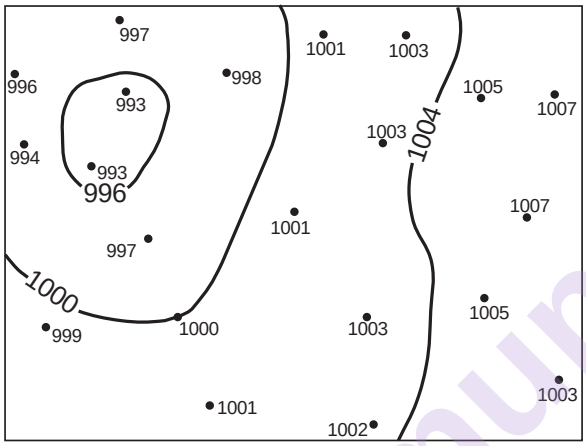


(1) (2) (3) (4)

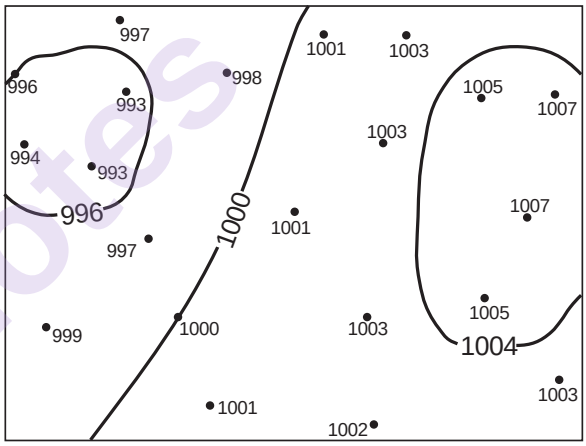
32 The map below shows air pressures recorded in millibars (mb).



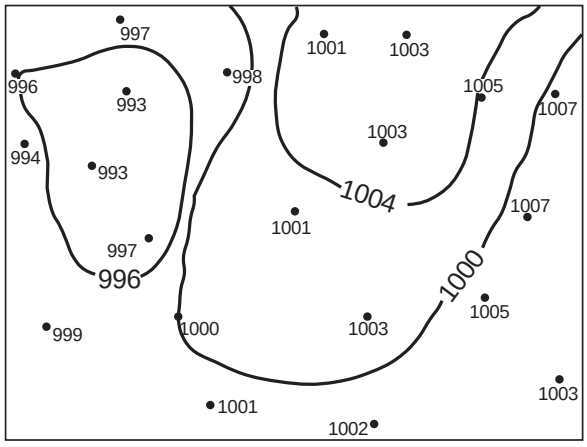
Which map shows the correct location of the 996-mb, 1000-mb, and 1004-mb isobars?



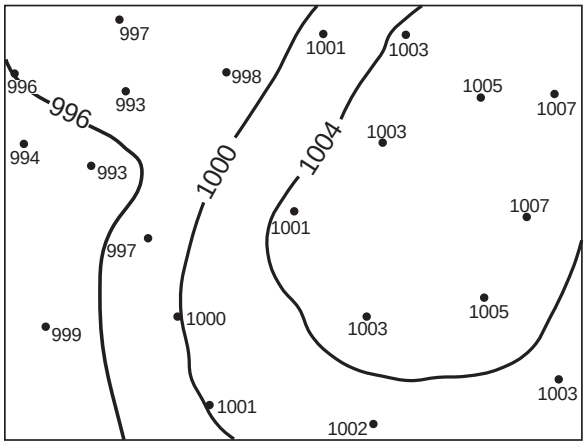
(1)



(3)

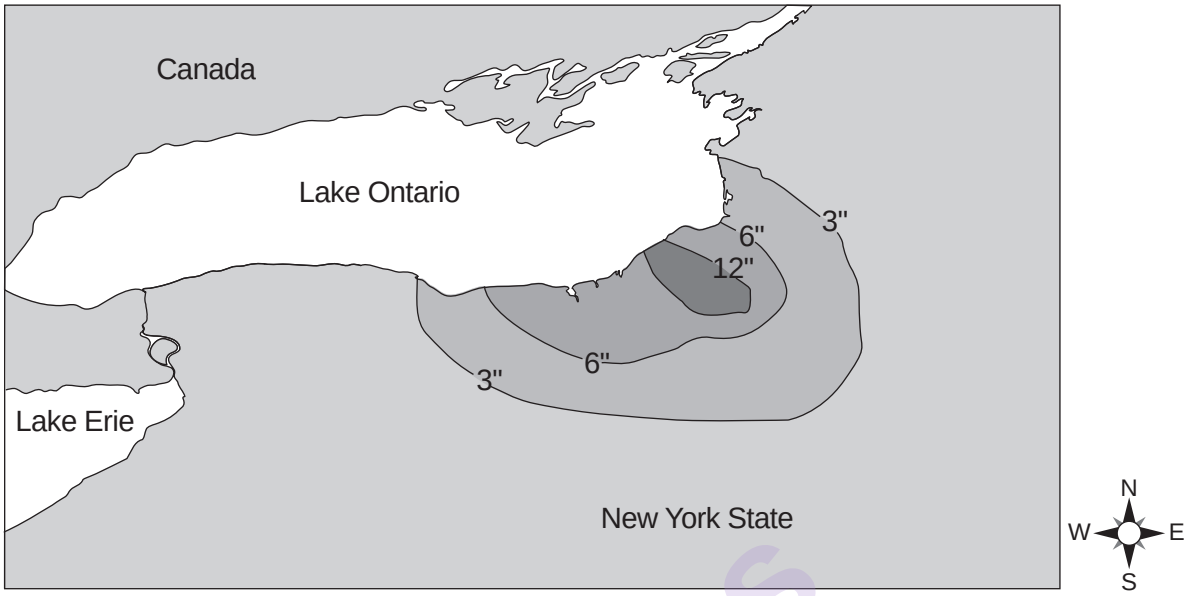


(2)



(4)

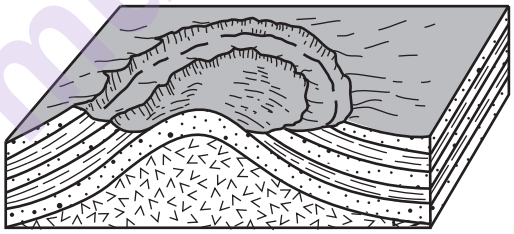
33 The map below shows the amount of snowfall, in inches, produced by a lake-effect snowstorm in central New York State.



The wind that produced this snowfall pattern most likely came from the

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

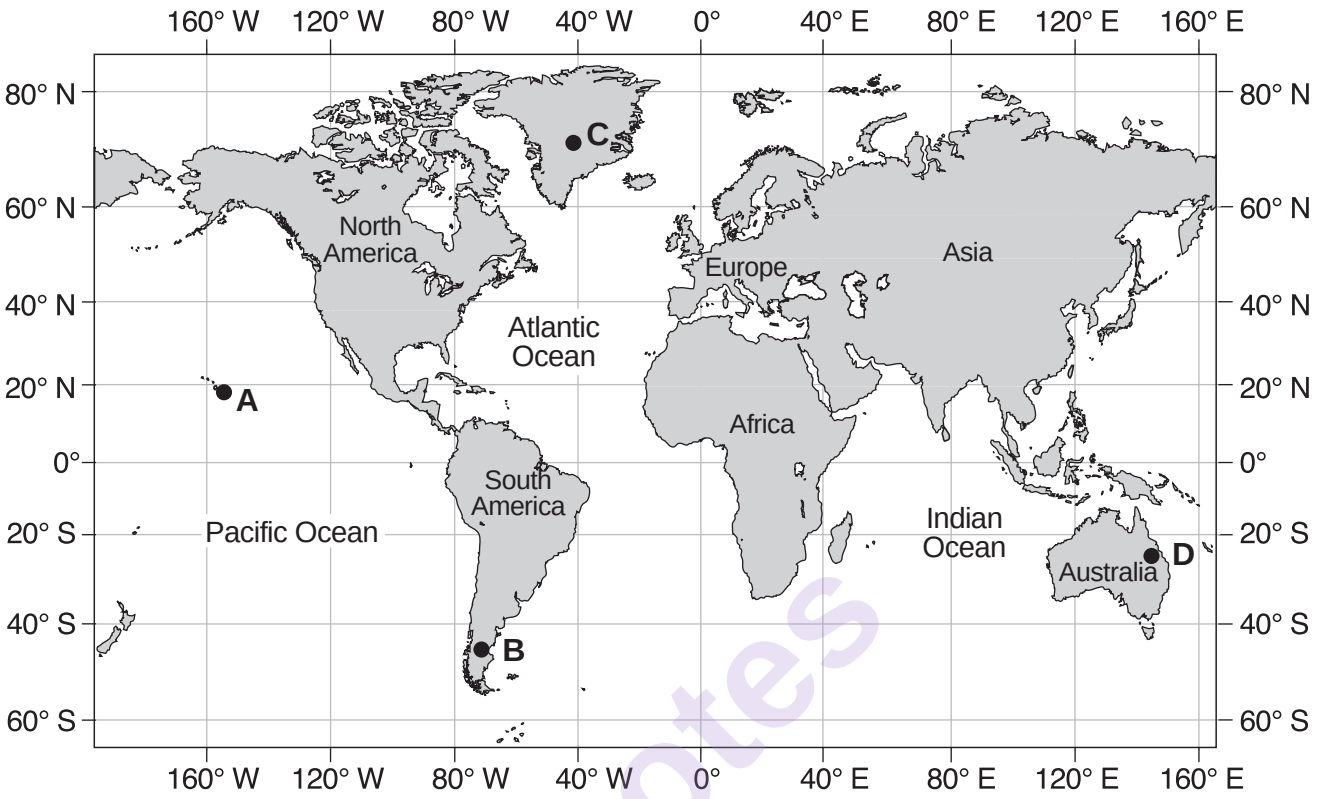
34 The block diagram below represents an igneous dome that uplifted overlying rock layers, which were then weathered and eroded.



Which stream drainage pattern is most likely found on the surface of the area represented by the block diagram?

(1) (2) (3) (4)

35 On the map below, points *A* through *D* represent locations on Earth's surface.



Which location is positioned over a mantle hot spot?

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

Part B–1

Answer all questions in this part.

Directions (36–50): For *each* statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science.* Record your answers on your separate answer sheet.

Base your answers to questions 36 and 37 on the data table below and on your knowledge of Earth science. The data table shows information on six major mass extinction events that occurred many million years ago (mya) in Earth's history.

Some Major Mass Extinctions in Earth's History

Approximate Time (mya)	**Certain Life-Forms That Became Extinct**
65.5	all dinosaurs and all ammonoids
200	many species of nautiloids, ammonoids, mammal-like reptiles, and early dinosaurs
251	all trilobites and 90% of other marine species and 70% of land species
376	many species of corals, brachiopods, and trilobites
444	more than half of brachiopod species, many trilobite species, and some coral species
520	small shelly fossil species and some early trilobite species

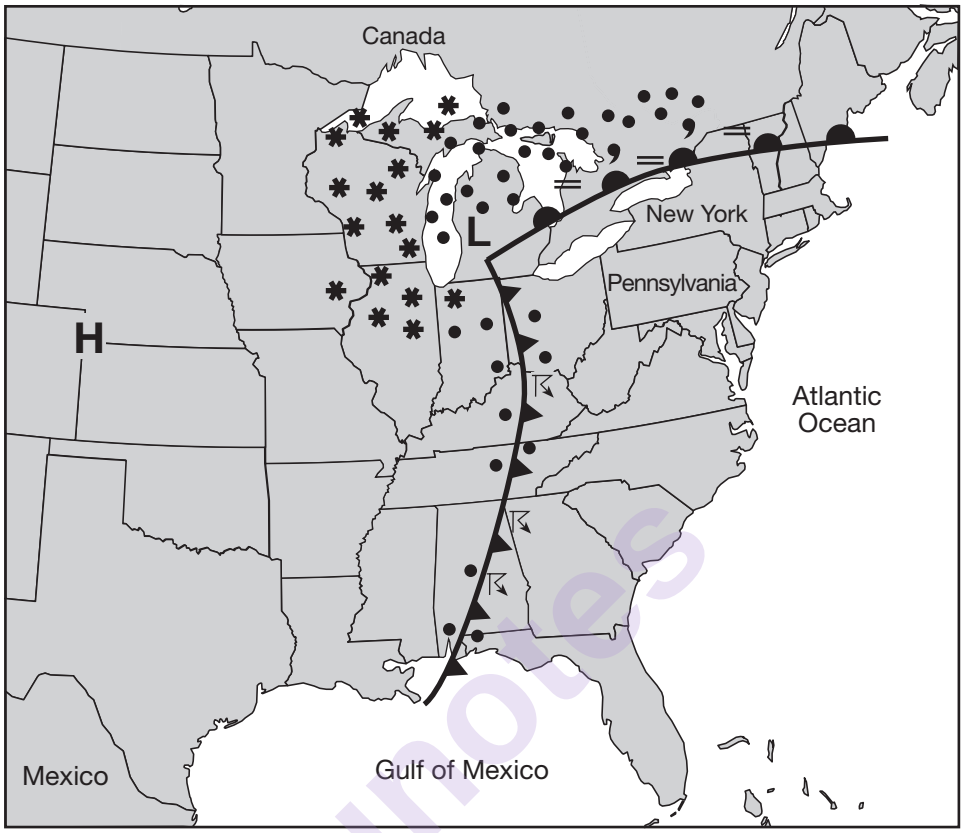
36 More than half of brachiopod species became extinct at the end of the

(1) Devonian Period
(2) Silurian Period
(3) Ordovician Period
(4) Cambrian Period

37 Which event is generally accepted as the cause of the mass extinction that occurred 65.5 million years ago?

(1) volcanic eruption
(2) continental collision
(3) asteroid impact
(4) sea-level change

Base your answers to questions 38 through 40 on the weather map below and on your knowledge of Earth science. The map of a portion of eastern North America shows a high-pressure center (**H**) and a low-pressure center (**L**), frontal boundaries, and present weather conditions.



38 Which weather condition is shown along the cold front?

(1) fog
(2) snow
(3) haze
(4) thunderstorms

39 What was the most likely source region for the air mass over Pennsylvania?

(1) New York State
(2) Pacific Ocean
(3) Gulf of Mexico
(4) Canada

40 The general surface wind circulation associated with the high-pressure center (**H**) is most likely

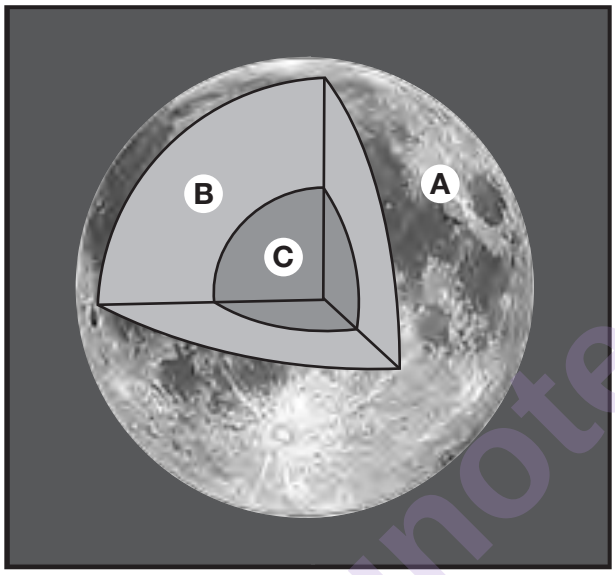
(1) clockwise and outward
(2) clockwise and inward
(3) counterclockwise and outward
(4) counterclockwise and inward

Base your answers to questions 41 through 43 on the passage and diagram below and on your knowledge of Earth science. The passage describes geologic studies of the Moon. The diagram represents the Moon's surface and interior, showing the inferred depth of each layer below the Moon's surface.

Moon Studies

Scientific instruments left on the Moon's surface recorded 12,558 moonquakes in eight years. Most of these moonquakes originated between 700 km and 1200 km below the Moon's surface. Scientists infer that most moonquakes are caused by the gravitational forces between the Moon, Earth, and the Sun.

Layers of the Moon



Key
Inferred Depth Below the Surface:
A Crust: 0 km to 60 km
B Mantle: 60 km to 1100 km
C Core: 1100 km to 1738 km

(Not drawn to scale)

41 The same type of evidence was used to find the inferred depths of both the Moon's interior layers and Earth's interior layers. What evidence was used to determine the inferred depth of the boundary between the Moon's mantle and core?

(1) seismic data recorded on the Moon's surface
(2) magnetic data measured on the Moon's surface
(3) convection currents mapped in the Moon's mantle and core
(4) temperatures measured in the Moon's mantle and core

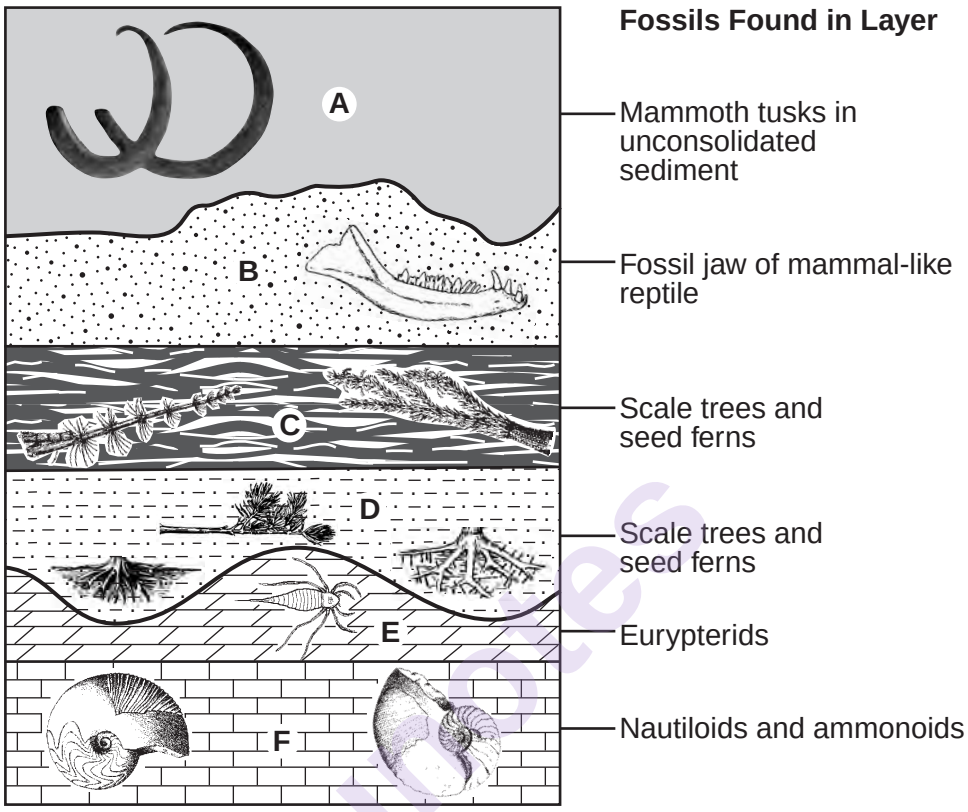
42 What is the inferred thickness of the Moon's mantle?

(1) 60 km
(2) 638 km
(3) 1040 km
(4) 1738 km

43 Which planet has an average density most similar to the average density of the Moon?

(1) Mercury
(2) Mars
(3) Jupiter
(4) Neptune

Base your answers to questions 44 through 47 on the geologic cross section below and on your knowledge of Earth science. The cross section represents rock and sediment layers, labeled *A* through *F*. Each layer contains fossil remains, which formed in different depositional environments. Some layers contain index fossils. The layers have *not* been overturned.



(Not drawn to scale)

44 Which pair of organisms existed when the unconsolidated sediment in layer *A* was deposited?

(1) birds and trilobites
(2) dinosaurs and mastodonts
(3) ammonoids and grasses
(4) humans and vascular plants

45 Which rock layer formed mainly from the compaction of plant remains?

(1) *E*
(2) *B*
(3) *C*
(4) *F*

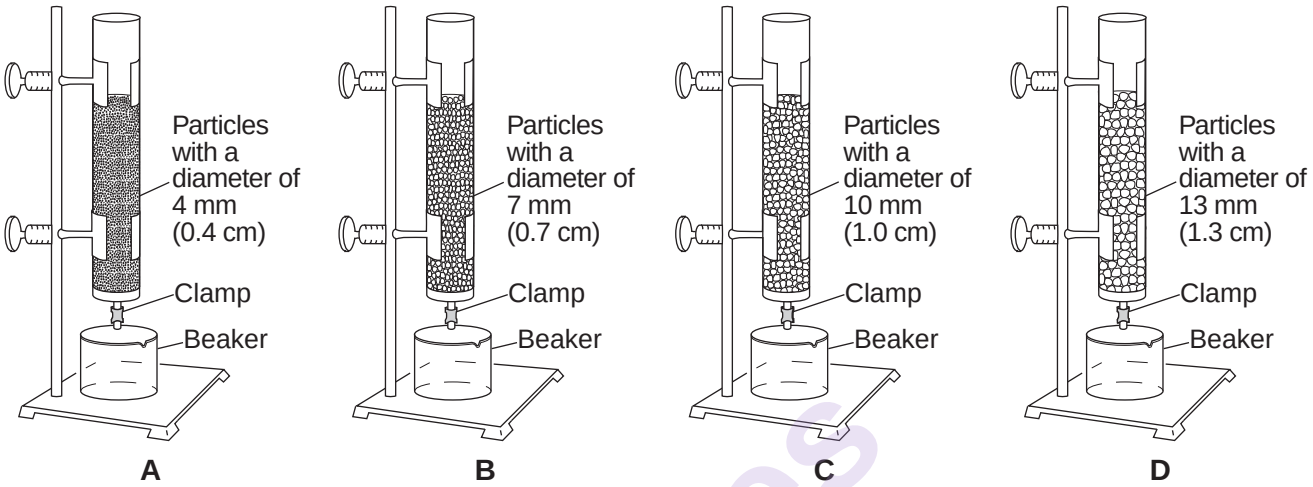
46 During which geologic epoch was layer *F* deposited?

(1) Late Devonian
(2) Middle Devonian
(3) Early Devonian
(4) Late Silurian

47 The depositional environment during the time these layers and fossils were deposited

(1) was consistently marine
(2) was consistently terrestrial (land)
(3) changed from marine to terrestrial (land)
(4) changed from terrestrial (land) to marine

Base your answers to questions 48 through 50 on the diagram below and on your knowledge of Earth science. The diagram represents setups of laboratory equipment, labeled *A*, *B*, *C*, and *D*. This equipment was used to test the infiltration rate and water retention of four different particle sizes. Each column was filled to the same level with uniform-sized dry, spherical particles. Water was poured into each column until the water level rose to the top of the particles. Then, the clamp was opened to allow the water to drain into the beaker beneath each column.

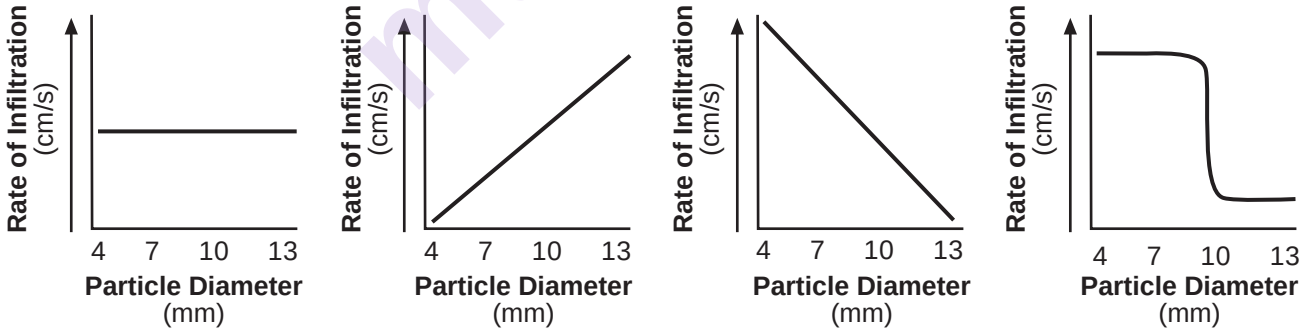


(Not drawn to scale)

48 All of the particles in these four columns are classified as

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

49 Which graph best shows the rate of infiltration of water through the particles in these four columns?



50 Which column of particles retained the most water after the clamps were opened and the water was drained into the beakers?

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

Part B–2

Answer all questions in this part.

Directions (51–65): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science*.

Base your answers to questions 51 through 54 on the cross section of part of Earth's crust in your answer booklet and on your knowledge of Earth science. On the cross section, some rock units are labeled with letters *A* through *I*. The rock units have *not* been overturned. Line *XY* represents a fault. Line *UV* represents an unconformity.

51 On the cross section *in your answer booklet*, draw *two* arrows, one on *each* side of line *XY*, to show the direction of relative movement that has occurred along the fault. [1]

52 Write the letter of the oldest rock unit in the cross section. [1]

53 Identify the contact metamorphic rock that formed between rock units *B* and *C*. [1]

54 The table below shows the ages of the igneous rock units, determined by radioactive dating.

Rock Unit	D	G	H	B
Age (million years)	420	454	420	140

How many million years ago did rock unit *I* most likely form? [1]

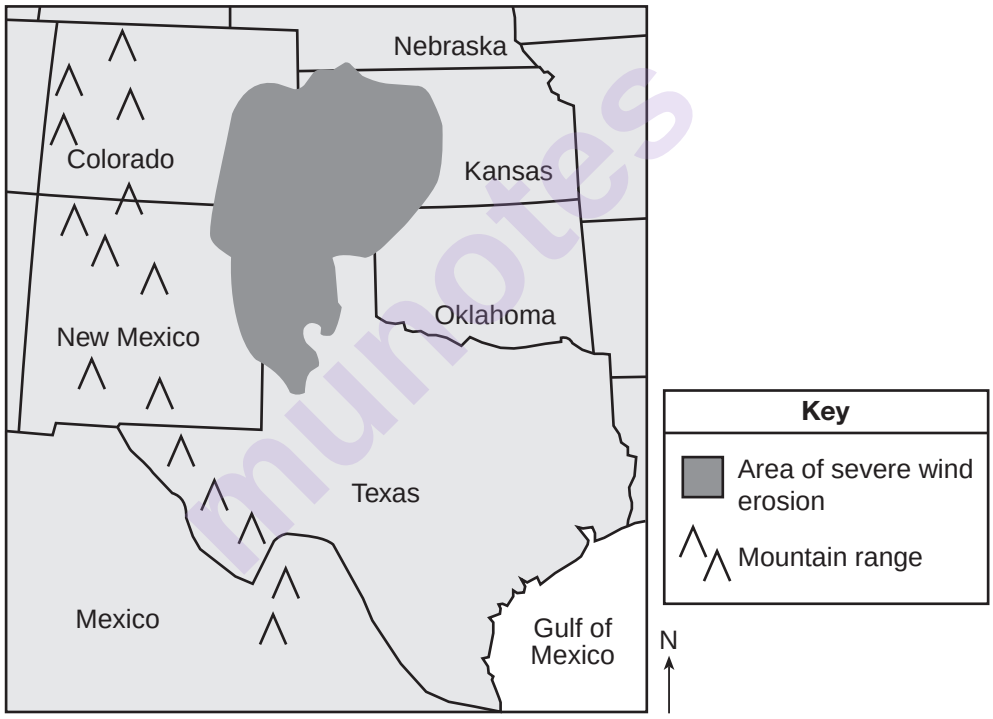
Base your answers to questions 55 through 58 on the passage and map below and on your knowledge of Earth science. The map shows a portion of the Dust Bowl in the southern Great Plains.

The Dust Bowl

In the 1930s, several years of drought affected over 100 million acres in the Great Plains from North Dakota to Texas. For several decades before this drought, farmers had plowed the prairie and loosened the soil. When the soil became extremely dry from lack of rain, strong prairie winds easily removed huge amounts of soil from the farms, forming dust storms. This region was called the Dust Bowl.

In the spring of 1934, a windstorm lasting a day and a half created a dust cloud nearly 2000 kilometers long and caused "muddy rains" in New York State and "black snow" in Vermont. Months later, a Colorado storm carried dust approximately 3 kilometers up into the atmosphere and transported it 3000 kilometers, creating twilight conditions at midday in New York State.

A Portion of the Dust Bowl in the Southern Great Plains



55 Identify *one* human activity that was a major cause of the huge dust storms that formed in the Great Plains during the 1930s. [1]

56 Describe *one* change in the appearance of the sand particles that were abraded when transported by winds within the Dust Bowl region. [1]

57 Identify the name of the layer of the atmosphere in which the dust particles were transported by the Colorado storm to New York State. [1]

58 Explain why the dust clouds that moved to the east coast of the United States during the 1934 storm were composed mostly of silt and clay particles instead of sand. [1]

Base your answers to questions 59 through 62 on the topographic map *in your answer booklet* and on your knowledge of Earth science. The map shows an area of New York State that includes a campsite, trail, and buildings near a lake. Points *A*, *B*, *C*, and *D* represent locations on the map.

59 Point *A* on the topographic map *in your answer booklet* indicates a certain elevation on the east side of the lake. Place an **X** at the same elevation on the west side of the lake. [1]

60 On the grid *in your answer booklet*, construct a topographic profile along line *BC*. Plot the elevation of *each* contour line that crosses line *BC*. Connect *all seven* plots with a line to complete the profile. [1]

61 *In your answer booklet*, circle the phrase that indicates the direction of flow of Woodland Brook. Describe the contour-line evidence that supports your answer. [1]

62 Campers hiked along the trail from the shoreline of the lake to point *D* to view the landscape. Determine the average gradient, in meters per kilometer, of the route they took on their hike. [1]

Base your answers to questions 63 through 65 on the diagram in your answer booklet and on your knowledge of Earth science. The diagram represents a model of Earth's orbit around the Sun. Arrows represent two motions of Earth. Distances from the center of the Sun to the center of Earth are indicated in kilometers. Earth is represented when it is closest to the Sun and when it is farthest from the Sun.

63 On the diagram *in your answer booklet*, place an **X** on Earth's orbit at *one* location where Earth's Northern Hemisphere is in winter. [1]

64 How many degrees is Earth's axis tilted to a line perpendicular to the plane of Earth's orbit? [1]

65 The diagram *in your answer booklet* represents Earth at one position in its orbit around the Sun. Starting at the North Pole, draw a straight arrow that points to the location of *Polaris*. [1]

Part C

Answer all questions in this part.

Directions (66–85): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Earth Science.*

Base your answers to questions 66 through 68 on the data table below and on the graph in your answer booklet and on your knowledge of Earth science. The data table lists the number of daylight hours for a location at 50° N on the 21st day of each month for 1 year. The graph shows the number of daylight hours on the 21st day of each month for a location at 70° N and for the equator, 0°.

Daylight Hours at 50° N

Date	Daylight (h)
January 21	8.4
February 21	10.0
March 21	12.0
April 21	13.8
May 21	15.5
June 21	16.2
July 21	15.5
August 21	14.0
September 21	12.0
October 21	10.2
November 21	8.4
December 21	7.5

66 On the graph *in your answer booklet*, plot the number of daylight hours for the 21st day of *each* month listed on the data table. Connect *all* of your plotted data with a line. [1]

67 Explain why the number of daylight hours for all three latitudes was 12 hours on March 21 and September 21. [1]

68 Predict the number of daylight hours that occur at 70° S on June 21. [1]

Base your answers to questions 69 through 71 on the data table below and on your knowledge of Earth science. The table shows air temperatures recorded under identical conditions at 2-hour intervals on a sunny day. Data were recorded 1 meter above ground level both inside and outside of a glass greenhouse.

Data Table

Time	Inside Air Temperature (°C)	Outside Air Temperature (°C)
8 a.m.	15	15
10 a.m.	18	16
12 noon	21	17
2 p.m.	24	18
4 p.m.	24	17

69 Describe the color and texture of the surfaces inside the greenhouse that would most likely absorb the greatest amount of visible light. [1]

70 Calculate the rate of change in the outside air temperature from 8 a.m. to 2 p.m. in Celsius degrees per hour. [1]

71 Most atmospheric scientists infer that global warming is occurring due to an increase in greenhouse gases. State the names of *two* greenhouse gases. [1]

Base your answers to questions 72 through 76 on the side-view model of the solar system in your answer booklet and on your knowledge of Earth science. The planets are shown in their relative order of distance from the Sun. Letter *A* indicates one of the planets.

72 The center of the asteroid belt is approximately 503 million kilometers from the Sun. *In your answer booklet*, draw an **X** on the model between two planets to indicate the center of the asteroid belt. [1]

73 State the period of rotation at the equator of planet *A*. Label your answer with the correct units. [1]

74 How many million years ago did Earth and the solar system form? [1]

75 Calculate how many times larger the equatorial diameter of the Sun is than the equatorial diameter of Venus. [1]

76 Identify the process that occurs within the Sun that converts mass into large amounts of energy. [1]

Base your answers to questions 77 through 80 on the diagram in your answer booklet and on your knowledge of Earth science. The diagram represents several common rock-forming minerals and some of the igneous rocks in which they commonly occur. The minerals are divided into two groups, *A* and *B*. Dashed lines connect the diagram of diorite to the three minerals that are commonly part of diorite's composition.

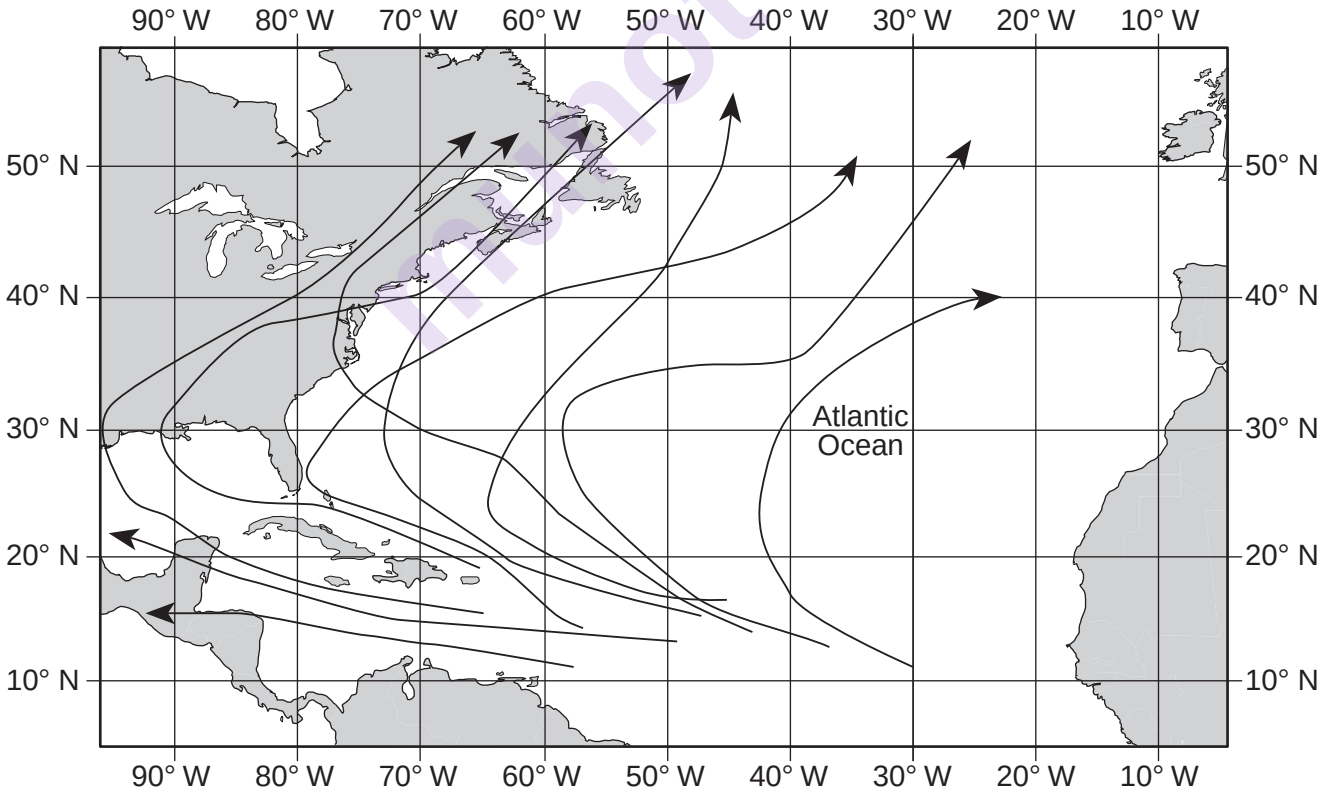
77 On the diagram *in your answer booklet*, draw *five* lines to connect the diagram of granite to the symbols of the minerals that are commonly part of granite's composition. [1]

78 Describe *one* characteristic of the minerals in group *A* that makes them different from the minerals in group *B*. [1]

79 Based on the *Earth Science Reference Tables*, identify *one* other mineral found in some samples of diorite that is *not* shown in the diorite sample in the diagram. [1]

80 A sedimentary rock sample has the same basic mineral composition as granite. Describe *one* observable characteristic of the sedimentary rock that is different from granite. [1]

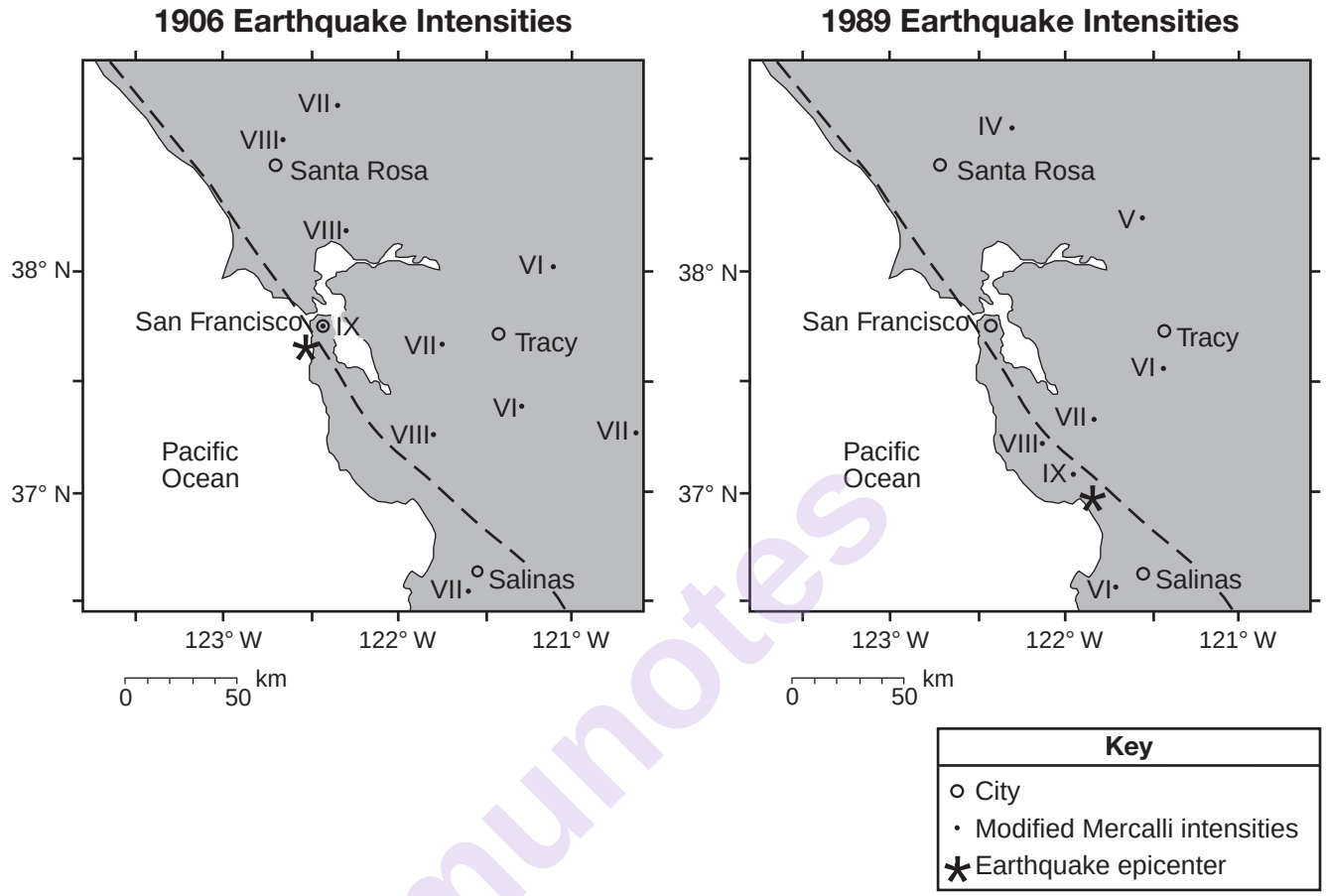
Base your answers to questions 81 and 82 on the Atlantic hurricane map below and on your knowledge of Earth science. The arrows on the map show the tracks of various hurricanes that occurred during late summer and early fall.



81 Describe *one* ocean surface condition or atmospheric condition that makes the area over the Atlantic Ocean between 10° N latitude and 20° N latitude ideal for these hurricanes to form. [1]

82 Several of these hurricanes have affected land areas. Describe *two* actions that people who live in hurricane-prone areas should take in order to prepare for future hurricanes. [1]

Base your answers to questions 83 through 85 on the maps and table below and on your knowledge of Earth science. The maps show earthquake intensities (IV to IX), according to the table of the Modified Mercalli Intensity Scale, for the 1906 and 1989 earthquakes at several locations in California. The asterisk (*) on each map is the location of each epicenter. The dashed line represents the location of a major fault.



Modified Mercalli Intensity Scale

Level of Intensity	IV	V	VI	VII	VIII	IX
Perceived shaking	light	moderate	strong	very strong	severe	violent
Observed damage	none	very light	light	moderate	moderate to heavy	heavy

83 Name the major fault along which both of these earthquakes occurred and identify the type of plate tectonic boundary that is located along this fault. [1]

84 Based on the Modified Mercalli Intensity Scale, identify the perceived shaking and the observed damage that occurred in the San Francisco area during the 1906 earthquake. [1]

85 Explain why Santa Rosa experienced a lower Modified Mercalli intensity shaking than Salinas experienced during the 1989 earthquake. [1]

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