

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING
EARTH SCIENCE

Thursday, January 24, 2002 — 1:15 to 4:15 p.m., only

This is a test of your knowledge of Earth science. Use that knowledge to answer all questions in this examination. Some questions may require the use of the *Earth Science Reference Tables*. The *Earth Science Reference Tables* are supplied separately. Be certain you have a copy of the *2001 edition* of these reference tables before you begin the examination.

Your answer sheet for Part A and Part B–1 is the last page of this examination booklet. Turn to the last page and fold it along the perforations. Then, slowly and carefully, tear off your answer sheet and fill in the heading.

Your answer booklet for Part B–2 and Part C is stapled in the center of this examination booklet. Open the examination booklet, carefully remove your answer booklet, and close the examination booklet. Then fill in the heading of your answer booklet.

You are to answer *all* questions in all parts of this examination according to the directions provided in the examination booklet. Record your answers to the Part A and Part B–1 multiple-choice questions on your separate answer sheet. Write your answers to the Part B–2 and Part C questions in your answer booklet. All work should be written in pen, except for graphs and drawings, which should be done in pencil. You may use scrap paper to work out the answers to the questions, but be sure to record all your answers on your answer sheet and answer booklet.

When you have completed the examination, you must sign the statement printed at the end of 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.

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, write on your separate answer sheet the *number* of the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *Earth Science Reference Tables*.

1 Summer days in New York State are likely to be hotter than winter days because in summer

- (1) Earth is closer to the Sun
- (2) the number of sunspots increases
- (3) Earth's northern axis is tilted toward the Sun
- (4) the Sun gives off more energy

2 Which planet takes more time to complete one rotation on its axis than to complete one revolution around the Sun?

- (1) Mercury
- (2) Venus
- (3) Mars
- (4) Jupiter

3 Which observation provides the best evidence that Earth rotates?

- (1) The position of the planets among the stars changes during the year.
- (2) The location of the constellations in relationship to *Polaris* changes from month to month.
- (3) The length of the shadow cast by a flagpole at noontime changes from season to season.
- (4) The direction of swing of a freely swinging pendulum changes during the day.

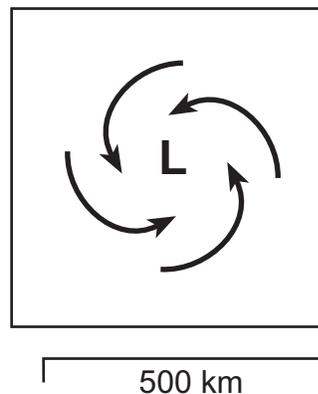
4 Which mineral is white or colorless, has a hardness of 2.5, and splits with cubic cleavage?

- (1) calcite
- (2) halite
- (3) pyrite
- (4) mica

5 Which radioactive isotope is most useful for determining the age of mastodont bones found in late Pleistocene sediments?

- (1) uranium-238
- (2) carbon-14
- (3) potassium-40
- (4) rubidium-87

6 A map view of surface air movement in a low-pressure system is shown below.



The air near the center of this low-pressure system usually will

- (1) evaporate into a liquid
- (2) reverse direction
- (3) rise and form clouds
- (4) squeeze together to form a high-pressure system

7 At which location will the highest altitude of the star *Polaris* be observed?

- (1) Equator
- (2) Tropic of Cancer
- (3) Arctic Circle
- (4) central New York State

8 Which star is cooler and many times brighter than Earth's Sun?

- (1) *Barnard's Star*
- (2) *Betelgeuse*
- (3) *Rigel*
- (4) *Sirius*

Base your answers to questions 9 and 10 on the field map below, which shows the average annual precipitation in New York State for the past 25 years. Isoline values represent inches per year.



9 Jamestown received more rainfall per year than Elmira. A reason for this difference is that Jamestown is located

- (1) closer to a large body of water
- (2) at a higher latitude
- (3) at a lower elevation
- (4) in the prevailing southerly wind belt

10 Which of these locations had the *lowest* average annual precipitation?

- (1) Kingston
- (2) New York City
- (3) Old Forge
- (4) Plattsburgh

11 Energy is transferred from the Sun to Earth mainly by

- (1) molecular collisions
- (2) density currents
- (3) electromagnetic waves
- (4) red shifts

13 Which factor has the greatest influence on the weathering rate of Earth's surface bedrock?

- (1) local air pressure
- (2) angle of insolation
- (3) age of the bedrock
- (4) regional climate

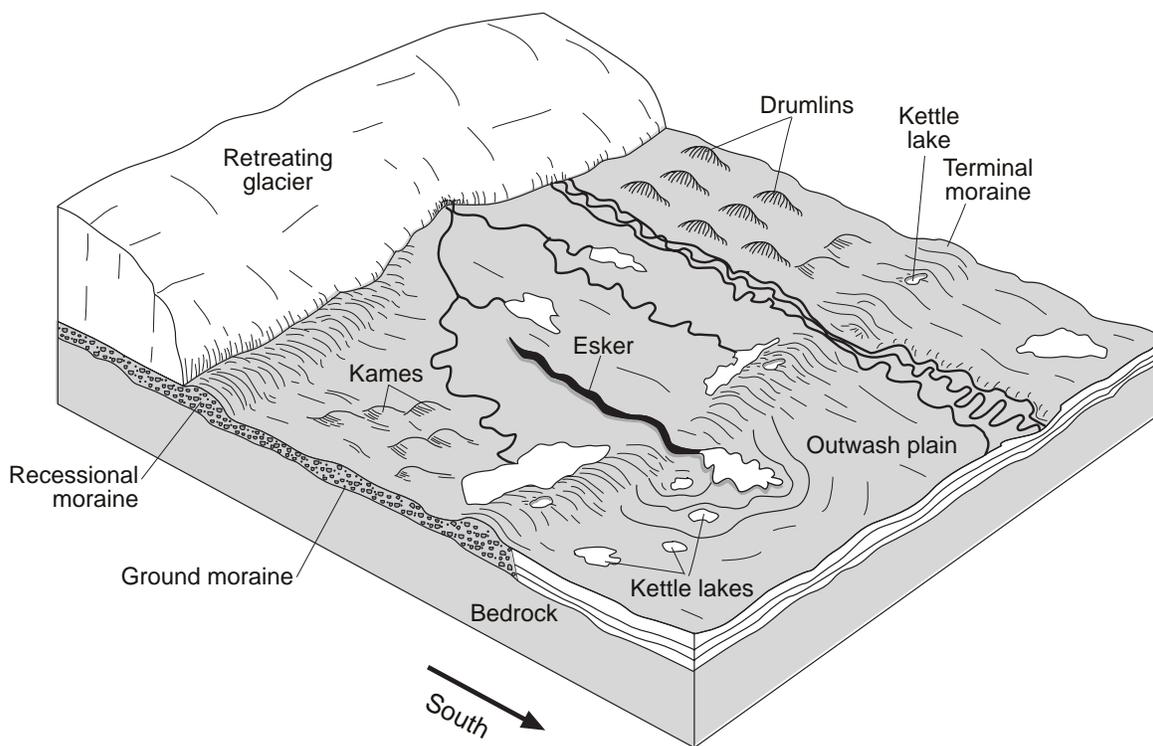
12 Which surface ocean current transports warm water to higher latitudes?

- (1) Labrador Current
- (2) Falkland Current
- (3) Gulf Stream
- (4) West Wind Drift

14 Compared to dull and rough rock surfaces, shiny and smooth rock surfaces are most likely to cause sunlight to be

- (1) reflected
- (2) refracted
- (3) scattered
- (4) absorbed

Base your answers to questions 15 through 17 on the block diagram below, which shows some of the landscape features formed as the most recent continental glacier melted and retreated across western New York State.



15 During which geologic epoch did this glacier retreat from New York State?

- (1) Pleistocene
- (2) Eocene
- (3) Late Pennsylvanian
- (4) Early Mississippian

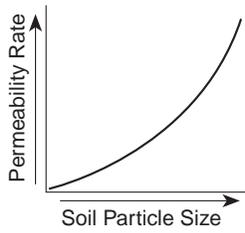
16 The moraines pictured in the block diagram were deposited directly by the glacier. The sediments within these moraines are most likely

- (1) sorted by size and layered
- (2) sorted by size and unlayered
- (3) unsorted by size and layered
- (4) unsorted by size and unlayered

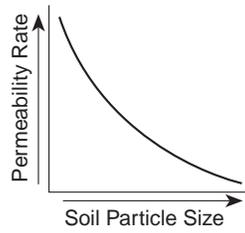
17 The shape of elongated hills labeled drumlins is most useful in determining the

- (1) age of the glacier
- (2) direction of glacial movement
- (3) thickness of the glacial ice
- (4) rate of glacial movement

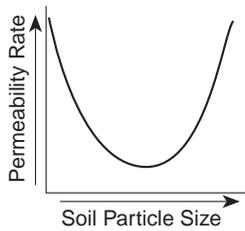
18 Which graph best represents the general relationship between soil particle size and the permeability rate of infiltrating rainwater?



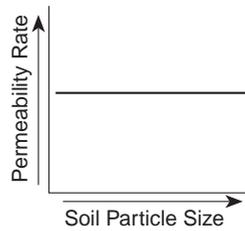
(1)



(3)

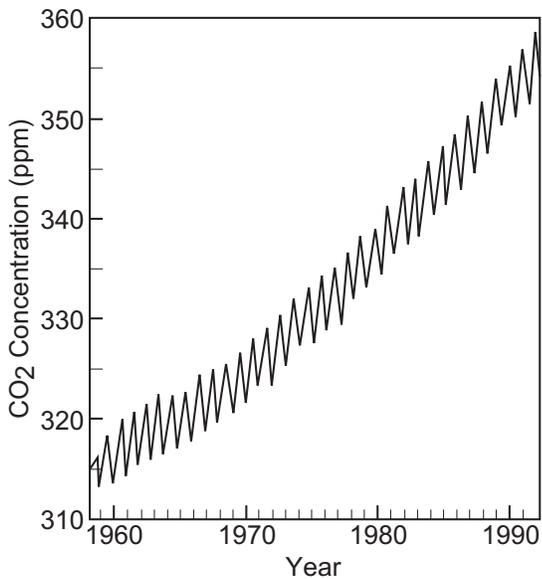


(2)



(4)

19 The graph below shows the change in carbon dioxide concentration in parts per million (ppm) in Earth's atmosphere from 1960 to 1990.



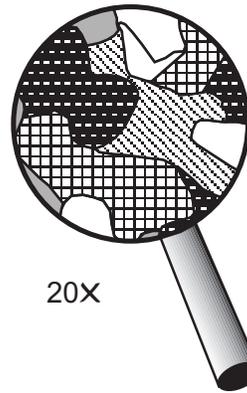
The most likely cause of the overall change in the level of carbon dioxide from 1960 to 1990 is an increase in the

- (1) number of violent storms
- (2) number of volcanic eruptions
- (3) use of nuclear power
- (4) use of fossil fuels

20 Liquid water can store more heat energy than an equal amount of any other naturally occurring substance because liquid water

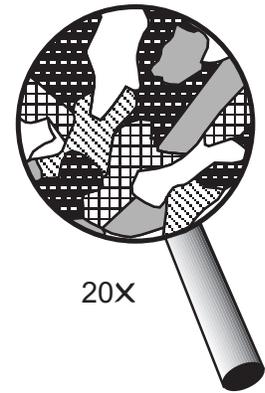
- (1) covers 71% of Earth's surface
- (2) has its greatest density at 4°C
- (3) has the higher specific heat
- (4) can be changed into a solid or a gas

21 The diagrams below show the crystals of four different rocks viewed through the same hand lens. Which crystals most likely formed from molten material that cooled and solidified most rapidly?



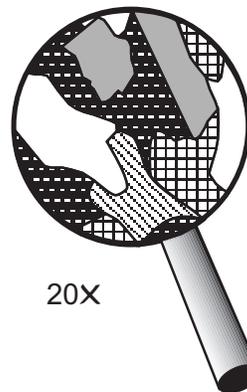
20X

(1)



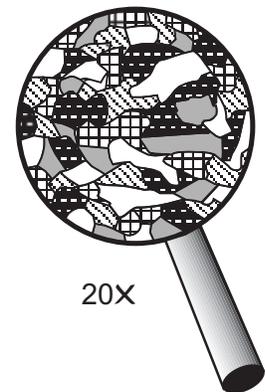
20X

(3)



20X

(2)

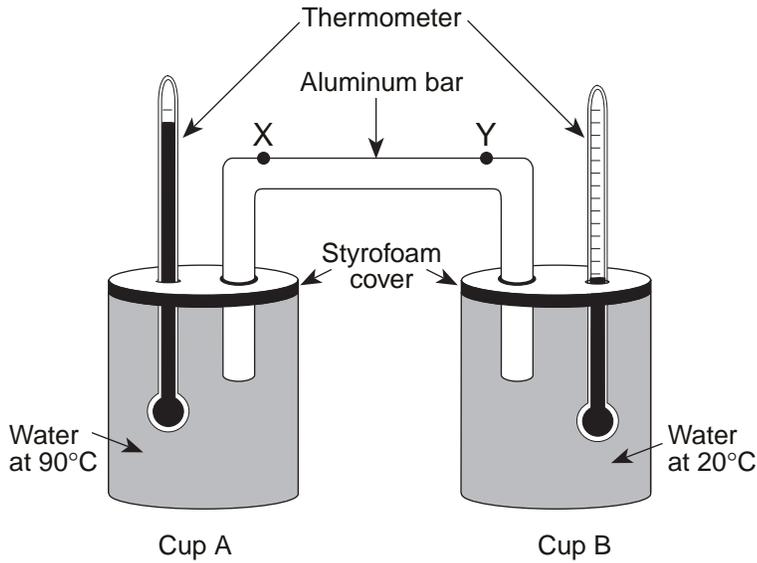


20X

(4)

Base your answers to questions 22 and 23 on the information about a laboratory procedure, diagram, and data table below.

Hot water at 90°C is poured into cup A. Cool water at 20°C is poured into cup B. Styrofoam covers are placed on the cups. An aluminum bar and a thermometer are placed through holes in each cover. Points X and Y are locations on the aluminum bar. The data table shows temperature readings taken every minute for 20 minutes.



| | Temperature of Water ($^{\circ}\text{C}$) | |
|--------|---|-------|
| Minute | Cup A | Cup B |
| 0 | 90 | 20 |
| 1 | 88 | 20 |
| 2 | 86 | 20 |
| 3 | 85 | 21 |
| 4 | 83 | 21 |
| 5 | 82 | 22 |
| 6 | 81 | 22 |
| 7 | 80 | 22 |
| 8 | 79 | 22 |
| 9 | 78 | 23 |
| 10 | 77 | 23 |
| 11 | 76 | 23 |
| 12 | 75 | 23 |
| 13 | 74 | 23 |
| 14 | 73 | 23 |
| 15 | 72 | 24 |
| 16 | 71 | 24 |
| 17 | 70 | 24 |
| 18 | 69 | 24 |
| 19 | 68 | 25 |
| 20 | 67 | 25 |

- 22 Which change in the experiment would increase the heating rate of the water in cup B?
- (1) making the aluminum bar shorter between points X and Y
 - (2) making the aluminum bar longer between points X and Y
 - (3) keeping cup A covered, but uncovering cup B
 - (4) keeping cup B covered, but uncovering cup A

- 23 The rate of temperature change for the water in cup A for the first 10 minutes was approximately
- (1) $0.77\text{ }^{\circ}\text{C}/\text{min}$
 - (2) $1.3\text{ }^{\circ}\text{C}/\text{min}$
 - (3) $7.7\text{ }^{\circ}\text{C}/\text{min}$
 - (4) $13.0\text{ }^{\circ}\text{C}/\text{min}$

- 24 Which sedimentary rock is most likely to be changed to slate during regional metamorphism?
- (1) breccia
 - (2) conglomerate
 - (3) dolostone
 - (4) shale

- 25 Which planet has an orbit with an eccentricity most similar to the eccentricity of the Moon's orbit around Earth?
- (1) Earth
 - (2) Jupiter
 - (3) Pluto
 - (4) Saturn

Base your answers to questions 26 through 28 on the weather map of North America below. The map shows the location of a front and the air mass influencing its movement.



26 Which region is the probable source of the air mass labeled cP on the map?

- (1) central Canada
- (2) southwestern United States
- (3) North Atlantic Ocean
- (4) Gulf of Mexico

27 Which type of front and frontal movement is shown on the weather map?

- (1) cold front moving northwestward
- (2) cold front moving southeastward
- (3) warm front moving northwestward
- (4) warm front moving southeastward

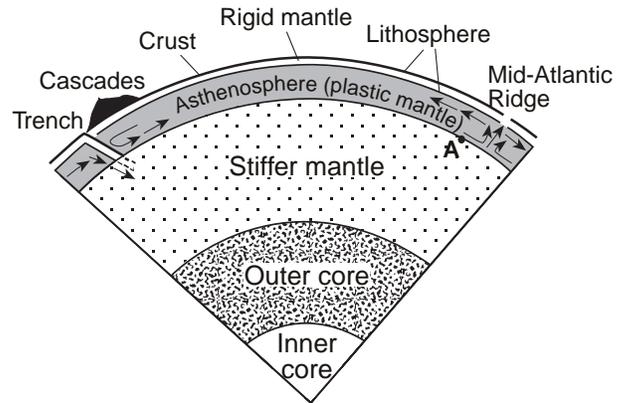
28 The cP air mass is identified on the basis of its temperature and

- (1) wind direction
- (2) cloud cover
- (3) moisture content
- (4) windspeed

29 Clouds usually form when

- (1) air temperature reaches the dewpoint
- (2) evaporation has warmed the surrounding air
- (3) relative humidity is 0%
- (4) condensation nuclei have been removed from the air

Base your answers to questions 30 and 31 on the diagram below, which shows a portion of Earth's interior. Point A is a location on the interface between layers.



(Not drawn to scale)

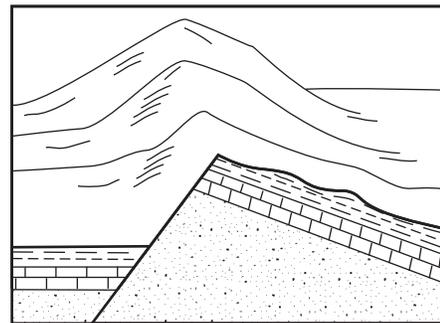
30 The arrows shown in the asthenosphere represent the inferred slow circulation of the plastic mantle by a process called

- (1) insolation
- (2) convection
- (3) conduction
- (4) radiation

31 The temperature of rock at location A is approximately

- (1) 600°C
- (2) 1,000°C
- (3) 2,600°C
- (4) 3,000°C

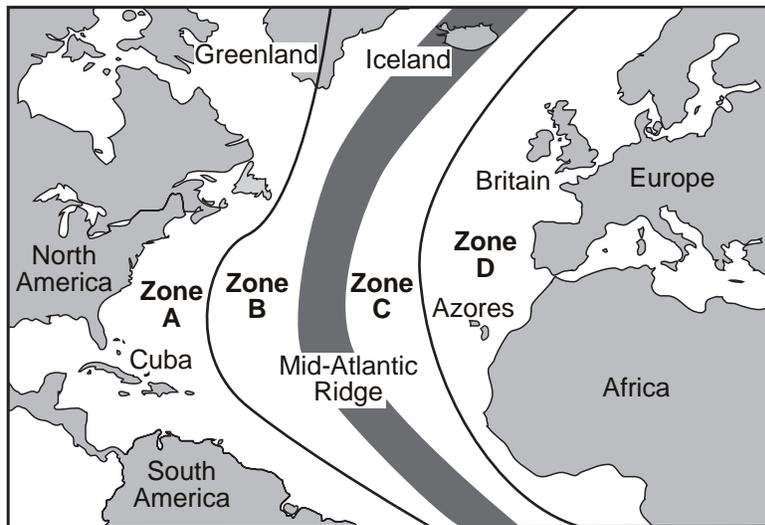
32 The diagram below shows the bedrock structure beneath a series of hills.



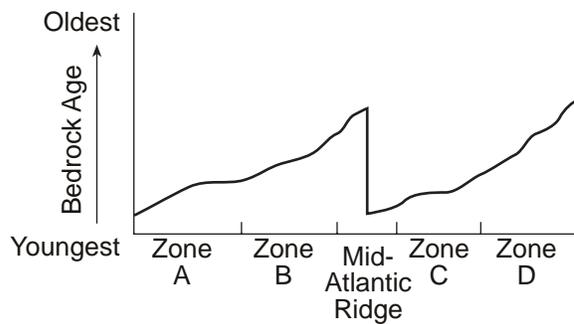
Which process was primarily responsible for forming the hills?

- (1) folding
- (2) faulting
- (3) deposition
- (4) vulcanism

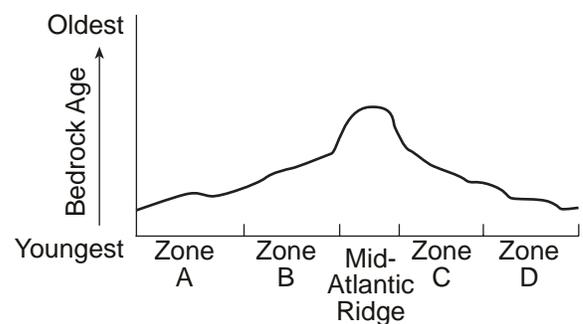
33 The map below shows the Atlantic Ocean divided into zones A, B, C, and D. The Mid-Atlantic Ridge is located between zones B and C.



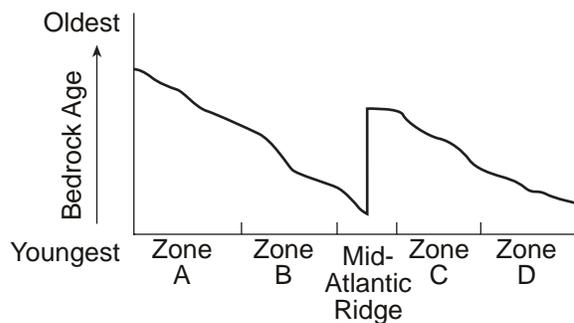
Which graph best represents the geologic age of the surface bedrock on the ocean bottom?



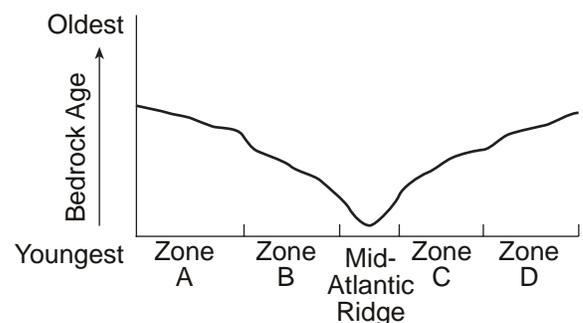
(1)



(3)



(2)



(4)

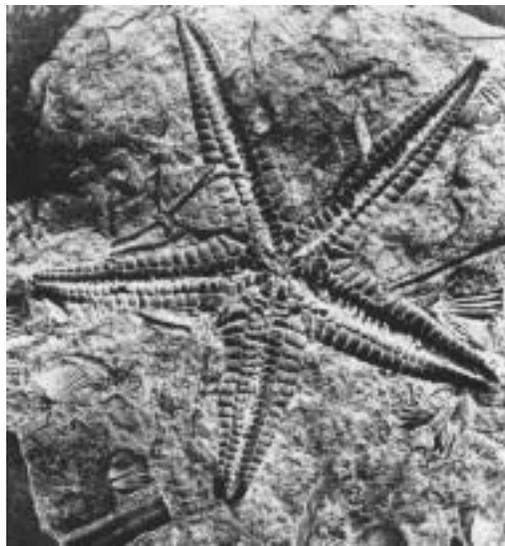
34 The table below describes the characteristics of three landscape regions, *A*, *B*, and *C*, found in the United States.

| Landscape | Bedrock | Elevation/Slopes | Streams |
|-----------|--------------------------------------|--|---|
| <i>A</i> | Faulted and folded gneiss and schist | High elevation Steep slopes | High velocity Rapids |
| <i>B</i> | Layers of sandstone and shale | Low elevation Gentle slopes | Low velocity Meanders |
| <i>C</i> | Thick horizontal layers of basalt | Medium elevation Steep to gentle slopes | High to low velocity Rapids and meanders |

Which list best identifies landscapes *A*, *B*, and *C*?

- (1) *A*—mountain, *B*—plain, *C*—plateau (3) *A*—plateau, *B*—mountain, *C*—plain
 (2) *A*—plain, *B*—plateau, *C*—mountain (4) *A*—plain, *B*—mountain, *C*—plateau

35 The Devonian-aged siltstone shown in the photograph below occurs as surface bedrock near Hamilton, New York.



0 _____ 2 cm

What does the presence of the fossils suggest about the Hamilton area during the Devonian?

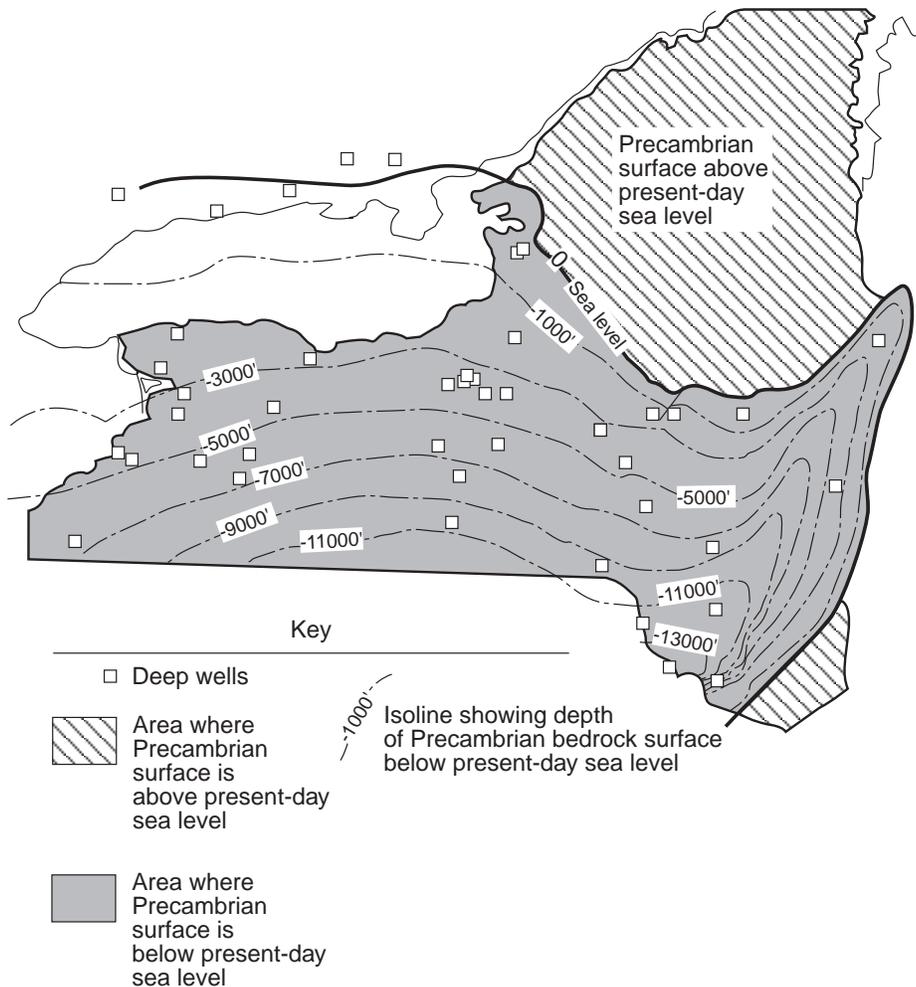
- (1) It had a terrestrial environment sometime between 443 and 418 million years ago.
 (2) It had a terrestrial environment sometime between 418 and 362 million years ago.
 (3) It had a marine environment sometime between 443 and 418 million years ago.
 (4) It had a marine environment sometime between 418 and 362 million years ago.

Part B-1

Answer all questions in this part.

Directions (36–50): For *each* statement or question, write on your separate answer sheet the *number* of the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *Earth Science Reference Tables*.

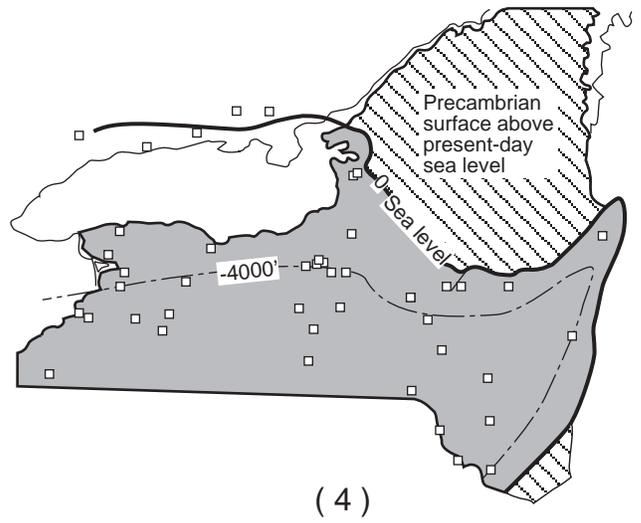
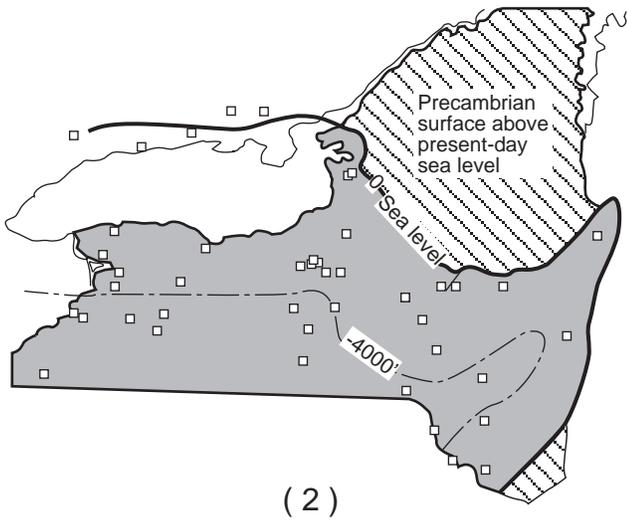
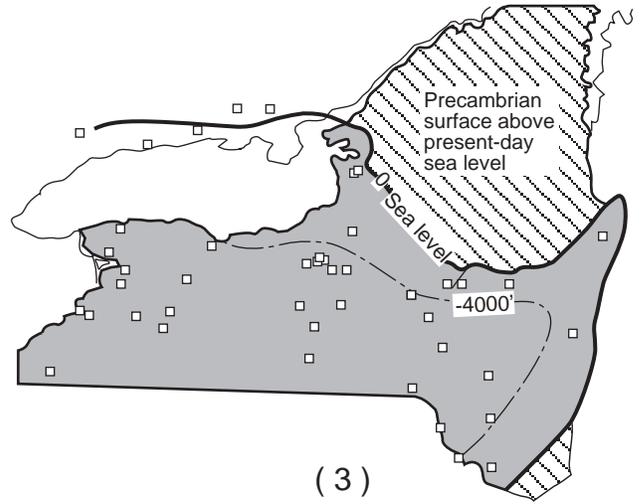
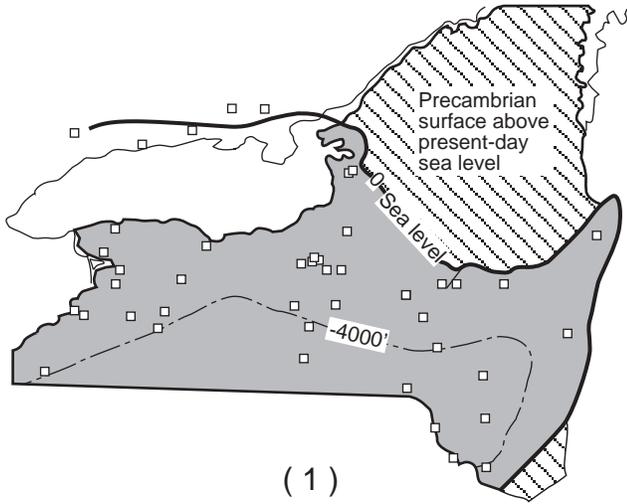
Base your answers to questions 36 through 38 on the map below, which shows most of New York State. Isolines indicate the depth of the Precambrian bedrock surface below present-day sea level. Depths are in feet.



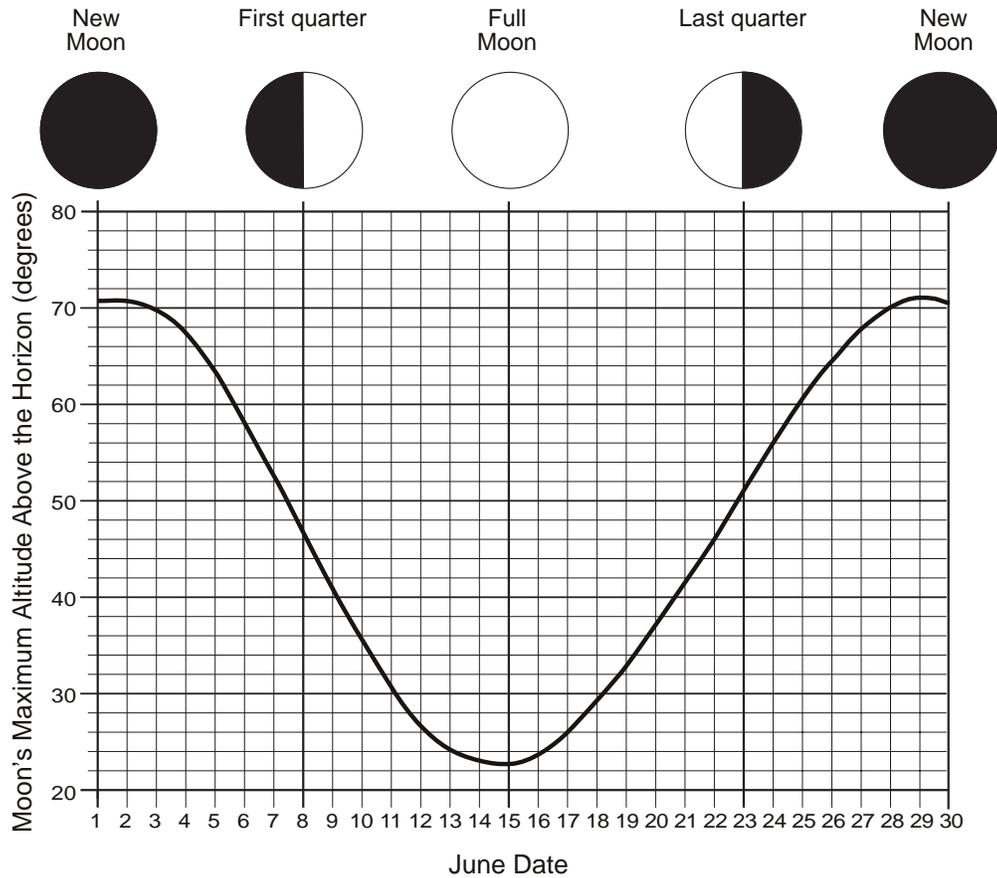
- 36 According to the map, in which two present-day New York State landscape regions is the most Precambrian bedrock likely to be exposed on the land surface?
- (1) Erie-Ontario Lowlands and Tug Hill Plateau
 - (2) Allegheny Plateau and Catskills
 - (3) Adirondack Mountains and Hudson Highlands
 - (4) Hudson-Mohawk Lowlands and Champlain Lowlands

- 37 What is the geologic age of most of the bedrock covering the Precambrian rock in present-day New York State?
- | | |
|---------------|--------------|
| (1) Paleozoic | (3) Mesozoic |
| (2) Cenozoic | (4) Archean |

38 Which map best shows the location of the -4,000-foot isoline?



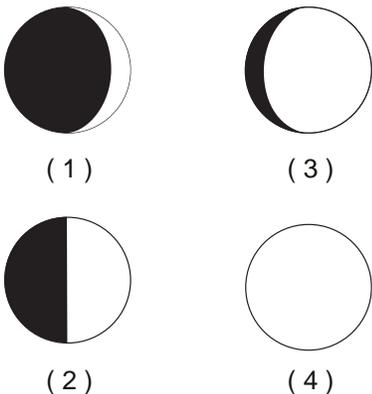
Base your answers to questions 39 through 42 on the graph below, which shows the maximum altitude of the Moon, measured by an observer located at a latitude of 43° N during June in a particular year. The names and appearance of the four major Moon phases are shown at the top of the graph, directly above the date on which the phase occurred.



39 What was the maximum altitude of the Moon on June 22?

- (1) 40° (3) 46°
 (2) 43° (4) 50°

40 Which diagram best represents the Moon's phase observed on June 11?



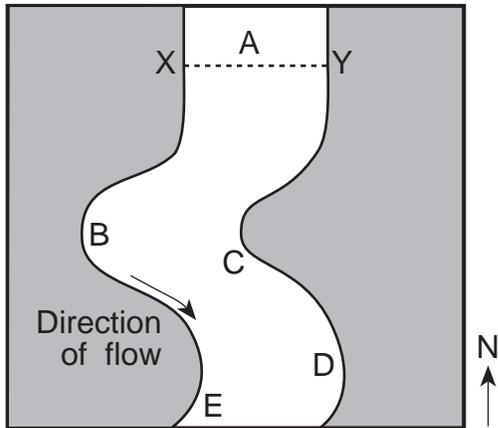
41 Which city is closest in latitude to the location where these observations were made?

- (1) Binghamton (3) Albany
 (2) New York City (4) Syracuse

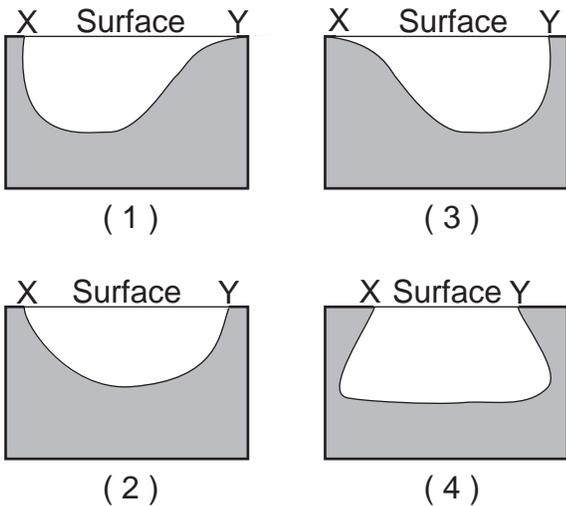
42 Which terms describe both the changes in the maximum altitude of the Moon and the changes in the Moon's phases over a period of several years?

- (1) cyclic and predictable
 (2) cyclic and unpredictable
 (3) noncyclic and predictable
 (4) noncyclic and unpredictable

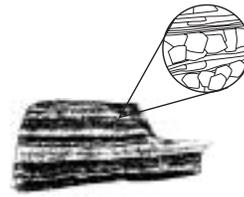
Base your answers to questions 43 through 45 on the map below, which shows a portion of a stream in New York State that flows southward. Letters A through E represent locations in the stream. Line XY is the location of a cross section.



- 43 At which two locations in this stream is deposition normally dominant over erosion?
- (1) A and D (3) C and E
 (2) B and E (4) D and C
- 44 Where this stream's velocity decreases from 300 to 200 centimeters per second, which size sediment will be deposited?
- (1) cobbles (3) silt
 (2) sand (4) clay
- 45 Which cross section along line XY best represents the shape of the stream bottom?

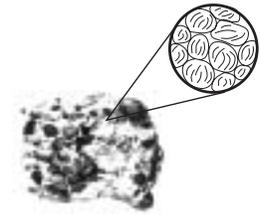


Base your answers to questions 46 and 47 on the pictures of four rocks shown below. Magnified views of the rocks are shown in the circles.



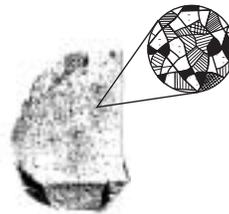
Rock 1

Bands of coarse intergrown crystals of various sizes



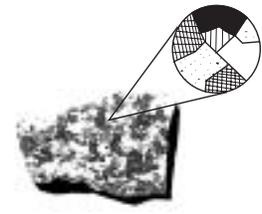
Rock 2

Particles of 0.01-cm to 1.0-cm size cemented together



Rock 3

Intergrown crystals less than 0.1 cm in size

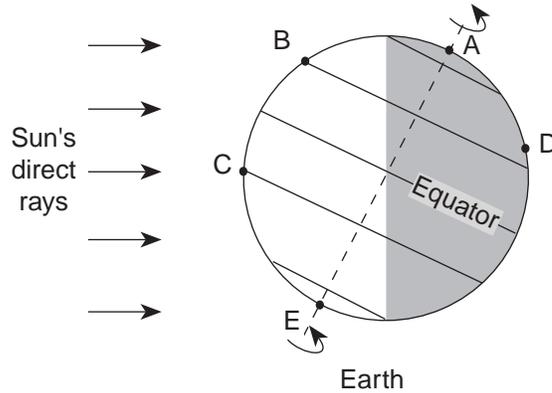


Rock 4

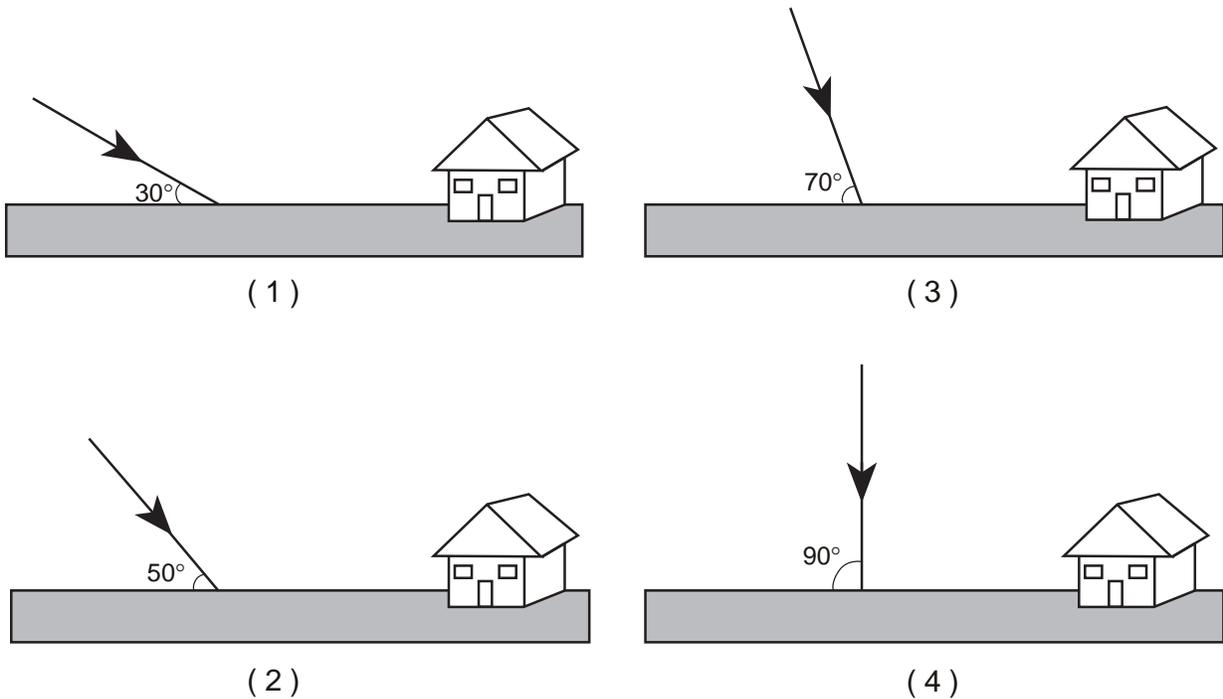
Intergrown crystals, mostly 2.0 cm in size

- 46 Which rock is metamorphic and shows evidence of foliation?
- (1) 1 (3) 3
 (2) 2 (4) 4
- 47 What do all four rock samples have in common?
- (1) They show cleavage.
 (2) They contain minerals.
 (3) They are organically formed.
 (4) They formed on Earth's surface.

Base your answers to questions 48 through 50 on the diagram below, which shows the tilt of Earth on its axis in relation to the Sun on one particular day. Points A through E are locations on Earth's surface. Point D is located in New York State. The dashed line represents Earth's axis.



48 Which diagram best represents the angle of the Sun's rays received at location C at noon on this day?



49 What is the latitude of location A?

- (1) 0°
- (2) $23\frac{1}{2}^\circ$ N
- (3) $63\frac{1}{2}^\circ$ S
- (4) 90° N

50 On this day, which location has the greatest number of hours of daylight?

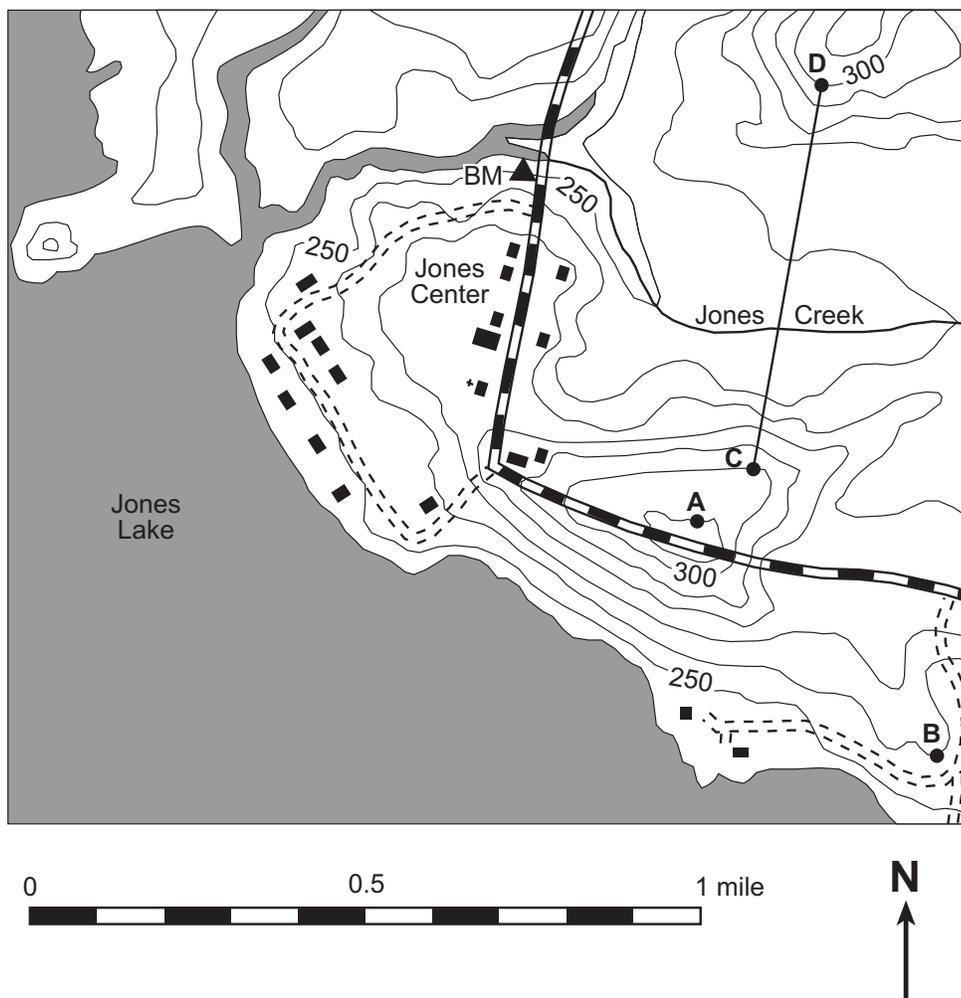
- (1) E
- (2) B
- (3) C
- (4) D

Part B-2

Answer all questions in this part.

Directions (51-58): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *Earth Science Reference Tables*.

Base your answers to questions 51 through 53 on the topographic map below. Points A through D are locations on the map. Elevations are in feet.



- 51 Explain briefly how the map can be used to determine that Jones Creek is flowing westward into Jones Lake. [1]
- 52 Determine the gradient from point A to point B by following the directions below.
- a Write the equation for determining the gradient.
 - b Substitute data from the map into the equation. [1]
 - c Calculate the gradient and label it with the proper units. [2]
- 53 On the grid provided in *your answer booklet*, construct a profile of the land surface between point C and point D by following the directions below.
- a Plot the elevations along line CD by marking with a dot *each* point where an isoline is crossed by line CD. [1]
 - b Connect the dots to complete the profile. [1]

Base your answers to questions 54 through 56 on the data table below. The table shows the elevation and average annual precipitation at ten weather stations, A through J, located along a highway that passes over a mountain.

Data Table

| Weather Station | Elevation (m) | Average Annual Precipitation (cm) |
|-----------------|---------------|-----------------------------------|
| A | 1,350 | 20 |
| B | 1,400 | 24 |
| C | 1,500 | 50 |
| D | 1,740 | 90 |
| E | 2,200 | 170 |
| F | 1,500 | 140 |
| G | 800 | 122 |
| H | 420 | 60 |
| I | 300 | 40 |
| J | 0 | 65 |

Symbol Chart

| Key for Average Annual Precipitation | |
|--------------------------------------|---|
| 0–25 cm |  |
| 26–75 cm |  |
| 76–127 cm |  |
| 128–170 cm |  |

- 54 On the grid provided in your answer booklet, graph the data shown on the data table by following the directions below.
- a* Mark the grid with a point showing the elevation of *each* weather station. [1]
- b* Surround *each* point with the proper symbol from the symbol chart to show the amount of average annual precipitation for the weather station. [1]
- 55 State the relationship between the elevation of weather stations A through E and the average annual precipitation at these weather stations. [1]
- 56 Although stations C and F are at the same elevation, they have very different amounts of average annual precipitation. Explain how the prevailing wind direction might cause this difference. [1]
-

57 Tectonic plate boundaries may be classified as divergent, convergent, or transform. For *each* location listed in the data table *in your answer booklet*, place an **X** in the proper column to indicate the type of plate boundary at that location. [2]

58 The following weather data was collected at Boonville, New York.

| | |
|-----------------------|-----------------|
| Air temperature | 65°F |
| Dewpoint | 64°F |
| Visibility | 2 miles |
| Present weather | drizzle |
| Wind direction | from the west |
| Wind speed | 5 knots |
| Amount of cloud cover | 100% |
| Barometric pressure | 996.2 millibars |

On the station model provided *in your answer booklet*, using the proper format, record:

- the amount of cloud cover [1]
 - the barometric pressure [1]
 - the symbol for the present weather [1]
-

Part C

Answer all questions in this part.

Directions (59–72): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *Earth Science Reference Tables*.

Base your answers to questions 59 through 61 on the paragraph below, which provides background information regarding recent fossil discoveries in Canada.

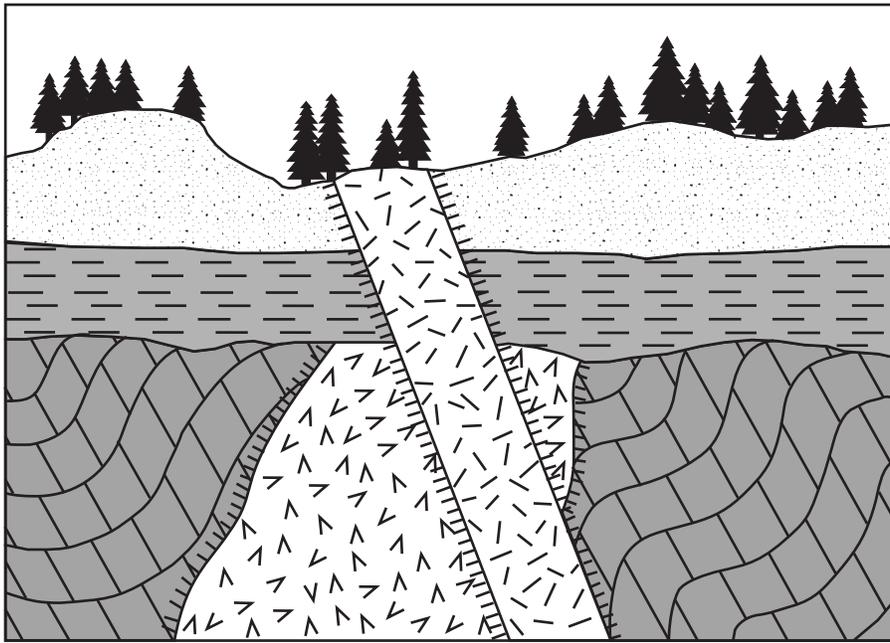
Scientific evidence indicates that the earliest mammals may have evolved approximately 225 million years ago from an ancient reptile group called the therapsids. For millions of years afterward, early mammals and therapsids coexisted until the therapsids apparently became extinct 165 million years ago. However, geologists have recently found a fossil they believe to be a therapsid that is only 60 million years old. They found the fossil, which they have named *Chronoperates paradoxus* (paradoxical time-wanderer), near Calgary in Canada. This find suggests that for 105 million years after the apparent extinction of the therapsids, a few of the reptiles continued to live in a narrow geographic range in Canada.

59 According to fossil evidence, during which geologic period did the earliest mammals appear on Earth? [1]

60 Explain briefly why *Chronoperates paradoxus* would *not* be a good index fossil. [1]

61 State one method geologists could have used to determine that *Chronoperates paradoxus* lived 60 million years ago. [1]

Base your answers to questions 62 and 63 on the information and diagram below. The diagram represents a cliff of exposed bedrock that was investigated by an Earth science class.



Key to Rock Symbols

| | | |
|---|--|---|
|  Sandstone |  Folded limestone |  Granite |
|  Basalt |  Shale |  Contact metamorphism |

After the students examined the cliff, they made three correct inferences about the geologic history of the bedrock.

- Inference 1: The shale layer is older than the basaltic intrusion.
- Inference 2: The shale layer is older than the sandstone layer.
- Inference 3: An unconformity exists directly under the shale layer.

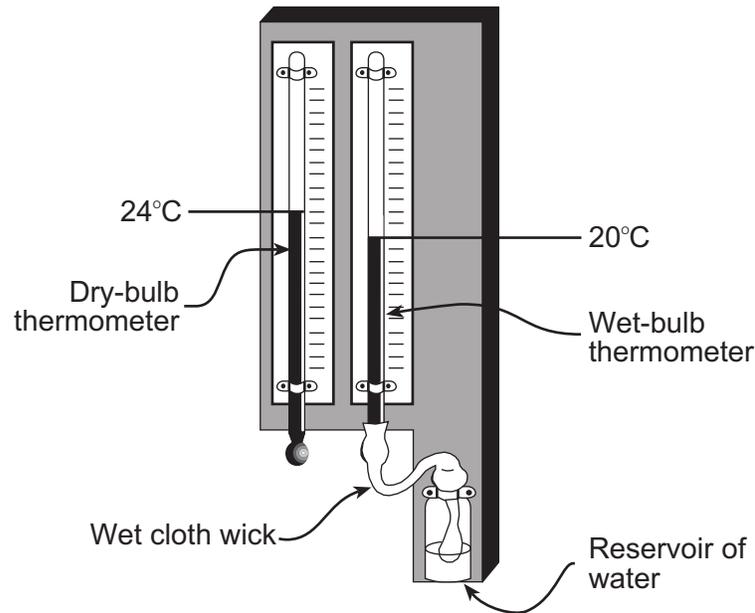
62 Explain how *each* inference is supported by evidence shown in the diagram. [3]

63 Students compared samples of the granite and basalt. State one observable characteristic other than crystal size that makes granite different from basalt. [1]

64 A seismic station in Massena, New York, recorded the arrival of the first *P*-wave at 1:30:00 (1 hour, 30 minutes, 00 seconds) and the first *S*-wave from the same earthquake at 1:34:30.

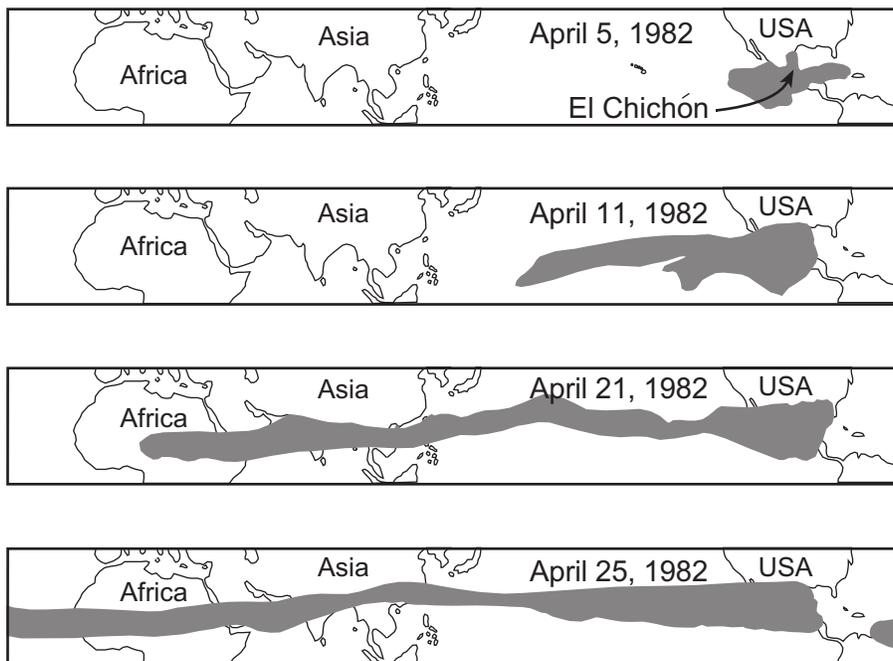
- a* Determine the distance, in kilometers, from Massena to the epicenter of this earthquake. [1]
- b* State what additional information is needed to determine the location of the epicenter of this earthquake. [1]

Base your answers to questions 65 through 67 on the diagram below, which shows a hygrometer located on a wall in a classroom. The hygrometer's temperature readings are used by the students to determine the relative humidity of the air in the classroom.



- 65 Based on the temperature readings shown in this diagram, determine the relative humidity of the air in the classroom. [1]
- 66 Besides relative humidity, identify another weather variable of the air in the classroom that may be determined by using both temperature readings on the hygrometer. [1]
- 67 Describe how water evaporating from the wick attached to the wet-bulb thermometer lowers the temperature reading of that thermometer. [1]
-
- 68 An Earth science class is preparing a booklet on emergency preparedness. State one safety measure that should be taken to minimize danger from *each* of the following threats. [3]
- a Thunderstorm
 - b Tornado
 - c Volcanic eruption

Base your answers to questions 69 through 72 on the maps below, which show the spread of a volcanic ash cloud from the 1982 eruption of El Chichón in Mexico, as seen from weather satellites.



69 Identify the direction toward which the ash cloud spread from April 5 to April 25. [1]

70 State what caused the main ash cloud to spread in the pattern shown on the map of April 25, 1982. [1]

71 State the most likely effect of the ash cloud on the temperature of areas under the cloud on April 25, 1982. [1]

72 As the ash cloud moved away from El Chichón, some ash particles fell back to Earth.

a Describe how the size of the particles affected the pattern of deposition. [1]

b Describe how the density of the particles affected the pattern of deposition. [1]

Tear Here

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING
EARTH SCIENCE

Thursday, January 24, 2002 — 1:15 to 4:15 p.m., only

ANSWER SHEET

Student Sex: Male Female Grade

Teacher School

Record your answers to Part A and Part B-1 on this answer sheet.

Part A

- 1 13 25
- 2 14 26
- 3 15 27
- 4 16 28
- 5 17 29
- 6 18 30
- 7 19 31
- 8 20 32
- 9 21 33
- 10 22 34
- 11 23 35
- 12 24

Part A Score

Part B-1

- 36 44
- 37 45
- 38 46
- 39 47
- 40 48
- 41 49
- 42 50
- 43

Part B-1 Score

Write your answers to Part B-2 and Part C in your answer booklet.

The declaration below should be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination and that I have neither given nor received assistance in answering any of the questions during the examination.

Signature

Tear Here

Tear Here

Tear Here

**PHYSICAL SETTING
EARTH SCIENCE**

Thursday, January 24, 2002 — 1:15 to 4:15 p.m., only

ANSWER BOOKLET

Male

Student Sex: Female

Teacher

School Grade

Answer all questions in Part B-2 and Part C. Record your answers in this booklet.

Performance Test Score
(Maximum Score: 23)

| Part | Maximum Score | Student's Score |
|------|---------------|-----------------|
| A | 35 | |
| B-1 | 15 | |
| B-2 | 15 | |
| C | 20 | |

Total Written Test Score
(Maximum Raw Score: 85)

Final Score
(from conversion chart)

Raters' Initials:

Rater 1 Rater 2

Part B-2

For Raters Only

51 _____

51

52

a

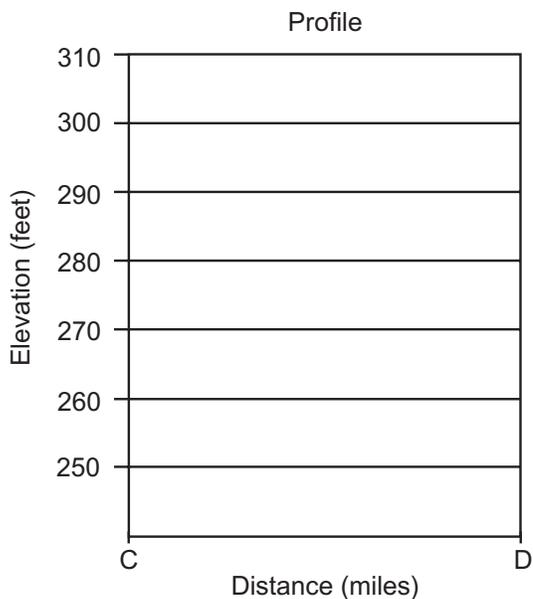
52 *b*

b

c

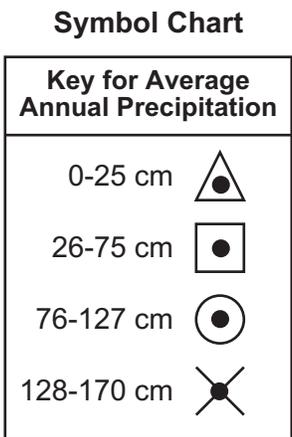
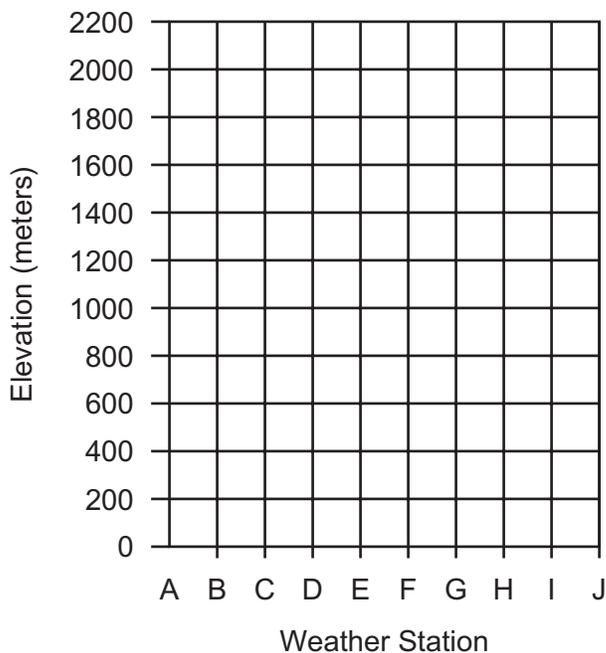
c

53 a-b



53 a
b

54 a-b



54 a
b

55

55

56

56

For Raters
Only

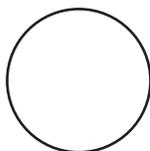
57

Plate Boundaries Data Table

| Location | Type of Plate Boundary | | |
|---------------------------------------|------------------------|------------|-----------|
| | Divergent | Convergent | Transform |
| East Pacific Ridge | | | |
| Aleutian Trench | | | |
| West side of the South American Plate | | | |
| San Andreas Fault | | | |

57

58 Station Model



58

Total Score for Part B-2

Part C

59 _____ Period

59

60 _____

60

61 _____

61

62 Inference 1: _____

62(1)

Inference 2: _____

(2)

Inference 3: _____

(3)

63 _____

63

**For Raters
Only**

64 *a* _____ km

64a

b _____

b

65 _____ %

65

66 _____

66

67 _____

67

68 *a* _____

68a

b _____

b

c _____

c

69 _____

69

70 _____

70

71 _____

71

72 *a* _____

72a

b _____

b

Total Score for Part C