

PHYSICAL SETTING EARTH SCIENCE

v202

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.

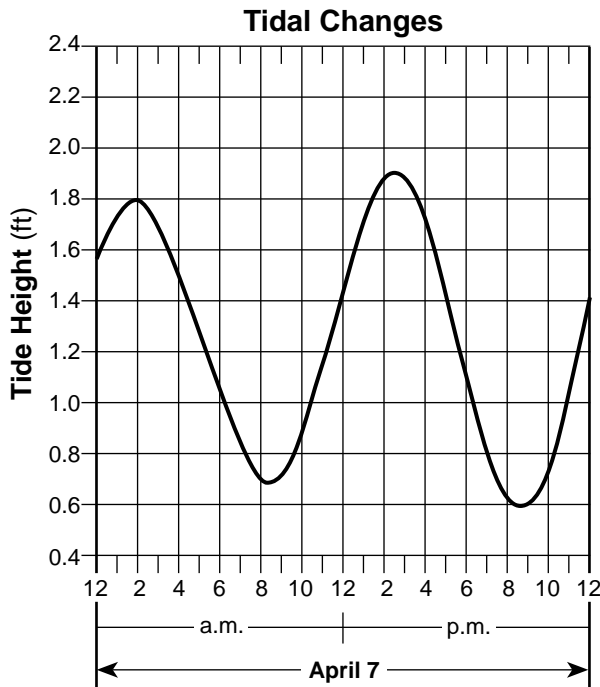
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

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 The graph below shows changing ocean tide heights in feet (ft) on April 7 for a coastal location.



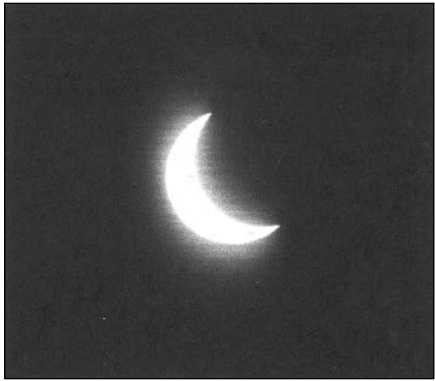
The next high tide will occur on April 8 at approximately

- (1) 10 a.m.
 - (2) 10 p.m.
 - (3) 3 a.m.
 - (4) 3 p.m.
- 2 Scientists who proposed the Big Bang Theory were attempting to explain
- (1) the origin of the universe
 - (2) why stars have different luminosities
 - (3) the formation of our solar system
 - (4) how Earth's atmosphere evolved
- 3 Which star type has a surface temperature of 4000 K and a luminosity 1000 times greater than the Sun?
- (1) dwarf
 - (2) main sequence
 - (3) giant
 - (4) supergiant

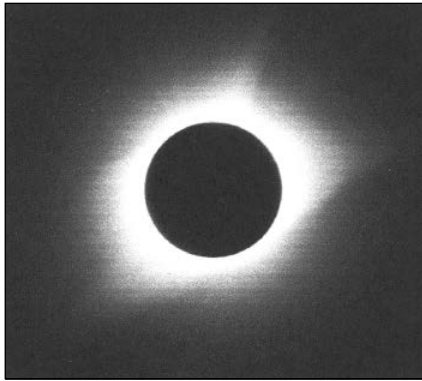
- 4 The red shift in light from stars located in very distant galaxies suggests that these stars are
- (1) decreasing in temperature
 - (2) increasing in temperature
 - (3) moving toward the Milky Way
 - (4) moving away from the Milky Way
- 5 A Foucault pendulum provides evidence that Earth
- (1) orbits the Sun
 - (2) has a nearly spherical shape
 - (3) is tilted on an axis
 - (4) spins on an axis
- 6 How many days during one year is the Sun directly overhead at noon in New York City?
- (1) one
 - (2) two
 - (3) three
 - (4) zero
- 7 Approximately which percentage of Earth's surface is exposed above water?
- (1) 30%
 - (2) 50%
 - (3) 70%
 - (4) 90%
- 8 On June 21, an observer in New York State will see the Sun set
- (1) north of due east
 - (2) north of due west
 - (3) south of due east
 - (4) south of due west
- 9 Compared to a well-sorted sample of larger-sized particles, a well-sorted sample of smaller-sized particles has greater
- (1) capillarity
 - (2) transpiration
 - (3) permeability
 - (4) porosity

10 The photographs below show two celestial objects just before, during, and just after a total solar eclipse as viewed by an observer located in Kingston, Tennessee, on August 21, 2017.

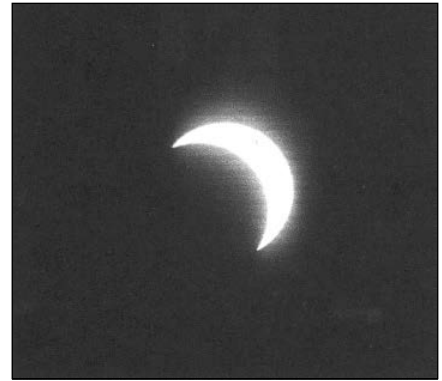
Photograph 1:
Just Before Eclipse



Photograph 2:
Total Solar Eclipse

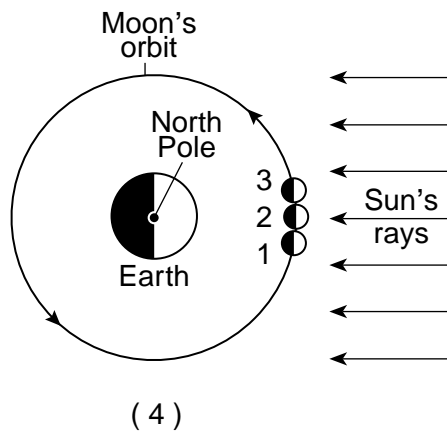
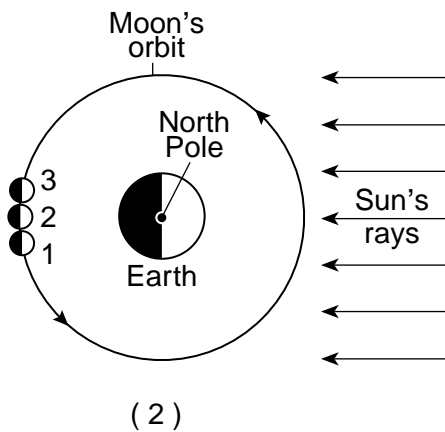
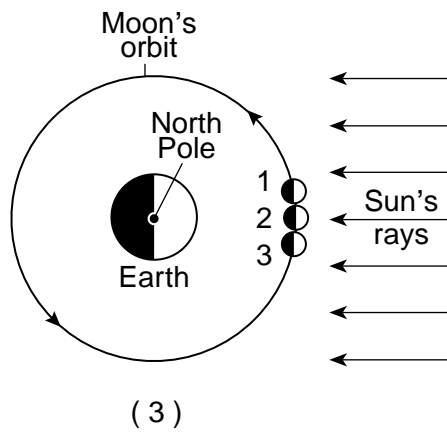
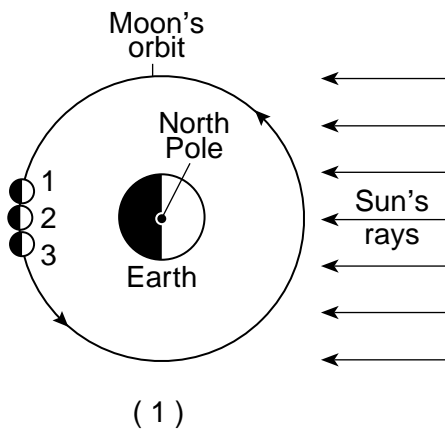


Photograph 3:
Just After Eclipse

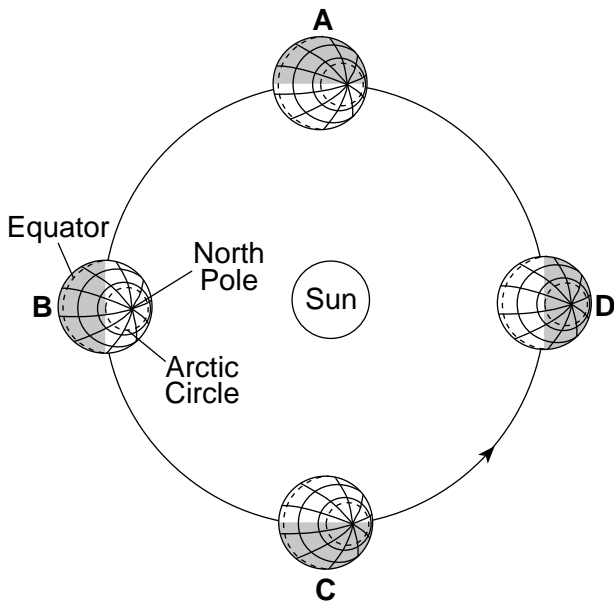


G. Meyer

Which diagram represents the location of the Moon in its orbit at the time that each of these three photographs (1, 2, and 3) were taken? (Diagrams are not drawn to scale.)



11 The diagram below represents Earth in four positions, labeled A, B, C, and D, in its orbit around the Sun on the first day of each season.



(Not drawn to scale)

Between which two consecutive positions is the summer season occurring in the Northern Hemisphere?

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

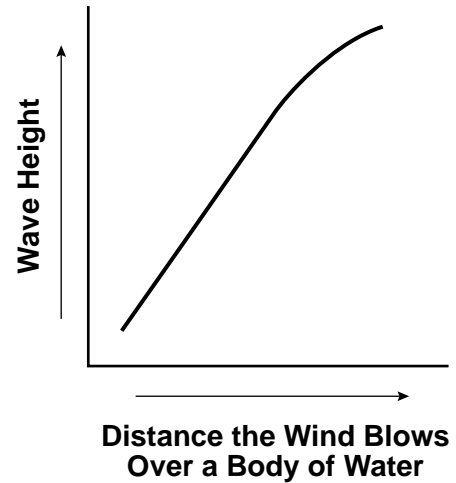
12 Which atmospheric conditions occur when the dry-bulb temperature is 30°C and the difference between the dry-bulb temperature and wet-bulb temperature is 1°C ?

- (1) warm and humid
- (2) warm and dry
- (3) cool and humid
- (4) cool and dry

13 Which precaution is most appropriate during a blizzard?

- (1) Take shelter in a basement.
- (2) Avoid unnecessary travel.
- (3) Evacuate to higher ground.
- (4) Stay away from tall metal objects.

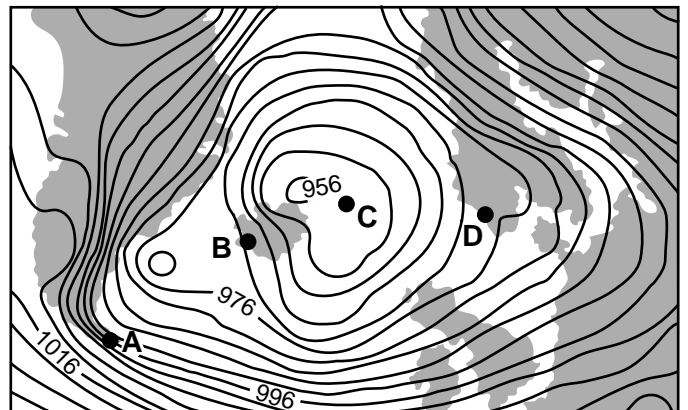
14 The graph below shows the relationship between the distance that wind blows over a body of water and the height of the waves that are generated.



A west wind blowing with the same velocity would generate the highest waves along the shoreline at

- (1) Jamestown
- (2) Oswego
- (3) Plattsburgh
- (4) Riverhead

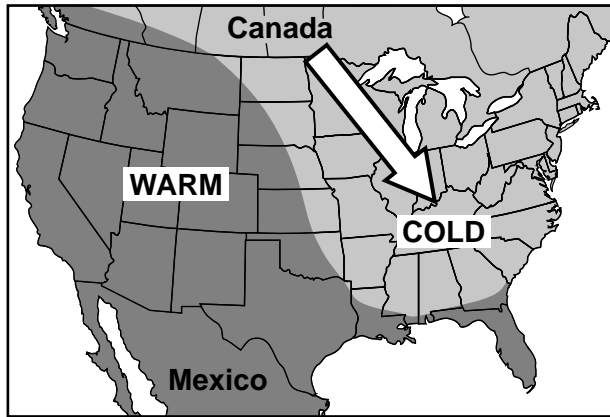
15 The weather map below shows a storm centered north of Iceland. Points A, B, C, and D indicate locations on Earth's surface. Isobars are labeled in millibars.



Which location was probably experiencing the highest wind speed?

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

- 16 The map below shows a cold, arctic air mass that moved southeast from Canada to cover most of the eastern half of the United States during January 2010.

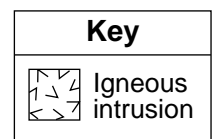
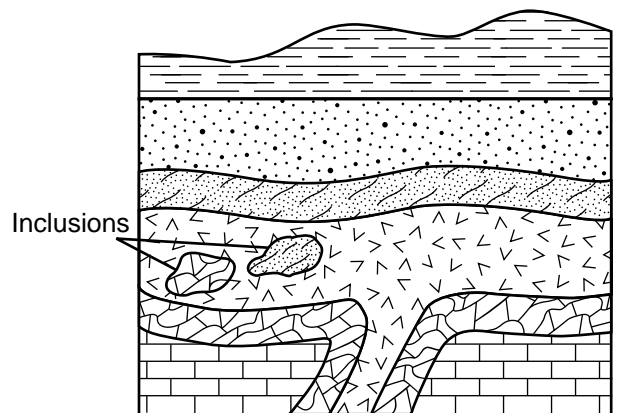


Which shift caused this flow of cold air out of Canada?

- (1) the northward shift of the global temperature zones
 - (2) the northward shift of the Sun's vertical rays
 - (3) a southward shift of the polar front jet stream
 - (4) a southward shift of the subtropical jet stream
- 17 Which surface ocean current cools the climate of the western coastline of South America?
- (1) Brazil Current
 - (2) Peru Current
 - (3) Falkland Current
 - (4) California Current
- 18 When equal masses of ice and liquid water receive the same amount of energy, without a change in state, the ice changes temperature faster than the liquid water does because the
- (1) specific heat of ice is less than the specific heat of liquid water
 - (2) specific heat of ice is greater than the specific heat of liquid water
 - (3) density of ice is less than the density of liquid water
 - (4) density of ice is greater than the density of liquid water

- 19 El Niño is a condition associated with a buildup of unusually warm water along the western coast of South America. Which changes in air temperature and precipitation usually occur in that region during El Niño?

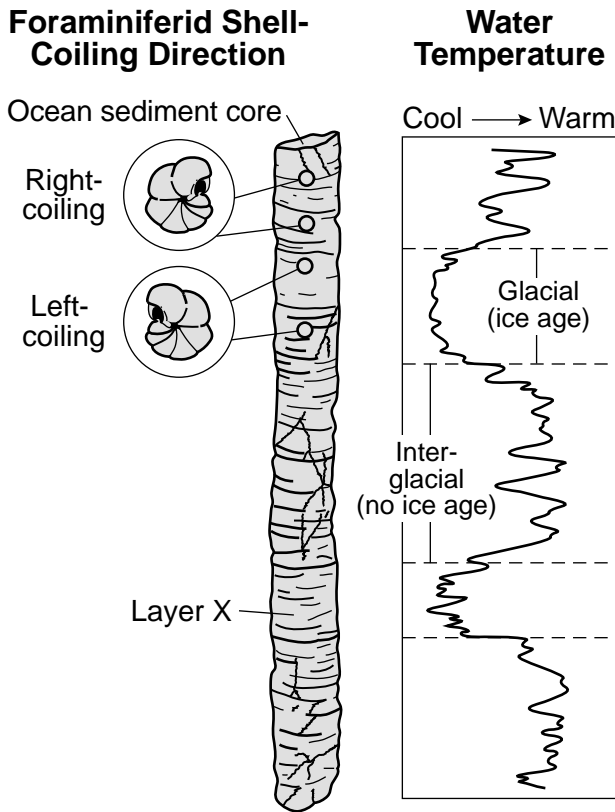
- (1) lower air temperature and less precipitation
 - (2) lower air temperature and more precipitation
 - (3) higher air temperature and less precipitation
 - (4) higher air temperature and more precipitation
- 20 Which conclusion can be drawn from the pattern of fossils found in Earth's rock record?
- (1) Humans have existed for a longer period of time than dinosaurs.
 - (2) Complex land organisms have been replaced by simpler marine forms.
 - (3) Many species have existed in the past, and most have become extinct.
 - (4) Few life forms existed before the late Cretaceous period.
- 21 The geologic cross section below represents a portion of Earth's crust. The rock layers have *not* been overturned.



The inclusions were most likely broken off from their original rock layers

- (1) at the same time as the intrusion of magma
- (2) at the same time as the crystallization of magma
- (3) before the formation of sandstone
- (4) before the formation of limestone

22 While studying sediments deposited during and after the last ice age, scientists discovered that foraminiferid shells coil in different directions when they grow under different temperature conditions, as shown in the diagram below.



Foraminiferid shells found in layer X most likely coiled to the

- (1) right, because water temperatures were cool
- (2) right, because water temperatures were warm
- (3) left, because water temperatures were cool
- (4) left, because water temperatures were warm

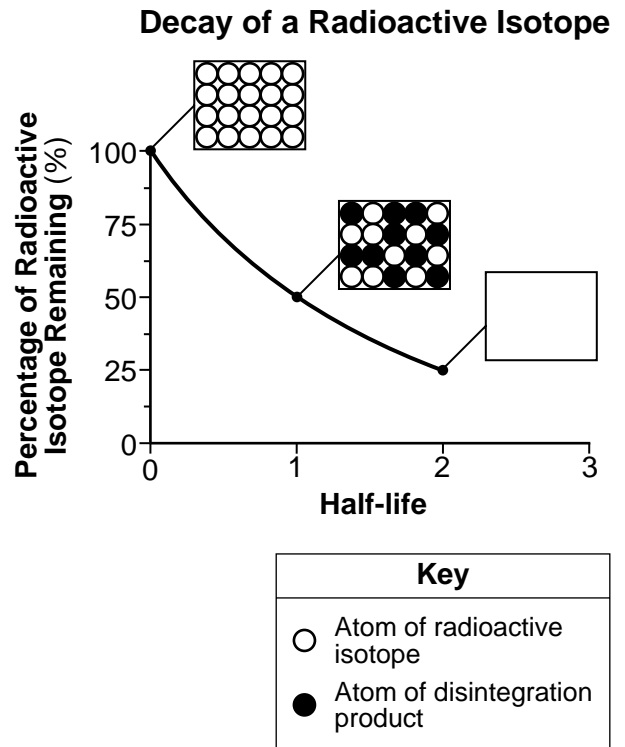
23 Approximately how many million years ago (mya) was the amount of Earth's total landmass located south of the equator the greatest?

- (1) 119 mya
- (2) 232 mya
- (3) 359 mya
- (4) 458 mya

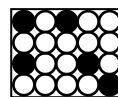
24 Which layer of Earth's interior is inferred to be composed of solid iron and nickel?

- (1) asthenosphere
- (2) stiffer mantle
- (3) outer core
- (4) inner core

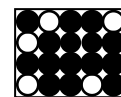
25 The graph below shows the rate of decay of a radioactive isotope through two half-lives. Each box shows the ratio of atoms of the radioactive isotope to atoms of the disintegration product. The box at two half-lives has been left blank.



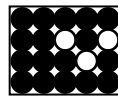
Which box best represents the ratio of these atoms at two half-lives?



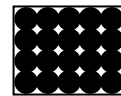
(1)



(3)



(2)

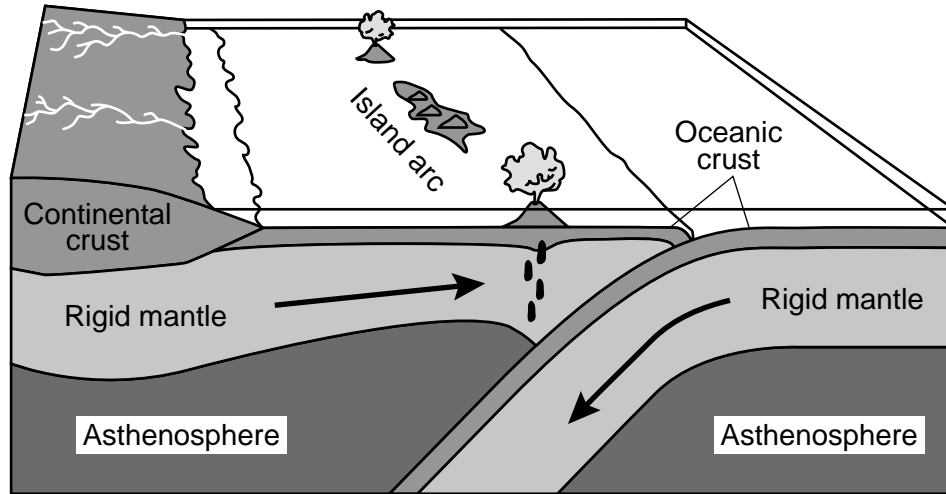


(4)

26 The first S-wave reaches a seismic station 22 minutes after an earthquake occurred. How long did it take the first P-wave to reach the same seismic station?

- (1) 8 minutes 50 seconds
- (2) 10 minutes 00 seconds
- (3) 12 minutes 00 seconds
- (4) 12 minutes 50 seconds

27 The block diagram below represents the formation of an island arc near a plate boundary.



An island arc is located near the boundary between which two tectonic plates?

- (1) Antarctic Plate and Indian–Australian Plate
- (2) Philippine Plate and Eurasian Plate
- (3) African Plate and North American Plate
- (4) Scotia Plate and South American Plate

28 Which table correctly matches the average density and composition of continental and oceanic crusts?

Type of Crust	Continental	Oceanic
Average Density	3.0 g/cm ³	2.7 g/cm ³
Composition	Felsic	Mafic

(1)

Type of Crust	Continental	Oceanic
Average Density	3.0 g/cm ³	2.7 g/cm ³
Composition	Mafic	Felsic

(2)

Type of Crust	Continental	Oceanic
Average Density	2.7 g/cm ³	3.0 g/cm ³
Composition	Mafic	Felsic

(3)

Type of Crust	Continental	Oceanic
Average Density	2.7 g/cm ³	3.0 g/cm ³
Composition	Felsic	Mafic

(4)

29 The photograph below shows a portion of the San Andreas Fault in the western United States.



<http://education.nationalgeographic.com>

The San Andreas Fault is an example of a

- (1) transform plate boundary
- (2) divergent plate boundary
- (3) convergent plate boundary
- (4) complex plate boundary

30 What is the minimum stream velocity necessary to transport a quartz particle that is 0.1 centimeter in diameter in a stream?

- (1) 0.05 cm/s
- (2) 0.5 cm/s
- (3) 5.0 cm/s
- (4) 50.0 cm/s

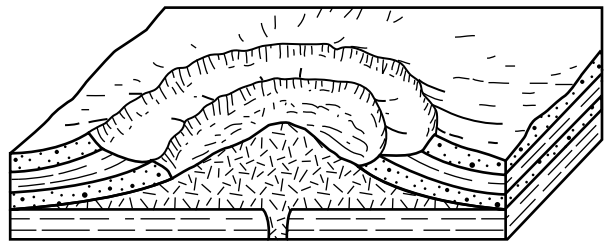
31 Scoria is a type of rock that forms most directly from the process of

- (1) solidification
- (2) cementation
- (3) erosion
- (4) metamorphism

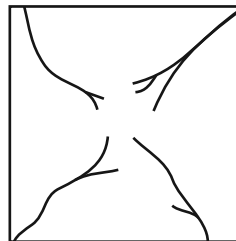
32 The element silicon (Si) is used in the production of cell phones. Which mineral could be a possible source of this silicon?

- (1) calcite
- (2) galena
- (3) halite
- (4) quartz

33 The block diagram below shows a portion of a deeply eroded dome landscape.



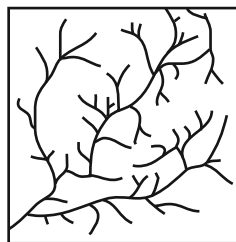
Which map shows the stream pattern that probably formed on the surface of this landscape?



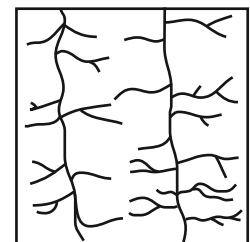
(1)



(3)



(2)

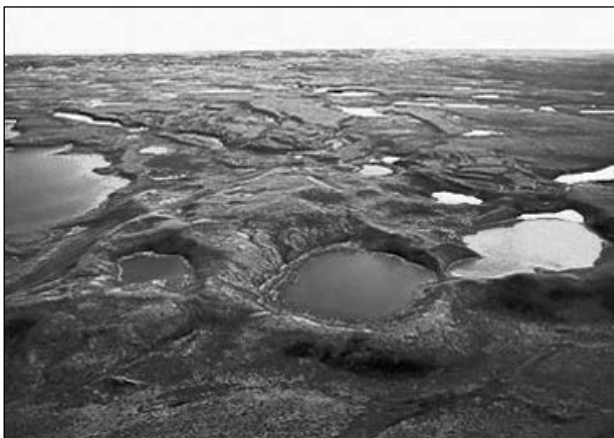


(4)

34 Which two New York State locations have surface bedrock of similar ages?

- (1) Mt. Marcy and Slide Mt.
- (2) Buffalo and Rochester
- (3) Old Forge and Niagara Falls
- (4) Watertown and Albany

35 The aerial photograph below shows small, circular bodies of water surrounded by sediment in an area that was once covered by glaciers.



www.arctic.uoguelph.ca

These bodies of water are known as

- (1) finger lakes
- (2) kettle lakes

- (3) tributaries
 - (4) watersheds
-

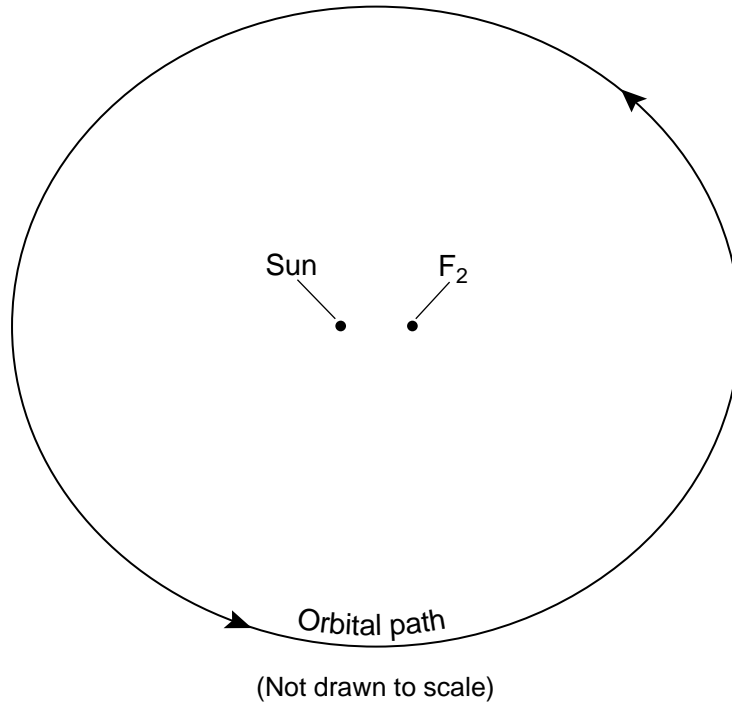
GO ON TO THE NEXT PAGE ⇨

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 diagram below and on your knowledge of Earth science. The diagram represents the elliptical orbit for one planet in our solar system. The two foci of the orbit are shown as the Sun and F_2 .



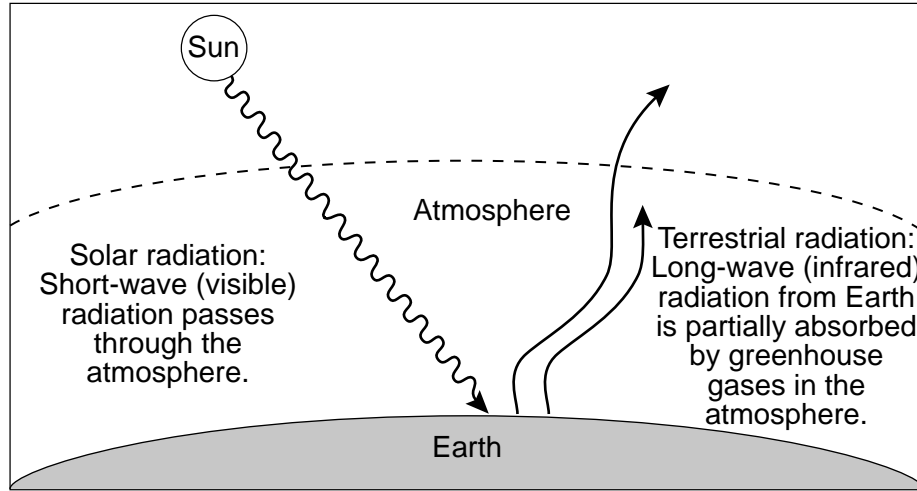
36 Which condition would produce an orbit with a greater eccentricity?

- (1) a decrease in the distance between the Sun and F_2
- (2) an increase in the distance between the Sun and F_2
- (3) a constant decrease in the orbital velocity of the planet
- (4) a constant increase in the orbital velocity of the planet

37 The arrangement and movement of celestial objects in our solar system is best described by the

- (1) spiral model
 - (2) cosmic model
 - (3) geocentric model
 - (4) heliocentric model
-

Base your answers to questions 38 and 39 on the diagram below and on your knowledge of Earth science. The diagram represents a simplified model of the incoming (solar) and outgoing (terrestrial) electromagnetic radiation of Earth's energy budget.



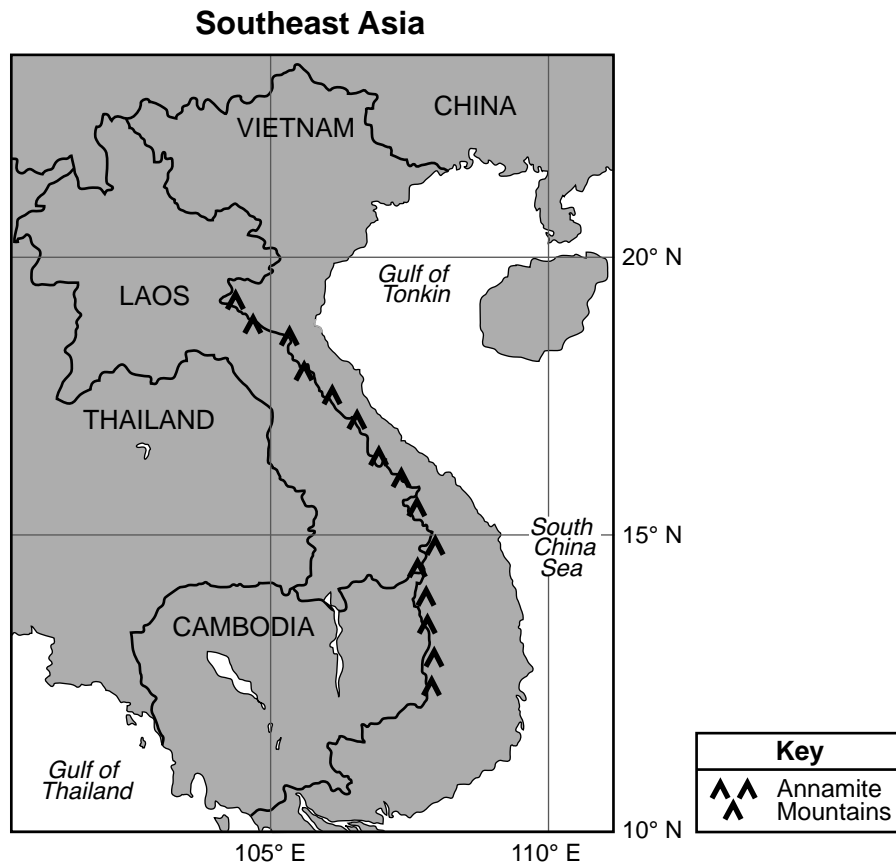
(Not drawn to scale)

- 38 Which color and texture of Earth materials absorbs the greatest amount of short-wave radiation from the Sun?
- (1) light color and smooth texture
 - (2) light color and rough texture
 - (3) dark color and smooth texture
 - (4) dark color and rough texture
- 39 Two major greenhouse gases that absorb outgoing long-wave radiation within the atmosphere are
- (1) methane and oxygen
 - (2) methane and carbon dioxide
 - (3) nitrogen and oxygen
 - (4) nitrogen and carbon dioxide
-

Base your answers to questions 40 and 41 on the passage and map below and on your knowledge of Earth science. The map shows a portion of Southeast Asia.

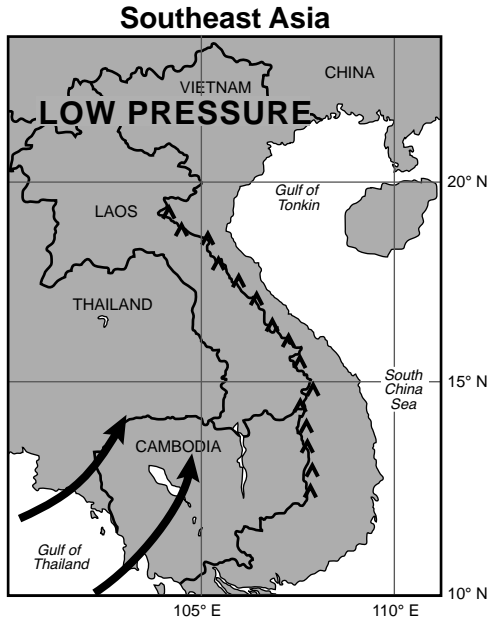
Southeast Asia Monsoons

The Southeast Asia monsoons are seasonal shifts in the direction of regional planetary winds. These shifts are related to the movement of air pressure belts as the Sun's vertical ray changes latitude. In the late spring, winds begin to blow from the southwest, bringing moisture from the Gulf of Thailand across Southeast Asia. Rainfall reaches a peak in July and August. This moisture is partially blocked by the Annamite Mountains, located along the border between Vietnam and Laos. Therefore, the rainfall in central Vietnam is somewhat less during these months. In September, the winds reverse direction and begin to flow from the northeast across the Gulf of Tonkin and South China Sea. This wind shift begins the season of heavy rainfall in central Vietnam that continues for months.

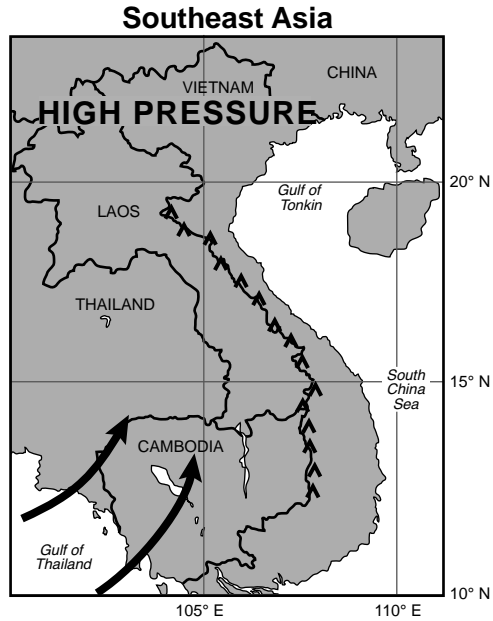


- 40 Heavy rains occur in Cambodia and Thailand when the moist air brought by the monsoon
- (1) rises, expands, and cools
 - (2) rises, contracts, and warms
 - (3) sinks, expands, and cools
 - (4) sinks, contracts, and warms

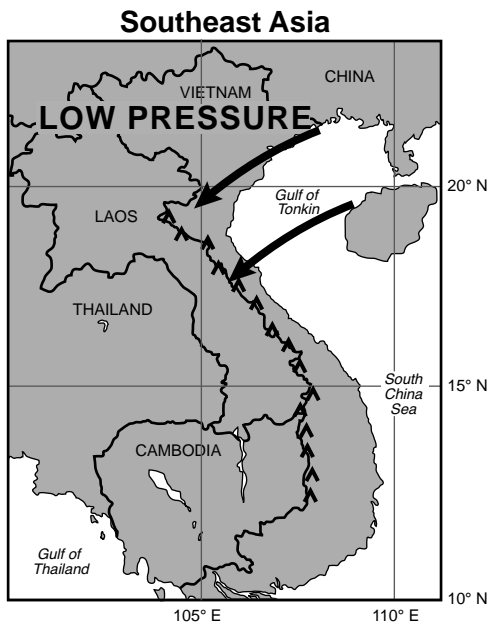
41 Which map shows the most likely location and direction of the monsoon winds and regional atmospheric pressure occurring in Southeast Asia in July?



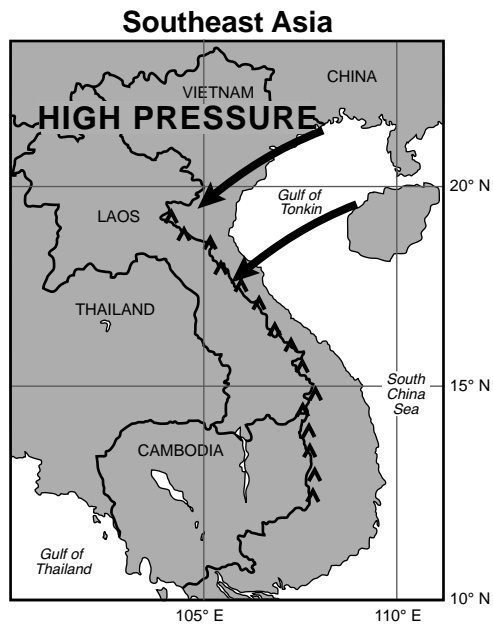
(1)



(3)

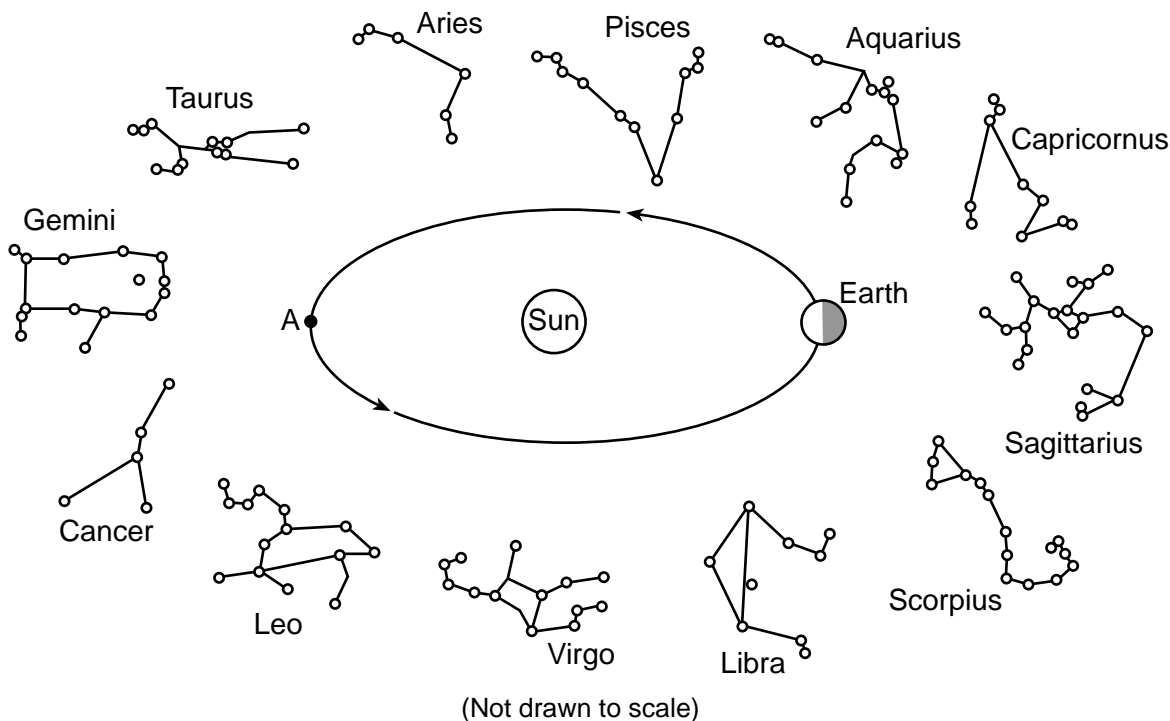


(2)



(4)

Base your answers to questions 42 and 43 on the diagram below and on your knowledge of Earth science. The diagram represents one position of Earth in its orbit around the Sun and 12 constellations that can be seen in the night sky by an observer in New York State at different times of the year. The approximate locations of the constellations in relation to Earth's orbit are shown. Point A represents another position in Earth's orbit.



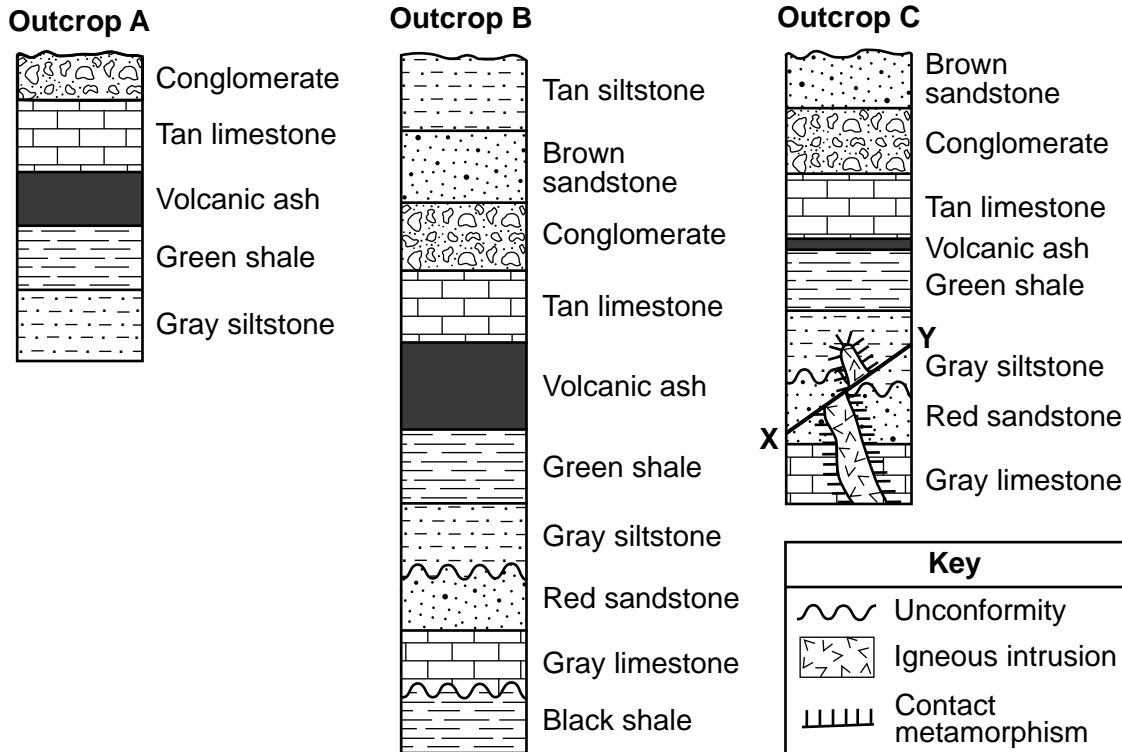
42 When Earth is located in the orbital position shown on the diagram, which constellation is visible to an observer in New York State at midnight?

- | | |
|------------|--------------|
| (1) Gemini | (3) Scorpius |
| (2) Pisces | (4) Virgo |

43 Approximately how many days (d) does it take for Earth to orbit from its present position to point A?

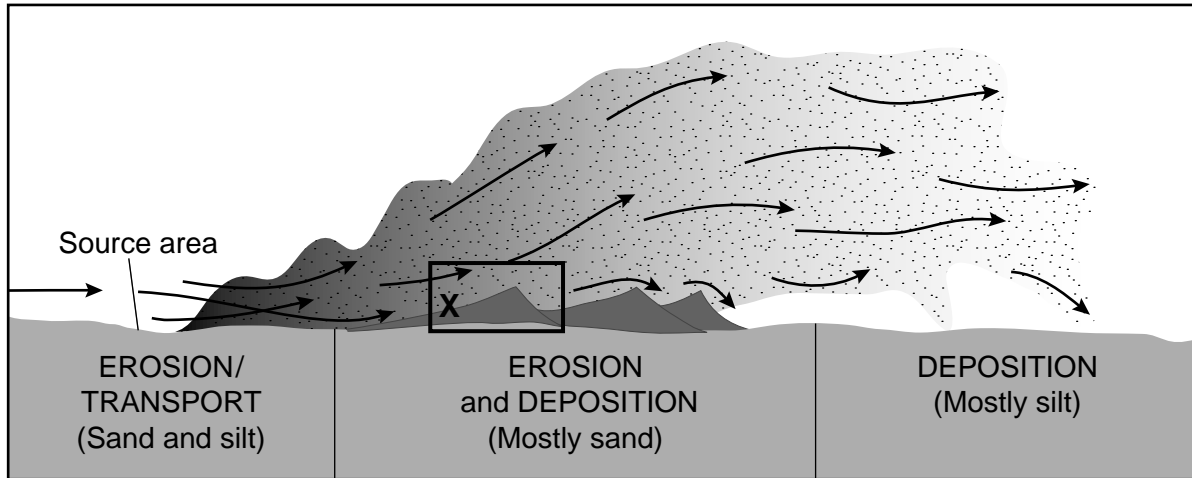
- | | |
|----------|-----------|
| (1) 27 d | (3) 183 d |
| (2) 91 d | (4) 365 d |

Base your answers to questions 44 through 47 on the cross sections below and on your knowledge of Earth science. The cross sections represent three widely spaced rock outcrops labeled A, B, and C. Line XY represents a fault. Overturning has *not* occurred.



- 44 What is the youngest sedimentary rock layer represented in these cross sections?
- (1) black shale
 - (2) brown sandstone
 - (3) tan siltstone
 - (4) conglomerate
- 45 Which sequence shows the relative ages of the igneous intrusion, fault X–Y, unconformity, and red sandstone, from oldest to youngest, in outcrop C?
- (1) unconformity → igneous intrusion → fault X–Y → red sandstone
 - (2) red sandstone → unconformity → igneous intrusion → fault X–Y
 - (3) fault X–Y → unconformity → red sandstone → igneous intrusion
 - (4) igneous intrusion → fault X–Y → red sandstone → unconformity
- 46 Which processes formed the unconformities shown in outcrops B and C?
- (1) folding, faulting, and tilting
 - (2) uplift, erosion, and deposition
 - (3) weathering, abrasion, and igneous intrusion
 - (4) melting, contact metamorphism, and solidification
- 47 Which characteristic of the volcanic ash layer is most useful for correlating rock layers in outcrops A, B, and C?
- (1) The ash was deposited over a large geographic area.
 - (2) The ash layer varies in thickness.
 - (3) Carbon-14 can be used to determine the age of the ash.
 - (4) Igneous rock particles are found in the ash.

Base your answers to questions 48 through 50 on the diagram below and on your knowledge of Earth science. The diagram represents an erosional-depositional system in an arid environment, and indicates the processes occurring at various locations within the atmosphere and on the land surface. The box labeled X identifies one sand dune. Arrows represent the movement of particles.



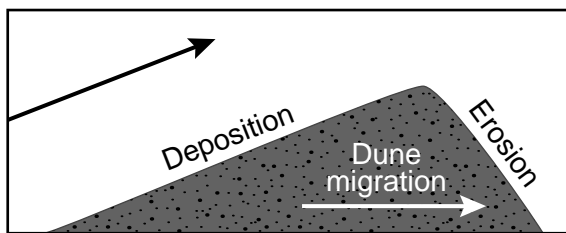
48 Which agent of erosion moves the particles within this erosional-depositional system?

- (1) waves
- (2) wind
- (3) running water
- (4) moving ice

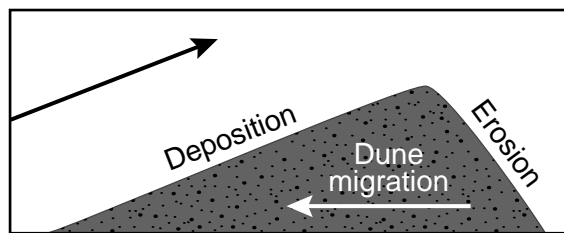
49 The total range of particle sizes indicated in this system is

- (1) less than 0.0004 cm
- (2) 0.0004 to 0.006 cm, only
- (3) 0.006 to 0.2 cm, only
- (4) 0.0004 to 0.2 cm

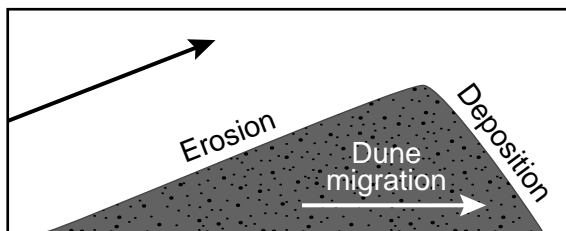
50 Which diagram indicates *both* the direction of dune migration (movement) and the dominant process occurring on each slope of the dune in box X?



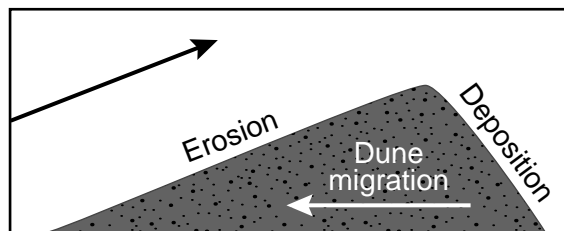
(1)



(3)



(2)



(4)

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 53 on the passage below and on your knowledge of Earth science.

Waimea Canyon

Waimea Canyon is located on the west side of the island of Kauai, Hawaii. Waimea Canyon has been referred to as the “Grand Canyon of the Pacific.” But unlike the Grand Canyon, which was carved through horizontal layers of sedimentary rocks, Waimea Canyon was cut through basalt. The formation of this igneous rock began about 4 million years ago. Numerous lava flows followed as magma rose from deep within Earth. The canyon then was formed over time by erosional agents, causing deep, V-shaped valleys that exposed the basalt layers along the canyon walls.

Over time, the composition of the basalt, where it was exposed at the surface, was changed due to oxidation (rusting) of iron-bearing minerals, such as pyroxene and olivine. The result is a canyon with red rocks and soils.

- 51 Identify the epoch during which the first basalt lava flows occurred on Kauai. [1]
- 52 Identify the dominant agent of erosion that carved Waimea Canyon. [1]
- 53 In addition to pyroxene and olivine, identify the name of *one* other mineral commonly found in basalt that could oxidize to produce red soils. [1]
-

Base your answers to questions 54 through 56 on the map in your answer booklet, on the table below, and on your knowledge of Earth science. The map shows a portion of the Nazca Plate under the southeastern Pacific Ocean. Plate A represents another tectonic plate. The table shows some data for islands and seamounts (undersea volcanoes that do *not* rise above the ocean surface) that originally formed at the Easter Island Hot Spot.

Islands and Seamounts Formed By the Easter Island Hot Spot

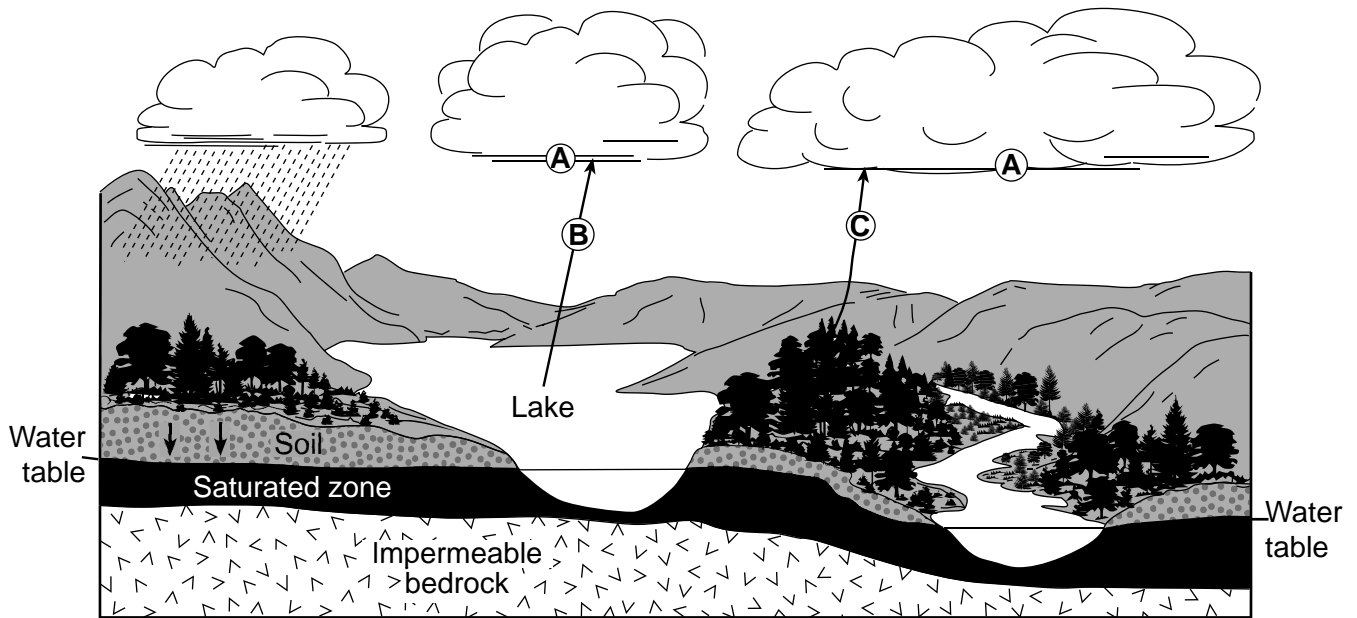
Name	Island or Seamount	Latitude (° S)	Longitude (° W)	Distance from East Pacific Ridge (km)	Age of Oceanic Bedrock (million years)
Easter Island	island	27	109	360	0.3
Sala y Gomez	island	26	105	750	1.7
GS57202-70	seamount	25	98	1500	7.9
18DS	seamount	26	93	2000	11.5
17DS	seamount	25	88	2500	14.9
12DS	seamount	23	83	3100	22.0

54 On the map *in your answer booklet*, plot with **Xs** the locations of the six islands and seamounts formed by the Easter Island Hot Spot. [1]

55 Identify the name of tectonic plate A. [1]

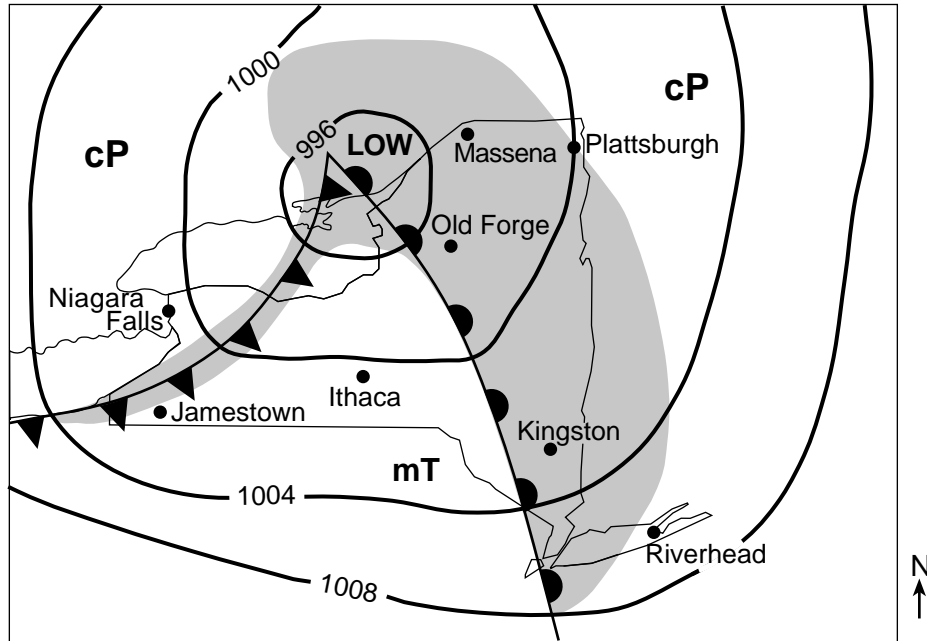
56 Describe the general relationship between the distance from the East Pacific Ridge and the age of the oceanic bedrock of the islands and seamounts. [1]

Base your answers to questions 57 and 58 on the diagram below and on your knowledge of Earth science. The diagram represents the water cycle. Letters A through C identify water cycle processes. Arrows represent movement of water or water vapor. The level of the water table is indicated.



- 57 Water vapor forms a cloud of liquid droplets at location A. State the number of joules per gram of heat energy that is released into the atmosphere during this process. [1]
- 58 Identify the names of the *two* different processes, represented by letters B and C, that return moisture to the atmosphere. [1]

Base your answers to questions 59 through 62 on the weather map below and on your knowledge of Earth science. The map shows the location of a low-pressure system over New York State during late summer. Isobar values are recorded in millibars. Shading indicates regions receiving precipitation. The air masses are labeled. Eight locations in New York State are indicated.



59 Identify the location labeled on the map that will next experience a short burst of heavy precipitation, a change in wind direction, and a rapid decrease in temperature. [1]

60 Convert the air pressure at Plattsburgh, New York, from millibars to inches of mercury. [1]

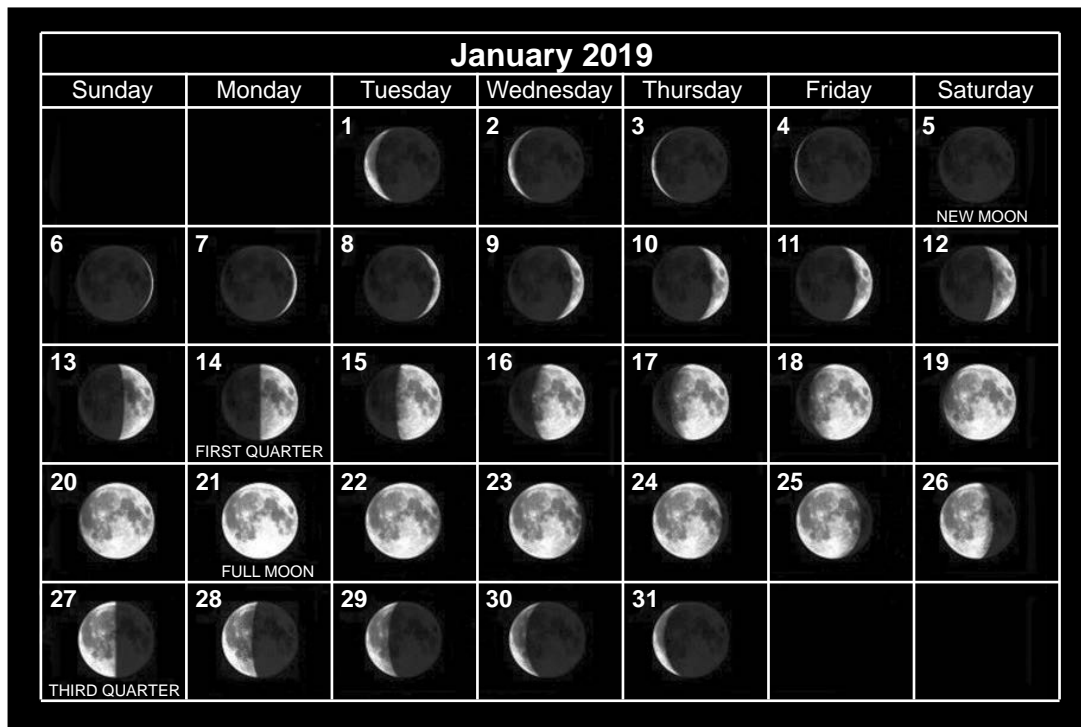
61 The table below lists the weather conditions at Old Forge, New York.

Weather Condition	Data
Temperature (°F)	85
Cloud cover (%)	100
Present weather	Rain showers
Visibility (mi)	$\frac{1}{4}$

On the station model *in your answer booklet*, record *all four* weather conditions for Old Forge using the proper format. [1]

62 Identify the weather instrument used to measure air pressure. [1]

Base your answers to questions 63 through 65 on the calendar below, on the diagram in your answer booklet, and on your knowledge of Earth science. The calendar shows the phases of the Moon for January 2019 as viewed by an observer in New York State. Some phases have been labeled. The diagram on your answer sheet represents eight positions of the Moon in its orbit around Earth.



www.acaoh.org

- 63 In your answer booklet, circle the position of the Moon in its orbit that produced the moon phase observed on January 17, 2019. [1]
- 64 On the diagram in your answer booklet, place an **X** on each of the *two* positions of the Moon in its orbit where neap tides (the smallest difference in the water levels between high tide and low tide) occur. [1]
- 65 A New Moon occurred on January 5, 2019. Determine the date of the New Moon that occurred in February 2019. [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 69 on the topographic map in your answer booklet and on your knowledge of Earth science. Partially drawn contour lines are shown on the southern portion of the map. Points of elevation are recorded in meters. Points *A*, *B*, *C*, and *D* represent locations on Earth's surface. Line *AB* and dashed line *CD* are reference lines.

- 66 On the topographic map *in your answer booklet*, complete the 480-meter, 500-meter, and 520-meter contour lines on the southern portion of the map. [1]
- 67 On the grid *in your answer booklet*, construct a topographic profile along line *AB* by plotting the elevation of each contour line that crosses line *AB*. The elevations of points *A* and *B* have been plotted on the grid. Connect *all nine* plots with a line from *A* to *B* to complete the profile. [1]
- 68 Calculate the gradient, in meters per kilometer, from point *C* to point *D*. [1]
- 69 Describe the evidence shown by the contour lines that indicates that Bry Creek flows downhill in a southwesterly direction. [1]
-

Base your answers to questions 70 through 72 on the passage below and on your knowledge of Earth science.

Carrara Marble

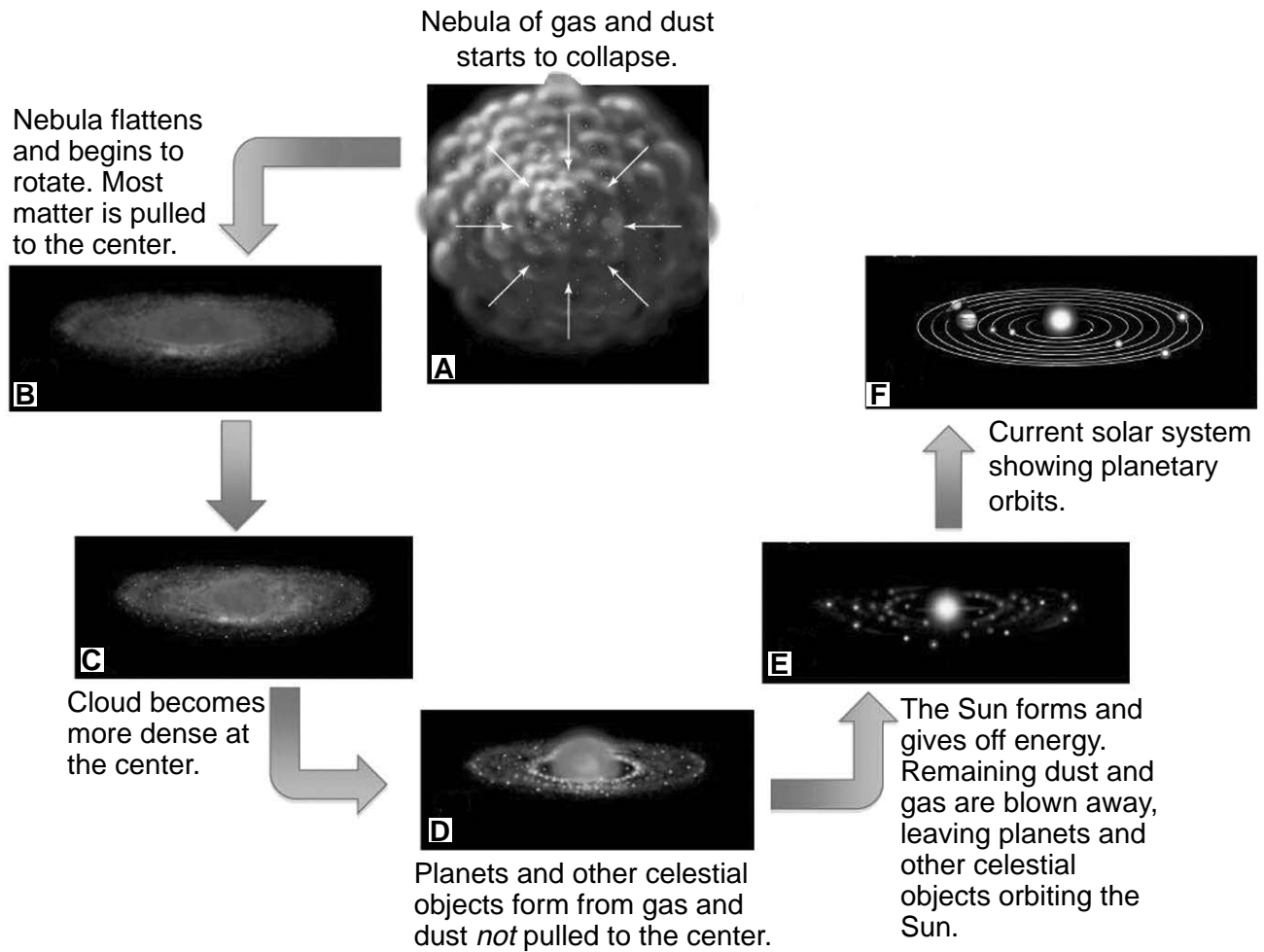
Carrara marble is named for the town of Carrara on the west coast of Italy. This dazzling white marble has been mined since the time of the ancient Romans and remains the major industry of the area today. The marble has many commercial uses, such as tombstones, countertops, tiles, and building stones. Its chemical purity, uniform color, and hardness make this marble an ideal material for artists who carve statues from rock. Major museums around the world have statues carved from Carrara marble.

The formation of Carrara marble began 200 million years ago when a great thickness of tiny shells was deposited at the bottom of a warm, shallow sea. Over time, burial and compaction of these sediments formed sedimentary rock primarily composed of pure calcite. Approximately 27 million years ago, tectonic forces caused this area of the seafloor bedrock to be deformed and metamorphosed, forming the Carrara marble. Uplift and erosion later exposed huge formations of this famous marble.

- 70 Identify the most likely sedimentary rock that formed when the sediments of tiny shells were buried and compacted. [1]
- 71 Identify the change in pressure and the change in temperature that most likely occurred to metamorphose the sedimentary seafloor bedrock into the Carrara marble. [1]
- 72 In terms of mineral properties, explain why a statue is easier to carve from pure white marble rather than from pure white quartzite. [1]
-

GO ON TO THE NEXT PAGE ➞

Base your answers to questions 73 through 75 on the diagram below and on your knowledge of Earth science. The diagram represents the inferred sequence in which our solar system formed from a nebula of gas and dust. Letters *A* through *F* represent different stages in its development.

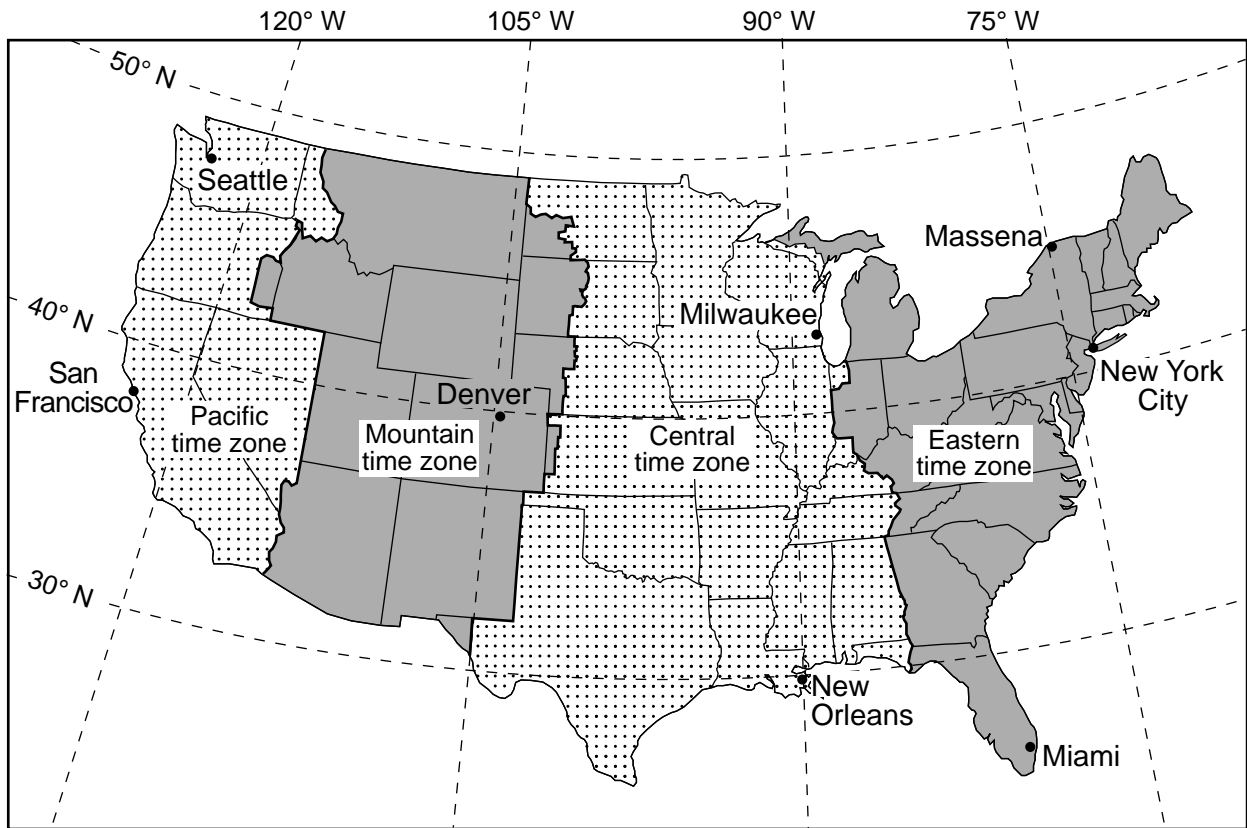


(Not drawn to scale)

Adapted from www.astro.ufl.edu/~reyes/classes

- 73 Identify the force that pulled most matter to the center of the rotating disk in stage *B*. [1]
- 74 Identify the process that produces energy in the core of the Sun at stage *E* by combining lighter elements into heavier elements. [1]
- 75 Most asteroids formed in a belt located between 329 million and 478.7 million kilometers from the Sun. Identify the *two* planets located on either side of the asteroid belt. [1]
-

Base your answers to questions 76 and 77 on the map below and on your knowledge of Earth science. The map shows the four time zones across the continental United States. Eight cities are labeled on the map.

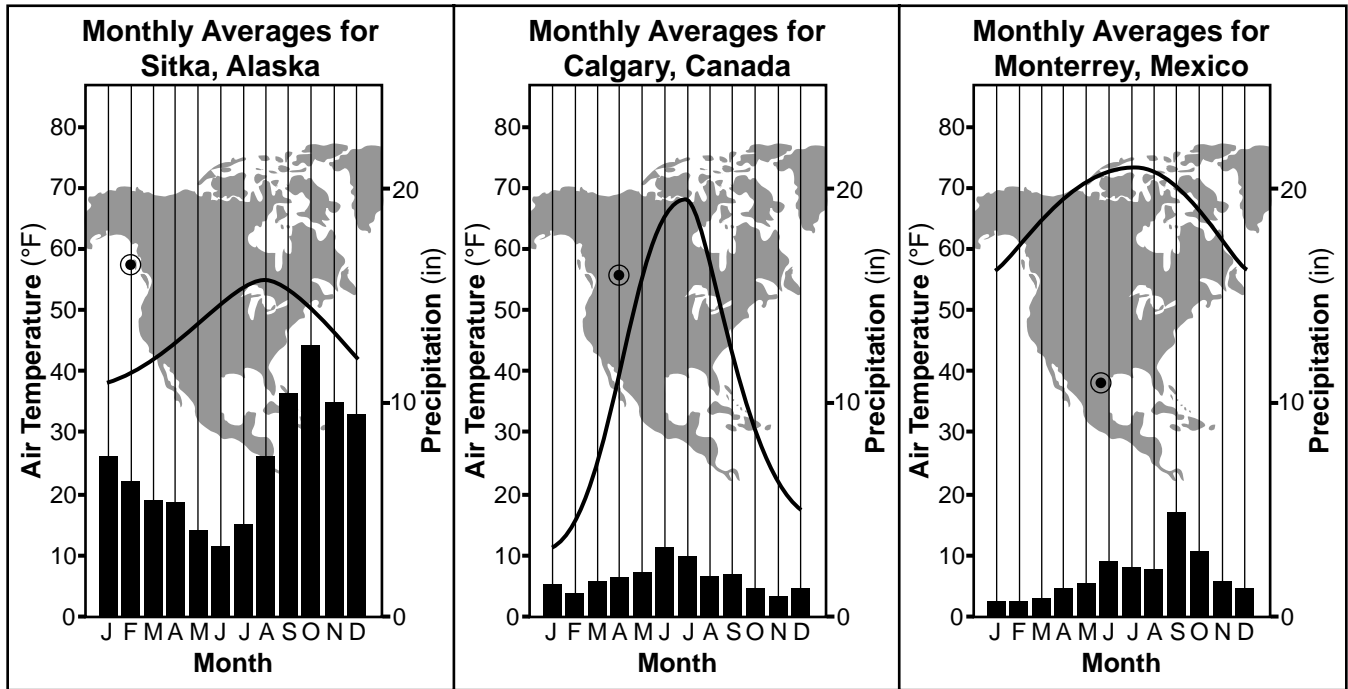


76 State the time at San Francisco, California, when it is 12 noon at New Orleans, Louisiana. Indicate a.m. or p.m. in your answer. [1]

77 Identify the city on the map where the altitude of *Polaris* is closest to 45 degrees. [1]

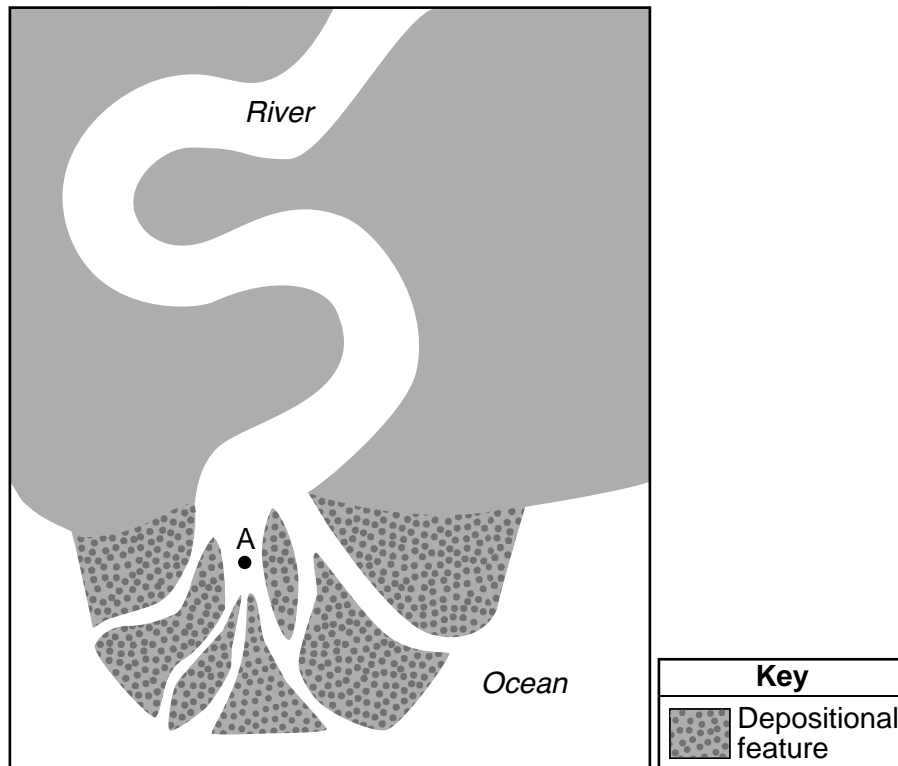
Base your answers to questions 78 through 80 on the graphs below and on your knowledge of Earth science. The climate graphs represent data for three different locations in North America. Line graphs show the average monthly air temperatures in degrees Fahrenheit (°F). Bar graphs show the average monthly precipitation in inches (in). A circled dot (●) indicates each location on the maps.

Climate Graphs



- 78 State *one* reason why the annual temperature range of Calgary, Canada, is greater than the annual temperature range in Sitka, Alaska. [1]
- 79 Explain why the noontime altitude of the Sun (angle of insolation) is greater at Monterrey, Mexico, than at Calgary, Canada, every day of the year. [1]
- 80 Identify the most likely types of precipitation that occur in Calgary, Canada, and Monterrey, Mexico, during January and February. [1]
-

Base your answers to questions 81 and 82 on the map below and on your knowledge of Earth science. The map shows a river and a depositional feature at an ocean shoreline. Point A indicates a location on Earth's surface.



- 81 Identify the name of the depositional feature surrounding location A that is forming where the river enters the ocean. [1]
- 82 Describe how the rocks and sediments are rounded and smoothed as they are being eroded by the water in this river. [1]
-

Base your answers to questions 83 through 85 on the timeline in your answer booklet and on your knowledge of Earth science. The timeline represents the last 600 million years of geologic time. Shaded area A represents the Neogene Period.

- 83 On the timeline *in your answer booklet*, accurately shade in an area to represent the entire Permian Period. [1]
- 84 Identify the name of *one* New York State landscape region where the index fossil *Phacops* may be found in the surface bedrock. [1]
- 85 List the following organisms in order of geologic age from youngest to oldest: earliest mammals, earliest stromatolites, earliest grasses, Earth's first forests. [1]
-

PHYSICAL SETTING EARTH SCIENCE

v202

ANSWER BOOKLET

Student

Teacher

School Grade

Record your answers for Part B-2 and Part C in this booklet.

Part B-2

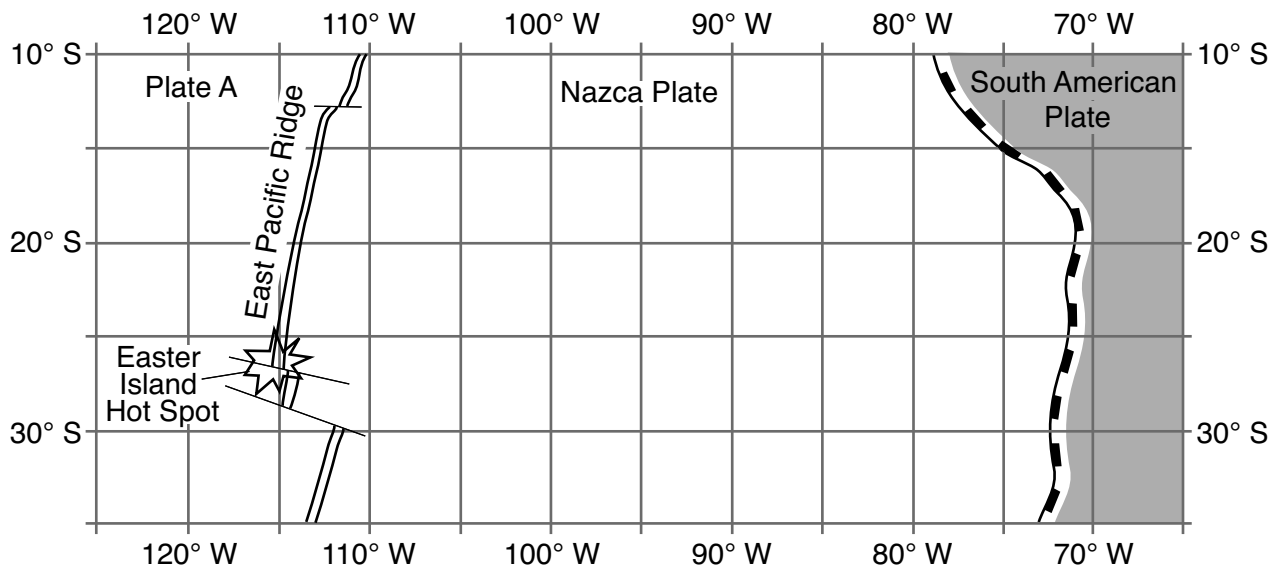
51 _____ Epoch

52 _____

53 _____

54

Southeastern Pacific Ocean



55 _____ Plate

56 _____

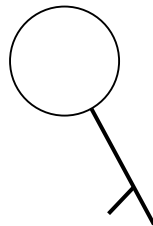
57 _____ J/g

58 B: _____ and C: _____

59 _____

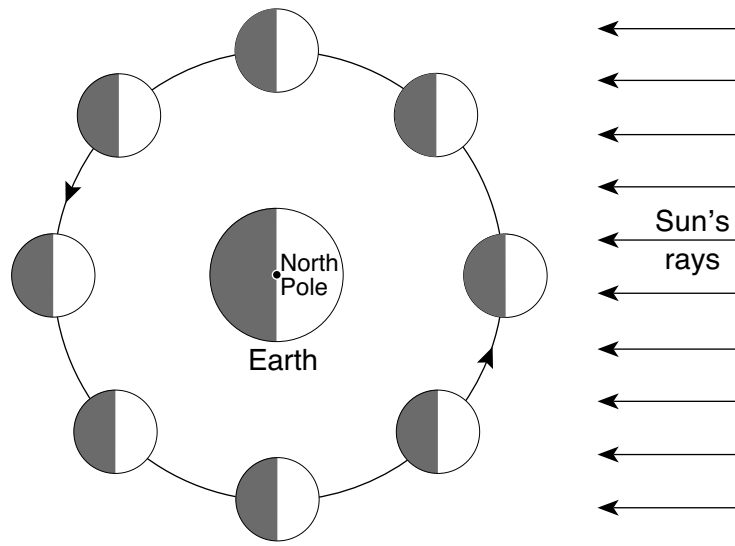
60 _____ in of Hg

61



62 _____

63-64

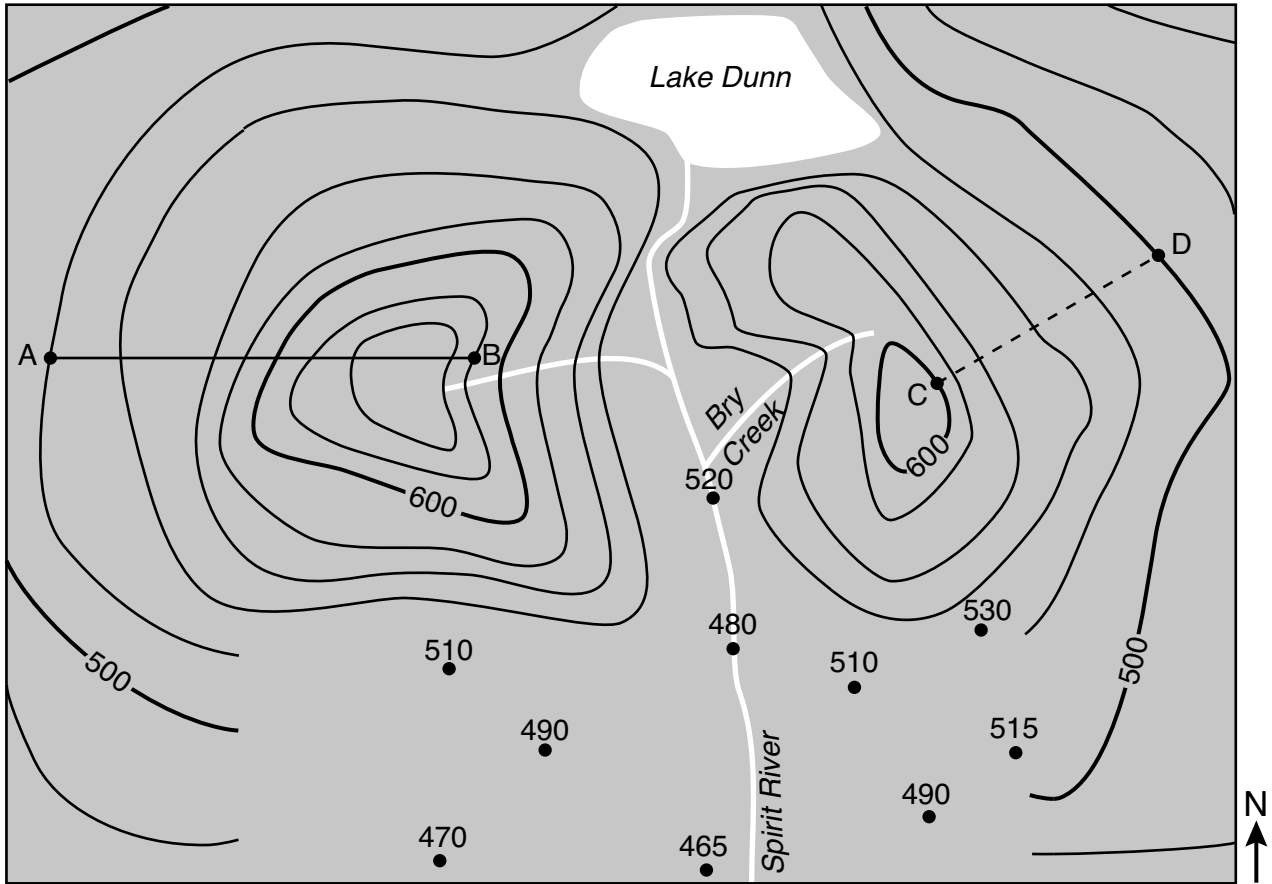


(Not drawn to scale)

65 February _____, 2019

Part C

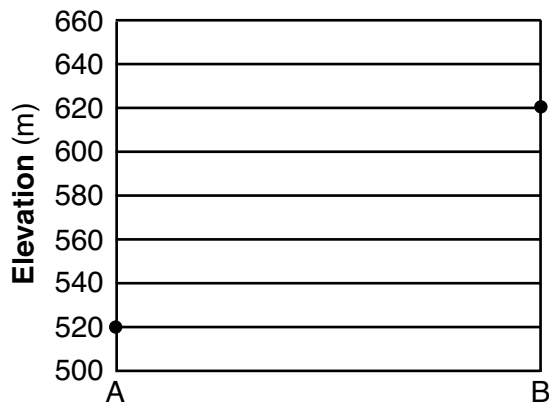
66



0 1 2 3 4 5 6 7 8 kilometers

Contour interval = 20 meters

67



68 _____ m/km

69 _____

70 _____

71 Change in pressure: _____

Change in temperature: _____

72 _____

73 _____

74 _____

75 _____ and _____

76 _____

77 _____

78 _____

79 _____

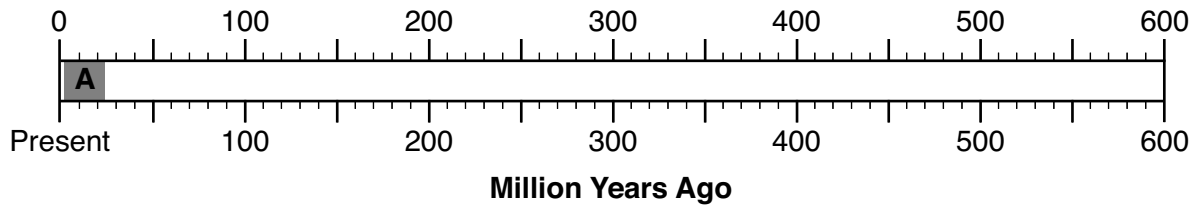
80 Type of precipitation in Calgary: _____

Type of precipitation in Monterrey: _____

81 _____

82 _____

83



84 _____

85 Youngest: _____



Oldest: _____

Updated, June 24, 2021 at 12:30 p.m.

The State Education Department / The University of the State of New York

Regents Examination in Physical Setting/Earth Science – v202

Scoring Key: Parts A and B-1 (Multiple-Choice Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Physical Setting/Earth Science	v202	1	3	MC	1	1
Physical Setting/Earth Science	v202	2	1	MC	1	1
Physical Setting/Earth Science	v202	3	3	MC	1	1
Physical Setting/Earth Science	v202	4	4	MC	1	1
Physical Setting/Earth Science	v202	5	4	MC	1	1
Physical Setting/Earth Science	v202	6	4	MC	1	1
Physical Setting/Earth Science	v202	7	1	MC	1	1
Physical Setting/Earth Science	v202	8	2	MC	1	1
Physical Setting/Earth Science	v202	9	1	MC	1	1
Physical Setting/Earth Science	v202	10	4	MC	1	1
Physical Setting/Earth Science	v202	11	2	MC	1	1
Physical Setting/Earth Science	v202	12	1	MC	1	1
Physical Setting/Earth Science	v202	13	2	MC	1	1
Physical Setting/Earth Science	v202	14	2	MC	1	1
Physical Setting/Earth Science	v202	15	1	MC	1	1
Physical Setting/Earth Science	v202	16	3	MC	1	1
Physical Setting/Earth Science	v202	17	2	MC	1	1
Physical Setting/Earth Science	v202	18	1	MC	1	1
Physical Setting/Earth Science	v202	19	4	MC	1	1
Physical Setting/Earth Science	v202	20	3	MC	1	1
Physical Setting/Earth Science	v202	21	1	MC	1	1
Physical Setting/Earth Science	v202	22	3	MC	1	1
Physical Setting/Earth Science	v202	23	4	MC	1	1
Physical Setting/Earth Science	v202	24	4	MC	1	1
Physical Setting/Earth Science	v202	25	3	MC	1	1
Physical Setting/Earth Science	v202	26	3	MC	1	1
Physical Setting/Earth Science	v202	27	2	MC	1	1
Physical Setting/Earth Science	v202	28	4	MC	1	1
Physical Setting/Earth Science	v202	29	1	MC	1	1
Physical Setting/Earth Science	v202	30	3	MC	1	1
Physical Setting/Earth Science	v202	31	1	MC	1	1
Physical Setting/Earth Science	v202	32	4	MC	1	1
Physical Setting/Earth Science	v202	33	3	MC	1	1
Physical Setting/Earth Science	v202	34	4	MC	1	1
Physical Setting/Earth Science	v202	35	2	MC	1	1
Physical Setting/Earth Science	v202	36	2	MC	1	1
Physical Setting/Earth Science	v202	37	4	MC	1	1
Physical Setting/Earth Science	v202	38	4	MC	1	1
Physical Setting/Earth Science	v202	39	2	MC	1	1
Physical Setting/Earth Science	v202	40	1	MC	1	1
Physical Setting/Earth Science	v202	41	1	MC	1	1
Physical Setting/Earth Science	v202	42	3	MC	1	1
Physical Setting/Earth Science	v202	43	3	MC	1	1
Physical Setting/Earth Science	v202	44	3	MC	1	1
Physical Setting/Earth Science	v202	45	2	MC	1	1
Physical Setting/Earth Science	v202	46	2	MC	1	1
Physical Setting/Earth Science	v202	47	1	MC	1	1
Physical Setting/Earth Science	v202	48	2	MC	1	1
Physical Setting/Earth Science	v202	49	4	MC	1	1
Physical Setting/Earth Science	v202	50	2	MC	1	1

Regents Examination in Physical Setting/Earth Science – v202

Scoring Key: Parts B-2 and C (Constructed-Response Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Physical Setting/Earth Science	v202	51		CR	1	1
Physical Setting/Earth Science	v202	52		CR	1	1
Physical Setting/Earth Science	v202	53		CR	1	1
Physical Setting/Earth Science	v202	54		CR	1	1
Physical Setting/Earth Science	v202	55		CR	1	1
Physical Setting/Earth Science	v202	56		CR	1	1
Physical Setting/Earth Science	v202	57		CR	1	1
Physical Setting/Earth Science	v202	58		CR	1	1
Physical Setting/Earth Science	v202	59		CR	1	1
Physical Setting/Earth Science	v202	60		CR	1	1
Physical Setting/Earth Science	v202	61		CR	1	1
Physical Setting/Earth Science	v202	62		CR	1	1
Physical Setting/Earth Science	v202	63		CR	1	1
Physical Setting/Earth Science	v202	64		CR	1	1
Physical Setting/Earth Science	v202	65		CR	1	1
Physical Setting/Earth Science	v202	66		CR	1	1
Physical Setting/Earth Science	v202	67		CR	1	1
Physical Setting/Earth Science	v202	68		CR	1	1
Physical Setting/Earth Science	v202	69		CR	1	1
Physical Setting/Earth Science	v202	70		CR	1	1
Physical Setting/Earth Science	v202	71		CR	1	1
Physical Setting/Earth Science	v202	72		CR	1	1
Physical Setting/Earth Science	v202	73		CR	1	1
Physical Setting/Earth Science	v202	74		CR	1	1
Physical Setting/Earth Science	v202	75		CR	1	1
Physical Setting/Earth Science	v202	76		CR	1	1
Physical Setting/Earth Science	v202	77		CR	1	1
Physical Setting/Earth Science	v202	78		CR	1	1
Physical Setting/Earth Science	v202	79		CR	1	1
Physical Setting/Earth Science	v202	80		CR	1	1
Physical Setting/Earth Science	v202	81		CR	1	1
Physical Setting/Earth Science	v202	82		CR	1	1
Physical Setting/Earth Science	v202	83		CR	1	1
Physical Setting/Earth Science	v202	84		CR	1	1
Physical Setting/Earth Science	v202	85		CR	1	1

Key
MC = Multiple-choice question
CR = Constructed-response question

The chart for determining students' final examination scores for the **v202 Regents Examination in**

FOR TEACHERS ONLY

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

PHYSICAL SETTING/EARTH SCIENCE

v202

RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 2 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: <http://www.p12.nysed.gov/assessment/> and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Physical Setting/Earth Science. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences*.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the Part B–2 and Part C open-ended questions on a student’s paper. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score more than approximately one-half of the open-ended questions on a student’s answer paper. Teachers may not score their own students’ answer papers.

Students’ responses must be scored strictly according to the Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge as indicated by the examples in the rating guide. Do not attempt to correct the student’s work by making insertions or changes of any kind. On the student’s separate answer sheet, for each question, record the number of credits earned and the teacher’s assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not be given when the wording of the questions allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the space provided. Then the student’s raw scores on the written test should be converted to a scale score by using the conversion chart that will be posted on the Department’s web site at: <http://www.p12.nysed.gov/assessment/> on the day of the exam. The student’s scale score should be entered in the box labeled “Scale Score” on the student’s answer sheet. The scale score is the student’s final examination score.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student’s final score.

Part B–2

Allow a maximum of 15 credits for this part.

To ensure the accuracy of overlays, select a printer setting such as *full*, *actual size*, or *100%* when printing this document. Do **not** select the *fit to page* setting.

51 [1] Allow 1 credit for Pliocene Epoch.

52 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- running water/water
- streams
- rivers

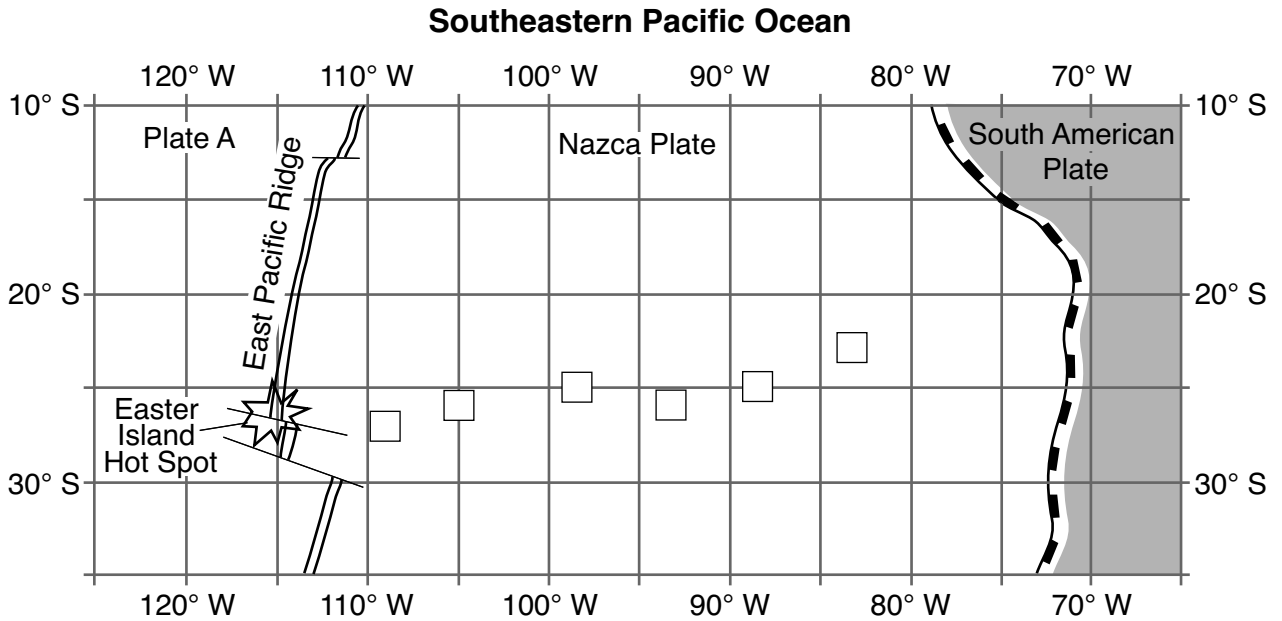
53 [1] Allow 1 credit for amphibole/hornblende *or* biotite mica/biotite.

Note: Do *not* accept “mica” alone because some micas, such as muscovite mica, do not contain iron.

54 [1] Allow 1 credit if the centers of *all six Xs* are within or touch the clear boxes shown below.

Note: Allow credit if a symbol other than an **X** is used.

It is recommended that an overlay of the same scale as the student answer sheet be used to ensure reliability in rating.



55 [1] Allow 1 credit for Pacific Plate.

56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- As distance from the East Pacific Ridge increases, the age of the bedrock of the islands and seamounts increases.
- The farther from the ridge, the older the bedrock.
- Younger bedrock is closer to the ridge.
- direct relationship

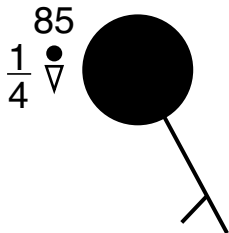
57 [1] Allow 1 credit for 2260 J/g.

58 [1] Allow 1 credit for *both* processes: evaporation *or* vaporization at letter *B* and transpiration *or* evapotranspiration at letter *C*.

59 [1] Allow 1 credit for Jamestown.

60 [1] Allow 1 credit for any value from 29.52 to 29.53 in of Hg.

61 [1] Allow 1 credit if *all four* weather conditions are in the correct locations and in the correct formats, as shown below.

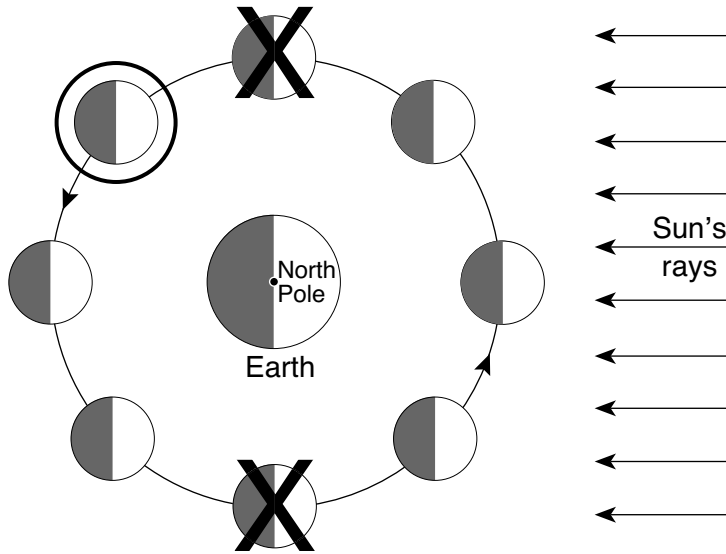


62 [1] Allow 1 credit for barometer *or* barograph.

63 [1] Allow 1 credit for circling *only* the position shown in the example below.

64 [1] Allow 1 credit if the centers of *only two Xs* are placed on the diagram – one to indicate the 1st quarter phase and one to indicate the 3rd quarter phase, as shown below.

Example of a 2-credit response for 63–64:



(Not drawn to scale)

65 [1] Allow 1 credit for February 3, 2019 *or* February 4, 2019.

Part C

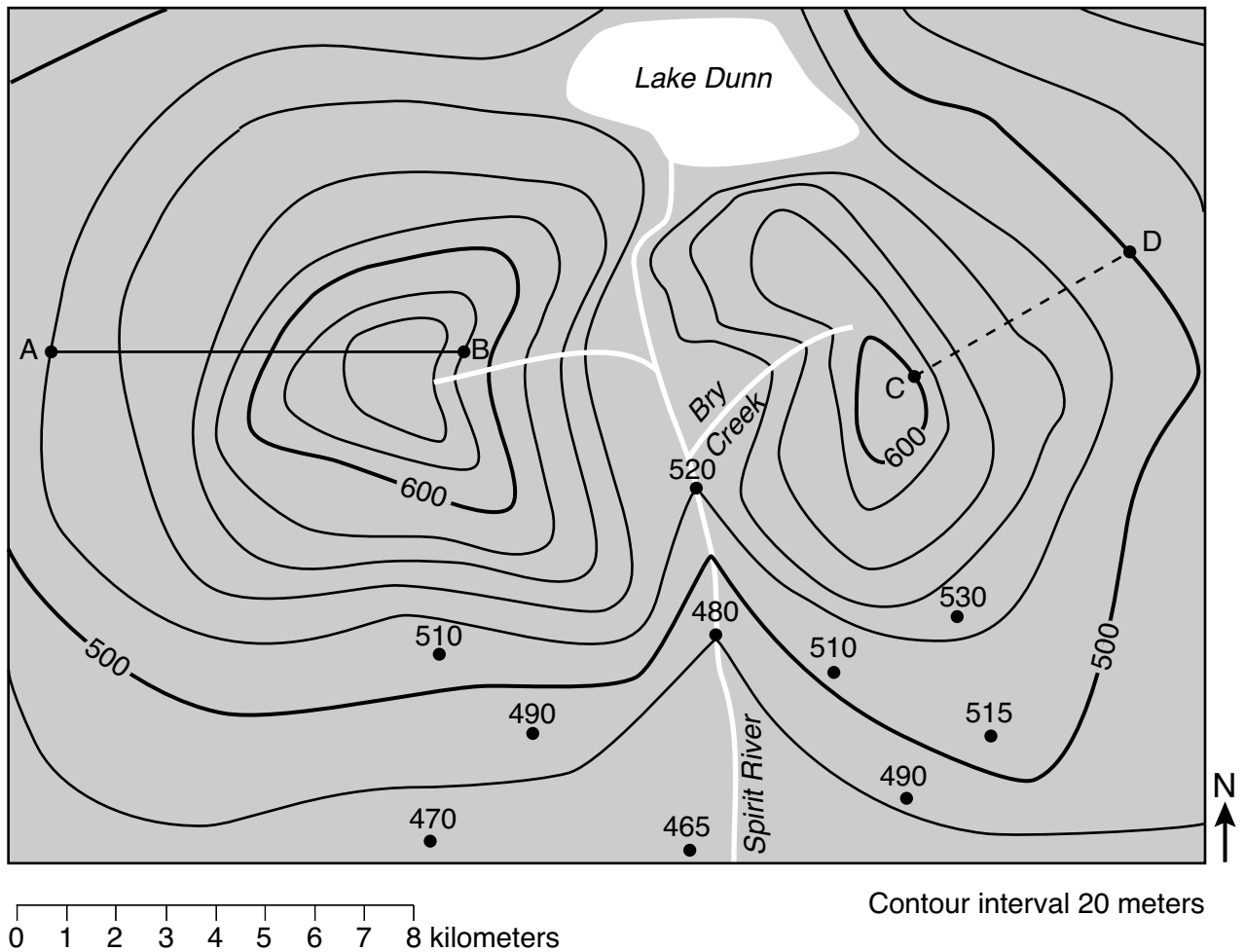
Allow a maximum of 20 credits for this part.

- 66 [1] Allow 1 credit if *all three* contour lines are correctly drawn and connected to the partially drawn contour lines on either side of Spirit River.

Note: If additional contour lines are drawn, all must be correct to receive credit.

Do *not* allow credit if student-drawn contour lines do not pass through or touch the 480 m or 520 m dots.

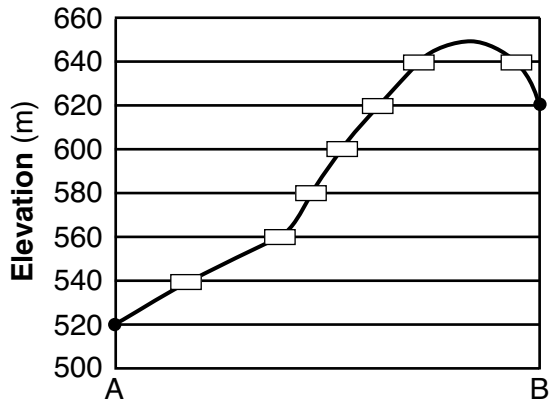
Example of a 1-credit response:



- 67 [1] Allow 1 credit if the centers of *all seven* student plots are within or touch the clear rectangles shown below and *all nine* plots are correctly connected with a line that passes within or touches the rectangles. The line must show the highest elevation above 640 m, but below 660 m.

Note: Allow credit if the line does *not* pass through the student's plots, but is still within or touches the rectangles.

It is recommended that an overlay of the same scale as the student answer sheet be used to ensure reliability in rating.



- 68 [1] Allow 1 credit for any value from 18.8 to 21.2 m/km.

- 69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Contour lines bend upstream when they cross Bry Creek.
 - Contour lines make V shapes that point northeast at Bry Creek.
 - The creek flows out of the open end of the Vs.
 - Bry Creek flows from a higher to a lower contour line.
 - Elevations decrease toward the southwest.

Note: Do *not* allow credit for “water flows downhill” alone because it is stated in the question.

- 70 [1] Allow 1 credit for limestone *or* coquina.

- 71 [1] Allow 1 credit if *both* responses indicate an increase.

Change in pressure:

- increase
- higher/greater

Change in temperature:

- increase
- hotter
- higher

- 72** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The mineral that makes up quartzite is harder than the mineral that makes up marble.
 - The hardness of calcite is only 3 while the hardness of quartz is 7.
 - Marble is softer than quartzite because it is made of calcite, a softer mineral.
- 73** [1] Allow 1 credit for gravity *or* gravitation *or* gravitational pull.
- 74** [1] Allow 1 credit for nuclear fusion *or* fusion.
- 75** [1] Allow 1 credit for Mars and Jupiter.
- 76** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- 10:00 a.m.
 - 10 am
 - 1000 (military time)
 - 10 in the morning
- 77** [1] Allow 1 credit for Massena.
- 78** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Calgary is surrounded by land, which has a lower specific heat than water.
 - Sitka is located near a large body of water, which has a higher specific heat than land materials.
 - The large body of water near Sitka moderates the temperature.
 - Calgary has a continental climate, while Sitka has a maritime climate.
 - Calgary is farther inland.
- 79** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Monterrey is at a lower latitude.
 - Monterrey is closer to the equator.
 - Calgary is farther north.
 - The latitude of the Sun's vertical ray is always closer to Monterrey's location.

80 [1] Allow 1 credit if *both* responses are correct. Acceptable responses include, but are not limited to:

Type of precipitation in Calgary:

- snow/snow showers
- sleet
- freezing rain

Type of precipitation in Monterrey:

- rain/rain showers
- drizzle

Note: Do *not* allow credit for “hail” as the type of precipitation in either Calgary or Monterrey because this is not the most likely type of precipitation that occurs at these locations.

Do *not* allow credit for “thunderstorms” as the type of precipitation in Monterrey because this does not identify the type of precipitation but a meteorological event.

81 [1] Allow 1 credit for delta *or* river delta.

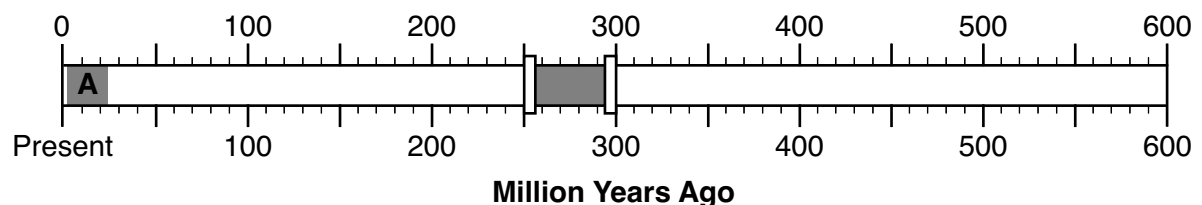
82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- Rocks are rounded by tumbling and having sharp corners wear down or break off.
- weathering by abrading with other sediments or against the streambed
- Abrasion polishes and shapes rocks.
- by scraping, bouncing, and rolling along
- by colliding with other particles in the water

Note: Do *not* allow credit for “water” or “erosion” acting alone because water alone, without sediments, does not abrade rock, and erosion is restating the question.

Do *not* allow credit for “weathering” alone because this term is too general and does not describe how sediments are rounded and smoothed.

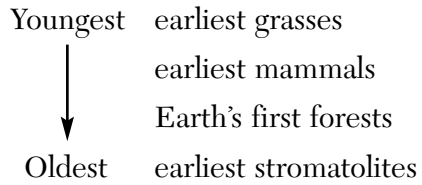
83 [1] Allow 1 credit for a shaded bar that begins and ends within or is touching the clear rectangles shown below.



Note: It is recommended that an overlay of the same scale as the student answer sheet be used to ensure reliability in rating.

- 84 [1] Allow 1 credit. Acceptable responses include:
- Allegheny Plateau/Appalachian Plateau (Uplands)
 - The Catskills
 - Hudson-Mohawk Lowlands
 - Erie-Ontario Lowlands/Interior Lowlands

85 [1] Allow 1 credit if *all four* organisms are listed in the correct order as shown below.



Regents Examination in Physical Setting/Earth Science

v202

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the v202 Regents Examination in Physical Setting/Earth Science* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on the day of the exam. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Earth Science must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to <http://www.p12.nysed.gov/assessment/teacher/evaluation.html>.
2. Select the test title.
3. Complete the required demographic fields.
4. Complete each evaluation question and provide comments in the space provided.
5. Click the **SUBMIT** button at the bottom of the page to submit the completed form.

Map to Core Curriculum

v202 Physical Setting/Earth Science			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		43, 54	67, 68, 83
Math Key Idea 2	1, 3, 14, 22, 25, 26, 30	36, 49, 51, 56, 60	75, 76, 80
Math Key Idea 3	15		66
Science Inquiry Key Idea 1	2	38, 47	72, 73, 74, 77, 78, 79
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	3, 6, 12, 14, 17, 18, 20, 23, 24, 26, 28, 29, 30, 31, 32, 34	43, 49, 51, 52, 53, 55, 57, 60, 61	68, 70, 71, 72, 75, 78, 83, 84, 85
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1		59, 60	
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1	9, 35	40, 46, 48, 50, 59	81
Key Idea 2	10, 11, 15, 16, 20, 21, 22, 23, 27, 29, 33, 35	36, 37, 39, 41, 42, 44, 45, 46, 48, 50, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65	66, 67, 73, 76, 77, 78, 80, 81, 84
Key Idea 3	14		69, 85
Key Idea 4			
Key Idea 5	10, 11, 22	63, 65	71, 76, 82
Key Idea 6			
Standard 7			
Key Idea 1			
Key Idea 2	13		
Standard 4			
Key Idea 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 20, 21, 22, 23, 25	36, 37, 42, 43, 44, 45, 46, 47, 51, 54, 57, 58, 63, 64, 65	75, 76, 77, 83, 85
Key Idea 2	12, 13, 14, 15, 16, 17, 18, 19, 24, 26, 27, 28, 29, 30, 33, 34, 35	38, 39, 40, 41, 48, 49, 50, 52, 55, 56, 59, 60, 61, 62	66, 67, 68, 69, 78, 79, 80, 81, 82, 84
Key Idea 3	31, 32	53	70, 71, 72, 73, 74
Reference Tables			
ESRT 2011 Edition (Revised)	3, 6, 12, 14, 17, 18, 20, 23, 24, 26, 28, 29, 30, 32, 32, 34	43, 49, 51, 53, 55, 57, 60, 61	68, 70, 71, 72, 75, 78, 83, 84, 85

Regents Examination in Physical Setting/Earth Science – v202

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

Raw Score	Scale Score
85	100
84	99
83	99
82	98
81	98
80	97
79	96
78	96
77	95
76	94
75	93
74	93
73	92
72	91
71	91
70	90
69	89
68	88
67	87
66	87
65	86
64	85
63	84
62	83
61	82
60	82
59	81
58	80
57	79

Raw Score	Scale Score
56	78
55	77
54	76
53	75
52	74
51	73
50	72
49	71
48	70
47	69
46	68
45	67
44	66
43	65
42	63
41	62
40	61
39	60
38	59
37	58
36	56
35	55
34	54
33	53
32	51
31	50
30	49
29	47
28	46

Raw Score	Scale Score
27	45
26	43
25	42
24	40
23	39
22	37
21	36
20	34
19	33
18	31
17	30
16	28
15	26
14	25
13	23
12	22
11	20
10	18
9	16
8	15
7	13
6	11
5	9
4	8
3	6
2	4
1	2
0	0

To determine the student’s final examination score, find the student’s total test raw score in the column labeled “Raw Score” and then locate the scale score that corresponds to that raw score. The scale score is the student’s final examination score. Enter this score in the space labeled “Scale Score” on the student’s answer sheet.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart change from one administration to another, it is crucial that for each administration the conversion chart provided for that administration be used to determine the student’s final score. The chart above is usable only for this administration of the Regents Examination in Physical Setting/Earth Science.