- 1. Why are Precambrian gneiss cobbles and boulders commonly found on top of the surface bedrock in the Catskills?
 - 1) The surface bedrock of the Catskills is composed of Precambrian gneiss.
 - 2) The surface bedrock of the Catskills has been overturned.
 - 3) Many meteorites composed of gneiss have landed in the Catskills.
 - 4) Glaciers transported these rocks from the Adirondacks to the Catskills.
- 2. Sediments found in glacial moraines are best described as
 - 1) sorted and layered 3) unsorted and layered
 - 2) sorted and not layered 4) unsorted and not layered
- 3. What is the best evidence that a glacial erratic has been transported?
 - 1) It is located at a high elevation in a mountainous area.
 - 2) It is less than 25 centimeters in diameter.
 - 3) Its composition is different from that of the bedrock under it.
 - 4) It appears to have been intensely metamorphosed.
- 4. The major source of sediments found on the deep ocean bottom is
 - 1) erosion of continental rocks
 - 2) submarine landslides from the mid-ocean ridges
 - 3) icebergs that have broken off of continental glaciers
 - 4) submarine volcanic eruptions
- 5. Unsorted, angular, rough-surfaced cobbles and boulders are found at the base of a cliff. What most likely transported these cobbles and boulders?
 - 1) running water 3) gravity
 - 2) wind 4) ocean currents
- 6. A large, scratched boulder is found in a mixture of unsorted, smaller sediments forming a hill in central New Jersey. Which agent of erosion most likely transported and then deposited this boulder?
 - 1) wind 3) ocean waves
 - 2) a glacier 4) running water
- 7. What change will a pebble usually undergo when it is transported a great distance by streams?
 - 1) It will become jagged and its mass will decrease.
 - 2) It will become jagged and its volume will increase.
 - 3) It will become rounded and its mass will increase.
 - 4) It will become rounded and its volume will decrease.
- 8. Which sediment is most easily picked up and transported by the wind?
 - 1) cobbles 2) pebbles 3) sand 4) silt
- 9. Which agent of erosion was primarily responsible for forming the long, narrow, U-shaped valleys in the Finger Lakes region of New York State?
 - 1) wind 3) meandering streams
 - 2) landslides 4) continental glaciers
- 10. Which color of the visible spectrum has the shortest wavelength?

1) violet 2) blue 3) yellow 4) red

11. The photograph below shows farm buildings partially buried in silt.



Which erosional agent most likely piled the silt against these buildings?

- 1) glacial ice 3) wind
- 2) ocean waves 4) mass movement
- 12. The photograph below shows a large boulder of metamorphic rock in a field in the Allegheny Plateau region of New York State.



The boulder was most likely moved to this location by

- 1) glacial ice 3) streamfiow
 - 4) volcanic action
- 13. Glaciers often form parallel scratches and grooves in bedrock because glaciers
 - 1) deposit sediment in unsorted piles
 - 2) deposit rounded sand in V-shaped valleys
 - 3) continually melt and refreeze

2) prevailing wind

- 4) drag loose rocks over Earth's surface
- 14. Which statement provides the best evidence that New York State's Finger Lakes formed as a result of continental glaciation?
 - 1) The lake surfaces are above sea level.
 - 2) The lakes fill long, narrow U-shaped valleys.
 - 3) The lakes are partially filled with sorted beds of sediment.
 - 4) The lakes are surrounded by sharp, jagged peaks and ridges.

15. The cross sections below show a three-stage sequence in the development of a glacial feature.



Which glacial feature has formed by the end of stage 3?

2) finger lake

3) drumlin

4) parallel scratches

16. The photograph below shows a valley.

1) kettle lake



Which agent of erosion most likely produced this valley's shape?

3) blowing wind

- 1) wave action
- 2) moving ice 4) flowing water
- 17. The photograph below shows a sand dune that formed in a coastal area.



This sand dune was most likely formed by

- 1) water flowing from the left
- 2) water flowing from the right
- 3) wind blowing from the left
- 4) wind blowing from the right
- 18. The particles in a sand dune deposit are small and very well-sorted and have surface pits that give them a frosted appearance. This deposit most likely was transported by
 - 1) ocean currents
 - 2) glacial ice
- 3) gravity
 4) wind

19. The picture below shows a geological feature in the Kalahari Desert of southwestern Africa.



Which process most likely produced the present appearance of this feature?

- 1) wind erosion
- 3) earthquake vibrations
- 2) volcanic eruption 4) plate tectonics
- 20. Base your answer to the following question on The diagram below shows trends in the temperature of North America during the last



What is the total number of major glacial periods that have occurred in North America in the last 200,000 years?

1) 5 2) 2 3) 3 4) 4

21. Which graph best represents the range of particle sizes that can be carried by a glacier?



22. Base your answer to the following question 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.



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

	 age of the glacier direction of glacial moven 	nent	3) 4)	thickness of the glacial ice rate of glacial movement	
23	. How would unsorted piles of transported and deposited?	angular sediments most like	ely b	e 24. Sharp-edged, base of a rock	irregularly shaped sediment particles found at cliff were probably transported by
	 1) wind 2) glaciers 	 3) ocean waves 4) running water 		 gravity wind 	 3) ocean waves 4) running water

the

25. Base your answer to the following question on the map below, which shows a portion of a drumlin field. Elevations are in feet.



These drumlins are composed of sediments transported and deposited directly by glacial ice. These sediments are likely to be

- 1) well-rounded, sand-sized particles
- 2) well sorted in horizontal layers

- 3) unsorted and not in layers
- 4) found underwater, mixed with organic materials
- 26. Shaded areas on the diagrams below show the part of New York State that was covered by glacial ice during the last ice age.



The best inference that can be made from these diagrams is that this glacial ice

- 1) was about 1 mile thick at New York City
- 2) advanced and retreated more than once
- 3) moved more slowly than the glaciers of earlier ice ages
- 4) changed the shape of Lake Ontario
- 27. The diagram below shows sand particles being moved by wind.



At which Earth surface locations is this process usually the most dominant type of erosion?

- 1) deserts and beaches
- 2) deltas and floodplains
- 3) glaciers and moraines
- 4) mountain peaks and escarpments

- 28. Which natural agent of erosion is mainly responsible for the formation of the barrier islands along the southern coast of Long Island, New York?
 - 1) mass movement 3) prevailing winds
 - 2) running water 4) ocean waves
- 29. What is the largest sediment that can be transported by a stream that has a velocity of 125 cm/sec?

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

- 30. Which New York State landscape region has been most extensively changed by ocean wave erosion during the last 200 years?
 - 1) Atlantic Coastal Lowlands
 - 2) Hudson-Mohawk Lowlands
 - 3) St. Lawrence Lowlands
 - 4) Adirondack Mountains

Base your answers to questions 31 and 32 on

the map and cross section below. The map shows the shapes and locations of New York State's 11 Finger Lakes and the locations of some major glacial deposits (moraines) left behind by the last ice age. The cross section shows surface elevations, valley depths, and water depths of the Finger Lakes.



- 34. New York State's Catskills are classified as which type of landscape region?
 - 1) mountain3) lowland2) plateau4) plain
- 36. Which New York State river flows generally southward?

3) Genesee River

4) Hudson River

4) climate and topography

1) St. Lawrence River

2) Niagara River

37. Base your answer to the following question on the three maps below, which show the ice movement and changes at the ice front of an alpine glacier from the years 1874 to 1882. Points A, B. C, D, and E represent the positions of large markers placed on the glacial ice and left there for a period of eight years.



Which statement best describes the changes happening to this glacier between 1874 and 1882?

- 1) The ice front was advancing, and the ice within the glacier was advancing.
- 2) The ice front was advancing, and the ice within the glacier was retreating.
- 3) The ice front was retreating, and the ice within the glacier was advancing.
- 4) The ice front was retreating, and the ice within the glacier was retreating.
- Base your answer to the following question on the diagram which represents a profile of a mountain glacier in the northern United States.



Which cross section best represents the sediment that was transported and deposited by this glacier?



39. Wooden stakes were placed on a glacier in a straight line as represented by A-A' in the diagram below. The same stakes were observed later in the positions represented by B-B'.



The pattern of movement of the stakes provides evidence that

- 1) glacial ice does not move
- 2) glacial ice is melting faster than it accumulates
- 3) the glacier is moving faster in the center than on the sides
- 4) friction is less along the sides of the glacier than in the center
- 40. In which New York State landscape region is most of the surface bedrock composed of metamorphic rock?
 - 1) Adirondacks 3) Erie-Ontario Lowlands
 - 2) Catskills 4) Newark Lowlands
- 41. Which type of rock is most commonly found as an outcrop in the Allegheny Plateau in New York State?

l)	sandstone	3)	basalt
2)	gneiss	4)	slate

42. The map below shows the large delta that formed as the Mississippi River emptied into the Gulf of Mexico.



Which process was primarily responsible for the formation of the delta?

- 1) glacial erosion 3) deposition of sediment
- 2) cementation of sediment 4) mass movement
- 43. The map below shows barrier islands in the ocean along the coast of Texas.



Which agent of erosion most likely formed these barrier islands?

- 1) mass movement 3) streams
- 2) wave action 4) glaciers
- 44. The four particles shown in the table below are of equal volume and are dropped into a column filled with water.

Particle	Shape	Density		
A	flat	2.5 g/cm ³		
В	flat	3.0 g/cm ³		
С	round	2.5 g/cm ³		
D	round	3.0 g/cm ³		

Which particle would usually settle most rapidly?

45. Which type of electromagnetic energy has the longest wavelength?

1) infrared radiation

- 3) ultraviolet radiation4) x-ray radiation
- 2) radio wave radiation

Base your answers to questions **46** and **47** on the diagram below, which shows ocean waves approaching a shoreline. A groin (a short wall of rocks perpendicular to the shoreline) and a breakwater (an offshore structure) have been constructed alone the beach. Letters *A*, *B*, *C*, *D*, and *E* represent locations in the area.



46. The size of the bulge in the beach at position D will

2) increase

- 1) decrease 3) remain the same
- 47. At which location will the beach first begin to widen due to sand deposition?
 - 1) A 2) B 3) C 4) E
- 48. The map below shows a river emptying into an ocean, producing a delta.



Which graph best represents the relationship between the distance from the river delta into the ocean and the average size of sediments deposited on the ocean floor?



49. The map below shows some features along an ocean shoreline.



In which general direction is the sand being moved along this shoreline by ocean (long-shore) currents?

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

50. Which profile best shows the general depositional pattern that occurs when water from a stream enters the ocean?



Base your answers to questions 51 through 53 on the contour map below, which shows a hill formed by glacial deposition near Rochester, New York. Letters A through E are reference points. Elevations are in feet.



- 2) sorted and not layered
- 52. This glacial deposit is best identified as

1) a V-shaped valley 2) a sand dune

- 4) unsorted and layered
- 3) a drumlin
- 4) an outwash plain

53. The hill shown on this map is found in which New York State landscape region?

- 1) Adirondack Mountains
- 2) Catskills

- 3) Atlantic Coastal Plain 4) Erie-Ontario Lowlands
- 54. Which two locations are in the same New York State landscape region?
 - 1) Albany and Old Forge
 - 2) Massena and Mt. Marcy
 - 3) Binghamton and New York City
 - 4) Jamestown and Ithaca
- 55. Which cross section best represents the general bedrock structure of New York State's Allegheny Plateau?



56. The map below shows a meandering river. Points A and B are locations on the banks of the river.



What are the dominant processes occurring at locations A and B?

- 1) deposition at location A; erosion at location B
- 2) erosion at location A; deposition at location B
- 3) deposition at both locations A and B
- 4) erosion at both locations A and B
- 57. When the velocity of a stream suddenly decreases, the sediment being transported undergoes an increase in
 - 1) particle density 3) deposition
 - 2) erosion 4) mass movement
- 58. What is the basic difference between ultraviolet, visible, and infrared radiation?
 - 1) half-life 3) wavelength
 - 4) wave velocity 2) temperature
- 59. When electromagnetic energy travels from air into water, the waves are bent due to the density differences between the air and water. This bending is called

1) reflection	3) scattering
2) refraction	4) absorption

2) refraction

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



At which location is the greatest amount of sediment most likely being deposited?

- 1) A 2) *B* 3) C 4) D
- 61. The satellite photograph below shows a geologic feature composed of silt, sand, and clay.



The geologic feature shown in the photograph was primarily deposited by which agent of erosion?

- 1) glaciers 3) wave action
- 2) wind 4) running water
- 62. Which statement about electromagnetic energy is correct?
 - 1) Violet light has a longer wavelength than red light.
 - 2) X-rays have a longer wavelength than infrared waves.
 - 3) Radar waves have a shorter wavelength than ultraviolet rays.
 - 4) Gamma rays have a shorter wavelength than visible light.
- 63. What happens to most of the sunlight that strikes a dark-colored area of the Earth's surface?
 - 1) It is reflected and scattered as potential energy.
 - 2) It is reflected and diffused as ultraviolet radiation.
 - 3) It is absorbed and reflected as light.
 - 4) It is absorbed and reradiated as heat.

64. Base your answer to the following question on the diagram below, which shows part of a landscape region. Letter A indicates a steep cliff formed at the edge of the surface rock layer.



In which type of landscape region is this area located?

1) plateau 3) mountain 4) alluvial fan 2) plain

65. Base your answer to the following question on the block diagram below, which represents the landscape features associated with a meandering stream. WX is the location of a cross section. Location A indicates a landscape feature.



(Not drawn to scale)

Which cross section best represents the shape of the stream bottom at WX?



66. Changing the shingles on the roof of a house to a lighter color will 68. Scientists are concerned about the decrease in ozone in the upper most likely reduce the amount of solar energy that is atmosphere primarily because ozone protects life on Earth by absorbing certain wavelengths of 3) reflected 1) x-ray radiation

- 3) infrared radiation
- 2) ultraviolet radiation
- 4) microwave radiation
- 69. Energy is transferred from the Sun to Earth mainly by
 - 1) molecular collisions
- 3) electromagnetic waves
- 2) density currents
- 4) red shifts

1) x ray 2) ultraviolet

1) scattered

2) absorbed

3) infrared 4) radio wave

4) refracted

radiated back into space as which type of electromagnetic radiation?

67. Most of the solar radiation absorbed by Earth's surface is later

70. The diagram below shows the types of electromagnetic energy given off by the Sun. The shaded part of the diagram shows the approximate amount of each type actually reaching Earth's surface.



Which conclusion is best supported by the diagram?

- 1) All types of electromagnetic energy reach Earth's surface.
- 2) Gamma rays and x-rays make up the greatest amount of electromagnetic energy reaching Earth's surface.
- 3) Visible light makes up the greatest amount of electromagnetic energy reaching Earth's surface.
- 4) Ultraviolet and infrared radiation make up the greatest amount of electromagnetic energy reaching Earth's surface.
- 71. Base your answer to the following question on The cross section below shows two compartments of water of equal volume insulated by Styrofoam and separated by a metal dividing wall, forming a closed energy system.



When the temperature of the water in compartment A decreases by 10° C, the temperature of the water in compartment B will

- 1) remain unchanged
- 2) decrease by only 5°C
- 3) decrease by approximately 10°C
- 4) increase by approximately 10°C
- 72. Base your answer to the following question on The diagram below shows a solid iron bar that is being heated in a flame.



The primary method of heat transfer in the solid iron bar is

- 1) convection
- 3) absorption 4) advection
- 2) conduction

73. Base your answer to the following question on the diagram below. The diagram shows the pattern of air movement within a closed room.



What color should the heat source in the room be painted in order to radiate the most heat?

- 3) green 1) red 2) black 4) silver
- 74. Water vapor crystallizes in the atmosphere to form snowflakes. Which statement best describes the exchange of heat energy during this process?
 - 1) Heat energy is transferred from the atmosphere to the water vapor.
 - 2) Heat energy is released from the water vapor into the atmosphere.
 - 3) Heat energy is transferred equally to and from the water vapor.
 - 4) No heat energy is exchanged between the atmosphere and the water vapor.
- 75. During which phase change will the greatest amount of energy be absorbed by 1 gram of water?
 - 1) melting 3) evaporation
 - 4) condensation 2) freezing
- 76. When 1 gram of liquid water at 0° Celsius freezes to form ice, how many total Joules of heat are lost by the water?

1) 4.18 2) 2.11 3) 334 4) 2260 77. Base your answer to the following question on the cross section below and on your knowledge of Earth science. The cross section shows the general movement of air within a portion of Earth's atmosphere located between 30° N and 30° S latitude. Numbers 1 and 2 represent different locations in the atmosphere.



(Not drawn to scale)

The air movement shown in the cross section is due to the process of

1) condensation2) conduction3) evaporation	4) convection		
78. Which phase change requires water to gain 2260 Joules per gram?	82. Earth's atmosphere is warmed when		
 solid ice melting liquid water freezing liquid water freezing water vapor condensing What is the heat energy required to change 2 grams of liquid water 	 ultraviolet radiation emitted by Earth is absorbed by nitrogen and carbon dioxide in the atmosphere x-ray radiation emitted by Earth is absorbed by nitrogen and 		
at 100°C to water vapor at 100°C?	carbon dioxide in the atmosphere		
1) 334 J 2) 668 J 3) 2260 J 4) 4520 J	dioxide and water vapor in the atmosphere		
80. Base your answer to the following question on The diagram below shows a greenhouse.	 gamma radiation emitted by Earth is absorbed by carbon dioxide and water vapor in the atmosphere 		
Clear glass	83. Which weather variable can be determined by using a psychrometer?		
	 barometric pressure relative humidity cloud cover wind speed 		
	84. The diagram below represents the path of visible light as it travels from air to water to air through a glass container of water.		
	Path of light ray		
Greenhouse			
what is the primary function of the clear glass of the greenhouse?	Air Water		
1) The glass reduces the amount of insolation entering the greenhouse.	The light did <i>not</i> travel in a straight line because of		
2) The glass allows all wavelengths of radiation to enter and all	1) convection 3) absorption		
wavelengths of radiation to escape. 3) The glass allows short wavelengths of radiation to enter, but	2) scattering 4) refraction 85. Which gas in the atmosphere has the most influence on day to day		
reduces the amount of longwavelength radiation that escapes.	weather changes?		
 The glass allows long wavelengths of radiation to enter, but reduces the amount of shortwavelength radiation that escapes. 	1) ozone 3) water vapor		
81. What is the relative humidity when the dry-bulb temperature is 16°C and the wet-bulb temperature is 14°C?	2) oxygen 4) carbon dioxide		
1) 90% 2) 80% 3) 14% 4) 13%			

86. The arrows in the block diagram below show the movement of water after it has fallen as precipitation.



Which arrow indicates the process of transpiration?

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

- 87. A student uses a sling psychrometer outdoors on a clear day. The dry-bulb (air) temperature is 10°C. The water on the wet bulb will most likely
 - 1) condense, causing the wet-bulb temperature to be higher than the air temperature
 - 2) condense, causing the wet-bulb temperature to be equal to the air temperature
 - 3) evaporate, causing the wet-bulb temperature to be lower than the air temperature
 - 4) evaporate, causing the wet-bulb temperature to be equal to the air temperature
- 88. A container of water is placed in an open outdoor area so that the evaporation rate can be observed. The water will most likely evaporate fastest when the weather is
 - 1) cool, humid, and windy 3) warm, humid, and calm
 - 2) cool, dry, and calm 4) warm, dry, and windy
- 89. Which graph best represents the relationship between the moisture-holding capacity (ability to hold moisture) of the atmosphere and atmospheric temperature?



90. On a cold winter day, the air temperature is 2° C and the wet-bulb temperature is -1° C. What is the relative humidity at this location?

1) 6% 2) 37% 3) 51% 4) 83%

91. All of the containers shown below contain the same volume of water and are at room temperature. In a two-day period, from which container will the *least* amount of water evaporate?



- 92. Liquid water will continue to evaporate from the Earth's surface, increasing the amount of atmospheric water vapor, until
 - 1) transpiration occurs
 - 2) the relative humidity falls below 50%
 - 3) the atmosphere becomes saturated
 - 4) the temperature of the atmosphere becomes greater than the dewpoint temperature
- 93. When a person leaves the ocean after swimming on a windy day, the person usually feels cold because
 - 1) water evaporates from the skin
 - 2) water condenses on the skin
 - 3) salt is absorbed through the skin
 - 4) radiation is absorbed through the skin
- 94. The graph below shows the average concentration of ozone in Earth's atmosphere over Arizona during 4 months of the year.



Which layer of Earth's atmosphere contains the greatest concentration of ozone?

1) troposphere	3) mesosphere
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2) stratosphere 4) thermosphere

95. Why do most clouds form in the troposphere?

- 1) Air pressure rises with increasing altitude.
- 2) The dewpoint is too high in the other layers of the atmosphere.
- 3) The other layers of the atmosphere are too cold to contain water.
- 4) The lowest 11 km of the atmosphere contains almost all of the atmospheric water vapor.

Base your answers to questions 96 through 98 on

the map below, which shows a portion of the continent of North America and outlines the Mississippi River watershed. Points *A*, *B*, *C*, *D*, and *E* represent locations on Earth's surface.



Answer Key

term 4 practice

1.	4	42.	3	83.	3
2.	4	43.		84.	4
3.	3	44.		85.	3
4.	1	45.		86.	2
5.	3	46.		87.	3
6.	2	47.		88.	4
7.	4	48.	1	89.	2
8.	4	49.	2	90.	3
9.	4	50.		91.	1
10.	1	51.	3	92.	3
11.	3	52.	3	93.	1
12.	1	53.		94.	2
13.	4	54.		95.	4
14.	2	55.		96.	1
15.	1	56.		97.	1
16.	2	57.	3	98.	4
17.	4	58.	3	99.	1
18.	4	59.		100.	1
19.	1	60.	3		
20.	2	61.			
21.	3	62.			
22.	2	63.			
23.	2	64.	1		
24.	1	65.	1		
25.	3	66.			
26.	2	67.	3		
27.	1	68.	2		
28.	4	69.	3		
29.	2	70.	3		
30.	1	71.	4		
31.	3	72.	2		
32.	2	73.	2		
33.	4	74.	2		
34.	2	75.	3		
35.	1	76.	3		
36.		77.	4		
37.	3	78.	3		
38.	4	79.	4		
39.	3	80.	3		
40.	1	81.	2		
41.	_1	82.	3		