The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

LIVING ENVIRONMENT

Wednesday, June 15, 2016 — 9:15 a.m. to 12:15 p.m., only

Student Name _____

School Name _____

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.

Print your name and the name of your school on the lines above.

A separate answer sheet for multiple-choice questions in Parts A, B–1, B–2, and D has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

You are to answer all questions in all parts of this examination. Record your answers for all multiple-choice questions, including those in Parts B–2 and D, on the separate answer sheet. Record your answers for all open-ended questions directly in this examination booklet. All answers in this examination booklet 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 the answer sheet or in this examination booklet as directed.

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 cannot be accepted if you fail to sign this declaration.

Notice...

A four-function or scientific calculator must be made 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. [30]

Directions (1–30): For *each* statement or question, record on the separate answer sheet the *number* of the word or expression that, of those given, best completes the statement or answers the question.

1 Which statement is an example of the interdependence of organisms?

(1) Owls hunt at night.
(2) Ants get food from insects and protect insects from predators.
(3) Ticks feed on the blood of animals and the ticks grow larger.
(4) Crows feed on dead mice.

2 Residents of a town are concerned that a recently built factory could pose health risks. Scientists were asked to investigate the effects of the factory on the health of local residents. The most relevant information they reported was that

(1) in a survey, residents felt that the air in town looks dirtier now
(2) there have been reports that other types of factories have been linked with health issues
(3) residents have occasionally seen smoke coming from the factory
(4) local medical facilities have recently reported a 15% increase in the number of patients treated for asthma

3 Farmers may someday clone their best milk-producing cow into a whole herd. What potential disadvantage might be important to consider in having such a large group of clones on one farm?

(1) It may be difficult to tell the animals apart.
(2) Lack of variation may limit survival in the herd.
(3) The cows could be fertilized by only one type of bull.
(4) The cows could be mated only with each other.

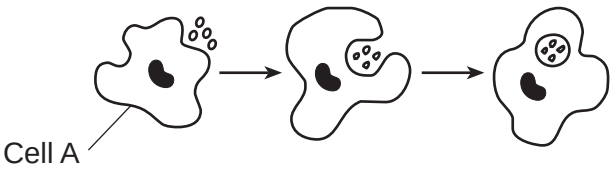
4 DNA replication occurs in preparation for

(1) mitosis, only
(2) meiosis, only
(3) both mitosis and meiosis
(4) neither mitosis nor meiosis

5 An individual eats a hamburger. Which two systems must interact to transfer the nutrients in the hamburger to human muscle tissue?

(1) respiratory and excretory
(2) digestive and immune
(3) digestive and circulatory
(4) circulatory and respiratory

6 The diagram below shows cell *A* completing a life process.



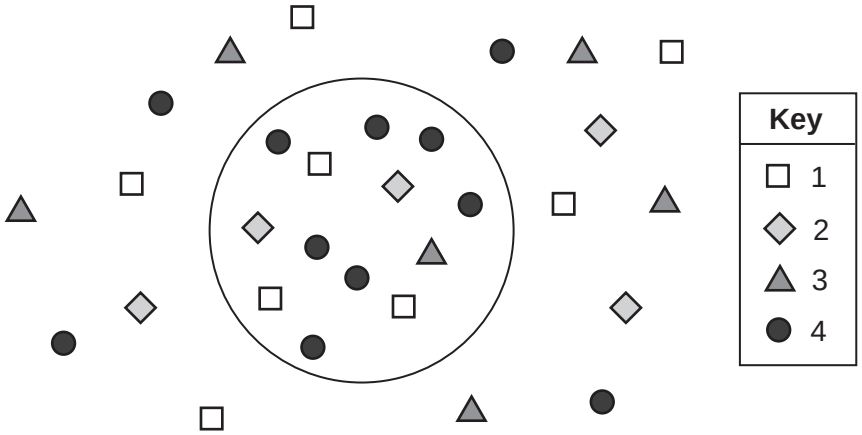
Cell *A* performs functions similar to the tissues and systems in complex, multicellular organisms. This process results in

(1) increased genetic variation
(2) the maintenance of homeostasis
(3) a reduction in competition
(4) increased autotrophic nutrition

7 The shape of a protein molecule directly determines its

(1) movements through the cytoplasm
(2) functions inside and outside of cells
(3) roles in building water molecules
(4) circulation throughout the body

8 The diagram below represents a cell and some molecules in its environment.



Which molecule would require the use of energy in order to be brought into the cell?

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

9 Many domestic plants that are currently used for food by humans share a wild plant ancestor. The changes that have occurred in four common plants and the results are shown in the chart below.

Wild Plant Ancestor	Change That Occurred	Resulting Modern Plant
wild mustard	reduced flower development	broccoli
wild mustard	sterile flowers	cauliflower
wild mustard	enlargement of leaves	kale
wild mustard	shortened stem length	cabbage

What event most likely produced the changes that occurred in the wild plant ancestor?

(1) Mutations in wild mustard sex cells were passed on to offspring.
(2) Humans did not like to eat wild mustard.
(3) Competition for survival occurred in all ecosystems of the world.
(4) Ancient herbivores overgrazed wild mustard.

10 A strand of DNA in a skin cell contains the bases:

A-T-G-C-C-A-T-C-G-G-T-A

After the cell is exposed to ultraviolet light, the strand contains the bases:

A-T-G-G-C-C-A-T-C-G-G-T-A

Which statement describes the result of this exposure?

(1) A new base has been inserted.
(2) A base has been deleted.
(3) One base has been substituted for another.
(4) There have been no changes in the bases.

11 An ameba, a one-celled organism, can move, ingest, and transport materials within the cell, because it has

(1) organs
(2) organelles
(3) tissues
(4) systems

12 In humans, the placenta is essential to the embryo for

(1) nutrition, excretion, and reproduction
(2) respiration, nutrition, and excretion
(3) movement, reproduction, and nutrition
(4) coordination, movement, and growth

13 A student infected by a common cold virus ran a low-grade fever. After a few days, the student's temperature returned to normal and the student was free of cold symptoms. The fever served as

(1) an antigen in the circulatory system
(2) an immune response to a pathogen
(3) a biological catalyst
(4) a weakened pathogen

14 Many animals have developed courtship behaviors. Males will often dance, swim, or sing in a particular way to attract a female. Males who are more successful at the courtship behavior will have a greater chance of having more offspring. This behavior is a result of

(1) natural selection
(2) genetic engineering
(3) asexual reproduction
(4) gene manipulation

15 After a zygote is formed, specialization of cells occurs. Through which process do the cells of a zygote become specialized?

(1) sexual reproduction
(2) meiosis
(3) fertilization
(4) differentiation

16 A farmer wanted to rid his apple trees of a particular leaf-eating insect. He sprayed his trees with an insecticide that killed 98% of the insects. The survival of 2% of this population of insects is most likely due to

(1) genes obtained from another species
(2) certain chemicals that stimulated overproduction
(3) variations that resulted from sexual reproduction
(4) their ability to produce food from the pesticide

17 Which occurrence represents an example of evolution?

(1) Exposure to radiation reduces the rate of mutation in leaf cells.
(2) A mutation in a liver cell causes a person to produce an enzyme that is less efficient.
(3) Cells in a zygote eventually change into bone cells or skin cells.
(4) Some antibiotics are almost useless, because pathogens have developed a resistance to these antibiotics.

18 Populations of aspen trees in the western United States are being destroyed by an unexplained illness. The altered landscape is affecting the animals that live there. Populations of deer mice are increasing greatly in these areas. Unfortunately, these mice often carry a virus that is deadly to humans. This scenario best illustrates that

(1) a change in the environment always results in disease
(2) humans are the cause of the breakdown of this ecosystem
(3) the stability of this ecosystem is limited by the amount of water available
(4) every population in an ecosystem is linked with other populations

19 The paramecium is a single-celled organism that reproduces asexually. The offspring of a paramecium usually contain

(1) only half of the genes of the parent cells
(2) more DNA than the parent cell
(3) genetic material identical to that of the parent cell
(4) fewer mutations than the parent cell

20 A dead or weakened pathogen used to establish immunity would most likely be found in

(1) a pesticide
(2) an antibiotic
(3) a vaccine
(4) a toxin

21 Which statement is true for all of the organisms in the ecosystem represented in the diagram below?

(1) They use energy to combine the inorganic molecules carbon dioxide and water into energy-rich organic compounds.
(2) Stored energy cannot be used by these organisms as a source of energy for life processes.
(3) Energy stored in inorganic molecules is released during cellular respiration in these organisms.
(4) Energy is used by the organisms to obtain and transport materials, and to eliminate wastes.

22 When a natural disaster destroys a stable ecosystem, the area is temporarily less stable than before. This is most likely due to

(1) a decrease in biodiversity
(2) an increase in the number of food chains
(3) an increase in the number of species
(4) a decrease in the rate of mutation

23 An individual walks out of his air-conditioned (75°F) home into the hot outside environment (85°F). His ability to adjust to this changing environment involves a mechanism similar to

(1) the regulation of water loss by guard cells in plant leaves
(2) the digestion of carbohydrates by enzymes
(3) using ATP for the diffusion of water
(4) glucose production in the pancreas

24 Nonrenewable resources are

(1) not finite and are not depleted over time
(2) not finite and are depleted over time
(3) finite and are not depleted over time
(4) finite and are depleted over time

25 Dodder, a plant with no chlorophyll, grows on a living plant of a different species from which it obtains nutrients. Which pair of terms describes this relationship?

(1) parasite and host
(2) predator and prey
(3) producer and decomposer
(4) consumer and scavenger

26 Three human hormones most directly involved in sexual reproduction are

(1) estrogen, insulin, and progesterone
(2) testosterone, estrogen, and insulin
(3) progesterone, ATP, and testosterone
(4) estrogen, progesterone, and testosterone

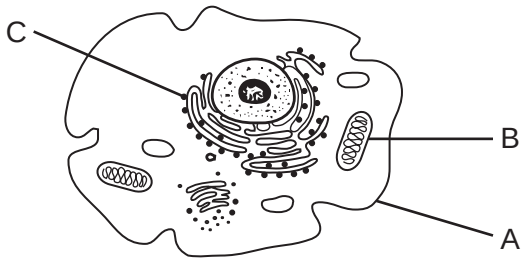
27 At one point, scientists observed that the ozone shield was getting thinner. They warned that the loss of the effectiveness of this shield may lead to an increase in

(1) allergies to ozone
(2) mutations that lead to cancer
(3) viral diseases, such as AIDS
(4) ice formation at the poles

28 As it grows from a seed to a mature plant, a plant will grow taller and thicker. Which are abiotic factors most responsible for the increase in the mass of the plant?

(1) water, minerals, bacteria
(2) sunlight, oxygen, plant receptors
(3) minerals, water, plant enzymes
(4) water, sunlight, carbon dioxide

29 Structures in an animal cell are represented in the diagram below.

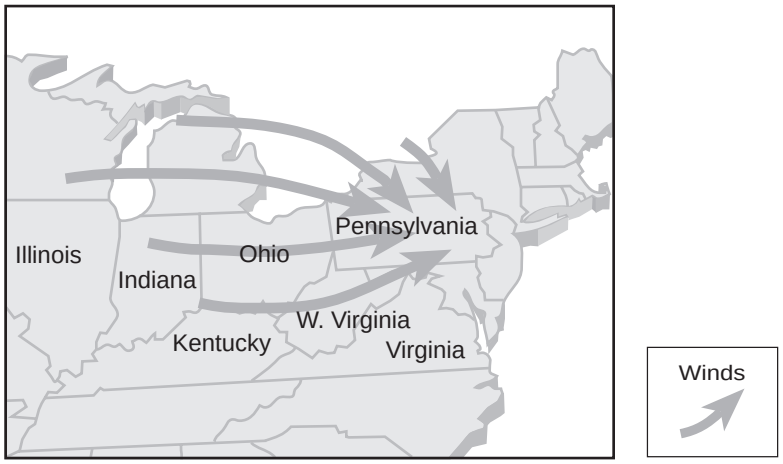


Which row in the chart correctly identifies the functions of structures *A*, *B*, and *C*?

Row	Structure A	Structure B	Structure C
(1)	waste removal	extract energy from nutrients	protein synthesis
(2)	information storage	transport of materials	storage of liquids
(3)	protein synthesis	storage of wastes	reproduction
(4)	cell communication	transport of materials	waste removal

30 The diagram below represents how air pollution may move across the eastern United States.

Movement of Air Pollution



In order to reduce the amount of air pollution in Pennsylvania, which change is necessary?

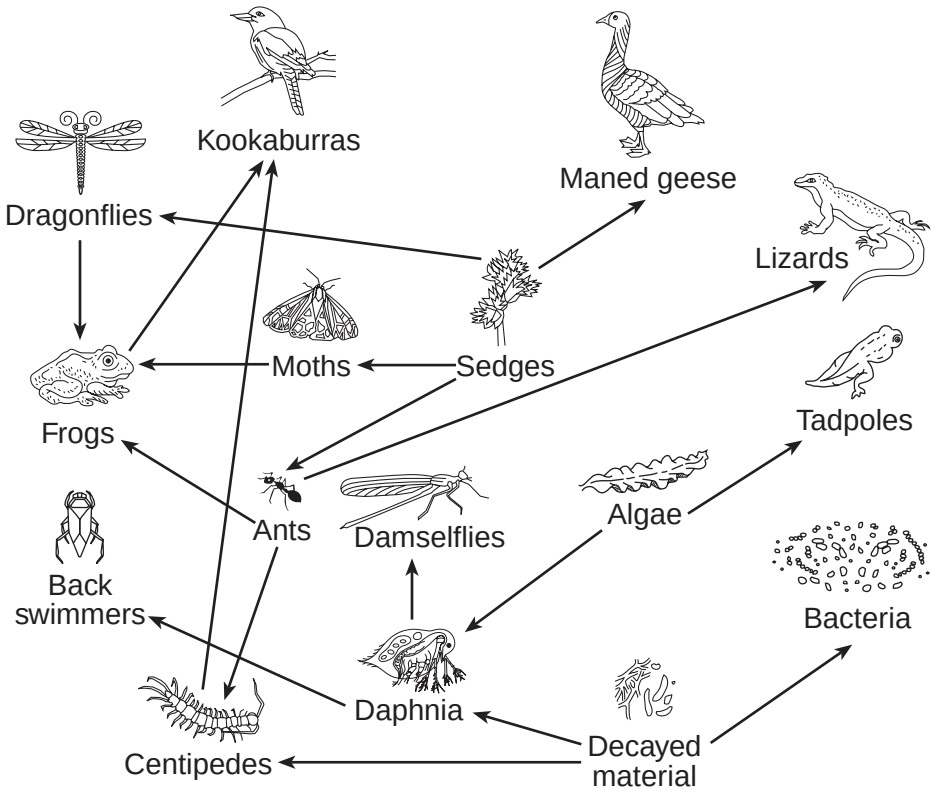
(1) Laws must be passed to protect endangered species.
(2) The use of natural resources must be increased.
(3) More coal-burning power plants must be built.
(4) The cooperation between the different states must be improved.

Part B–1

Answer all questions in this part. [13]

Directions (31–43): For *each* statement or question, record on the separate answer sheet the *number* of the word or expression that, of those given, best completes the statement or answers the question.

Base your answers to questions 31 and 32 on the diagram below and on your knowledge of biology. The diagram represents part of a food web.



31 Which sequence of organisms represents a food chain within this food web?

(1) tadpoles → algae → daphnia → back swimmers
(2) sedges → ants → frogs → kookaburras
(3) algae → daphnia → decayed material → bacteria
(4) dragonflies → sedges → ants →centipedes

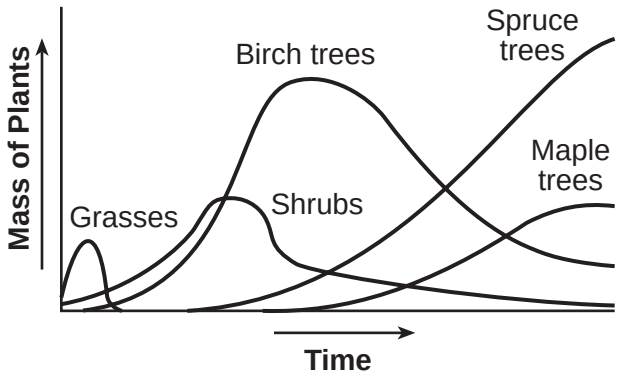
32 Which population would be most immediately affected by the removal of the lizard population?

(1) sedges
(2) algae
(3) ants
(4) centipedes

33 During an investigation, a student measures out 15 grams of salt. Then, he measures 15 milliliters of water and adds the salt to it. Next, he measures a 1 centimeter wide by 4 centimeters long section of plant leaf. Which list of tools is arranged in the order that the student used them?

(1) graduated cylinder, ruler, balance
(2) balance, ruler, graduated cylinder
(3) graduated cylinder, balance, ruler
(4) balance, graduated cylinder, ruler

Base your answers to questions 34 through 36 on the graph below and on your knowledge of biology. The graph shows the masses of different types of plants found in an area of the Adirondack Mountains after a forest fire occurred.



34 Based on the information provided in the graph, the process that is occurring is

(1) ecological succession
(2) biological evolution
(3) selective breeding
(4) genetic engineering

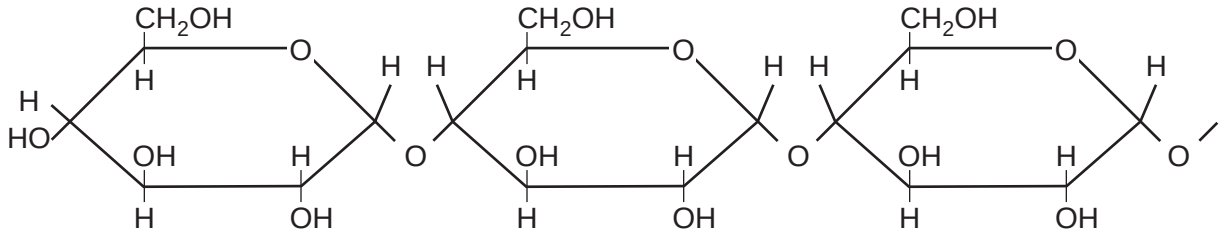
35 The time shown in the graph is most likely measured in

(1) days
(2) weeks
(3) months
(4) years

36 The mass of plants shown in the graph refers to the mass of a number of

(1) populations
(2) decomposers
(3) ecosystems
(4) communities

Base your answers to questions 37 and 38 on the diagram below and on your knowledge of biology. The diagram represents a portion of a starch molecule.



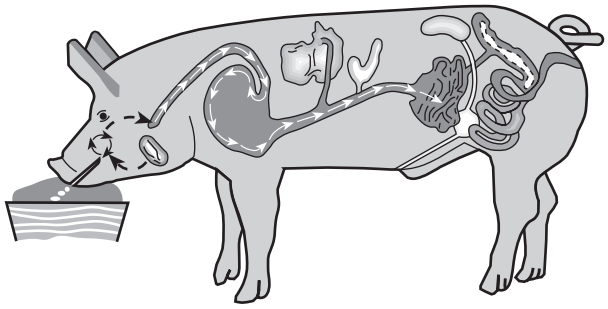
37 The building blocks for this molecule are

(1) amino acids
(2) simple sugars
(3) fats
(4) molecular bases

38 The energy in this molecule is stored

(1) in the bonds between atoms
(2) in the oxygen found in the molecule
(3) when the carbon atoms break off
(4) when water breaks this molecule apart

Base your answer to question 39 on the information below and on your knowledge of biology.



A genetically modified pig, nicknamed the "enviropig," has the ability to produce a bacterial enzyme in its saliva that helps reduce the amount of phosphorus in its wastes. Phosphorus pollution is a serious environmental concern. Enviropigs are expensive, but the cost is balanced against the benefit to the environment. There is also a concern that the US Department of Agriculture still has not cleared enviropig meat for human consumption.

39 Government agencies and citizens should propose the use of enviropig in the future only after

(1) developing ways to remove the bacterial enzyme
(2) assessing risks, costs, and benefits
(3) people have eaten lots of enviropig meat and determined the effects
(4) a different, cheaper pig can be produced regardless of the output of phosphorus

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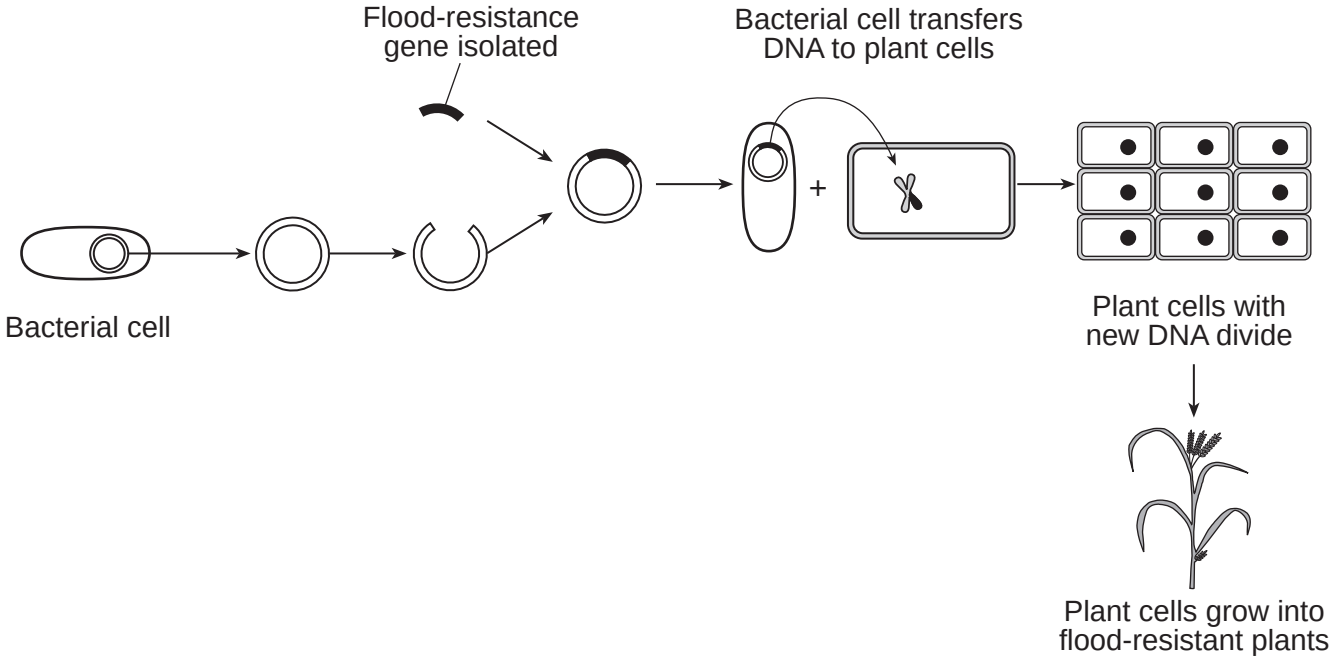
Base your answers to questions 40 and 41 on the information below and on your knowledge of biology.

Researchers have produced rice plants that can withstand being completely submerged for up to two weeks. This is good news for farmers in the flood regions of Southeast Asia. The farmers in this region rely heavily on this crop. The diagram below illustrates the process used to genetically modify plants, such as rice.



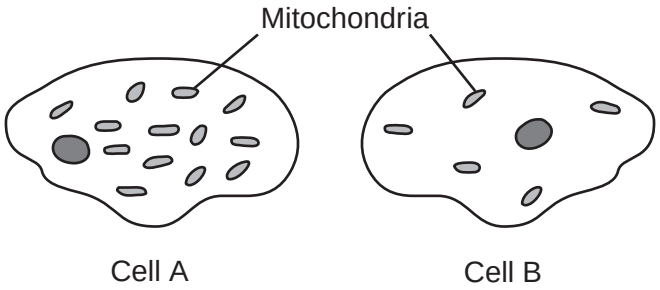
40 The molecules used to cut, copy, and connect the DNA segments used in this process are

(1) sugars
(2) enzymes
(3) indicators
(4) antigens

41 The best explanation for these modified rice plants being flood resistant is that

(1) the gene for flood resistance was inserted into plant cells, which grew into plants whose cells are expressing this gene
(2) they were produced by fertilization, using gametes from two flood-resistant bacterial cells
(3) there was a mutation in the bacterial DNA after it was inserted into the plant that caused it to be flood resistant
(4) the researchers used selective breeding for the flood-resistance trait

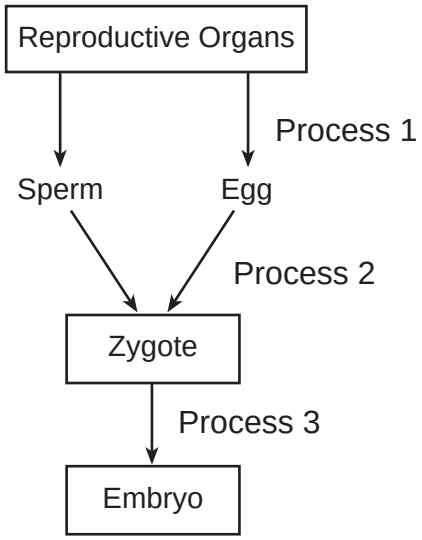
42 The diagram below represents two cells viewed using the same magnification with the same microscope.



One possible conclusion that can be drawn about the activity of these two cells is that

(1) more active transport occurs in cell *B* than in cell *A*
(2) more active transport occurs in cell *A* than in cell *B*
(3) cell *B* uses some of the extra mitochondria to make food
(4) cell *A* is a plant cell since it has a cell wall

43 The diagram below represents the processes leading to the formation of a human embryo.



The correct sequence for processes 1, 2, and 3 represented in the diagram is

Row	Process 1	Process 2	Process 3
(1)	gamete formation	cell division	fertilization
(2)	cell division	gamete formation	fertilization
(3)	gamete formation	fertilization	cell division
(4)	fertilization	gamete formation	cell division

Part B–2

Answer all questions in this part. [12]

Directions (44–55): For those questions that are multiple choice, record on the separate answer sheet the *number* of the choice that, of those given, best completes each statement or answers each question. For all other questions in this part, follow the directions given and record your answers in the spaces provided in this examination booklet.

Base your answers to questions 44 through 47 on the information and data table below and on your knowledge of biology.

For most animals, the sex of the offspring is determined by sex chromosomes. In some species of reptiles, such as the painted turtle, there are no sex chromosomes. It has been discovered that the sex of the offspring is determined by the temperature of the nest in which the egg develops.

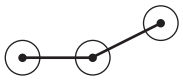
Sex of Painted Turtle Offspring at Various Nest Temperatures

Temperature (°C)	**Sex of Offspring**	
	Males (%)	**Females** (%)
19	0	100
20	5	95
21	20	80
22	25	75
23	0	100
24	0	100
25	0	100

Directions (44–46): Using the information in the data table, construct a line graph on the grid below, following the directions below.

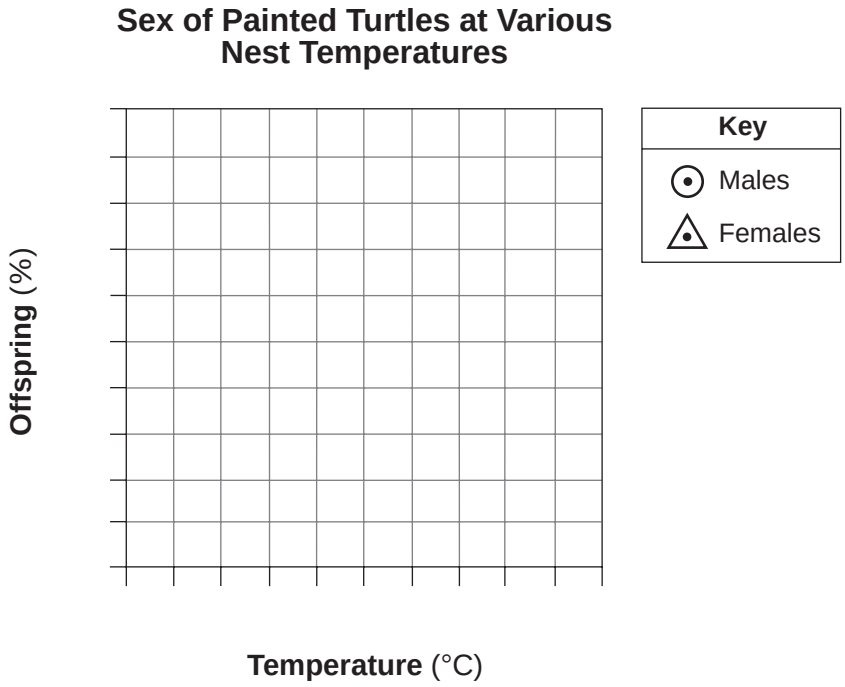
44 Mark an appropriate scale, without any breaks in the data, on each axis. [1]

45 Plot the data for percent males on the grid. Connect the points and surround each point with a small circle. [1]

Example: 

46 Plot the data for percent females on the grid. Connect the points and surround each point with a small triangle. [1]

Example: 



Note: The answer to question 47 should be recorded on your separate answer sheet.

47 The fact that the sex of the painted turtle offspring is controlled by the temperature of the nest is an example of

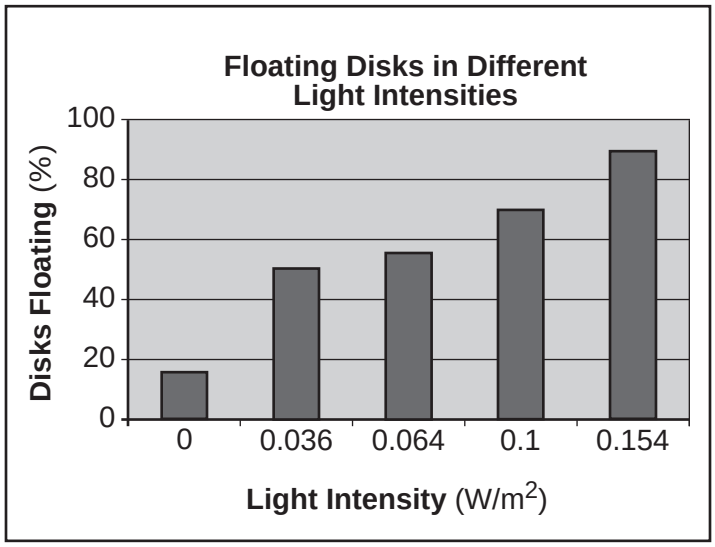
(1) natural selection causing a new species to form
(2) a predator-prey interaction
(3) habitat destruction decreasing biodiversity
(4) environment modifying gene expression

Base your answers to questions 48 through 50 on the information and graphs below and on your knowledge of biology. The graphs represent the results of two investigations using leaf disks from spinach plants.

Small disks were cut from spinach leaves that had been treated to remove any air from inside the leaf. The disks were placed in a solution that allowed them to carry out photosynthesis. At first, all the disks sank to the bottom of the container. These disks were then used for two different investigations.

Investigation 1

The disks were divided into five groups. Each group was exposed to light of a different intensity, measured in watts per meter squared (W/m^2). Some of the disks began to float. The results of the first investigation are shown in the graph below.



48 State the relationship between increasing light intensity and the percentage of disks floating at the conclusion of Investigation 1. [1]

_____

_____

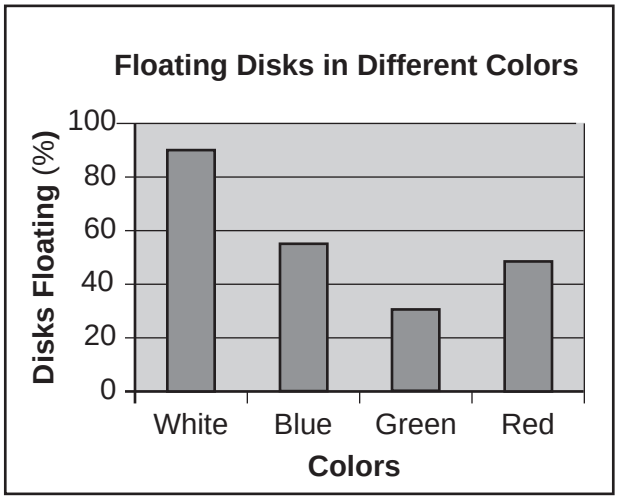
Note: The answer to question 49 should be recorded on your separate answer sheet.

49 The substance produced inside the leaf disks that caused them to float to the surface of the solution is

(1) ozone
(2) oxygen
(3) water
(4) nitrogen

Investigation 2

A number of freshly prepared disks were placed in five containers. These containers were then each exposed to light of a different color. The results of the second investigation are shown in the graph below.



Note: The answer to question 50 should be recorded on your separate answer sheet.

50 Which color of light appears to be *least* effective for photosynthesis in spinach leaves?

(1) white
(2) blue
(3) green
(4) red

Base your answer to question 51 on the information and photograph below and on your knowledge of biology. The photograph shows an oriental hornet.

Oriental hornets are unique insects. A yellow pigment in the body of the insect converts solar energy to electrical energy. Plants also convert energy from the Sun.

51 Identify the organelle present in plants where this conversion takes place. [1]

Base your answer to question 52 on the information below and on your knowledge of biology.

The SUNY Solar Car Model Racing Team's Sunhawk: Car of the Future?

The Sunhawk, a car built by students at SUNY New Paltz, prompted Forbes Magazine to ask "Is The $250,000 Sunhawk the Solar Car of the Future?" These cars show the most advanced solar technology and vehicle construction.

52 There are trade-offs involved in the use of solar-powered cars. Provide *one* advantage and *one* disadvantage of owning a solar car. [1]

Advantage: _____

Disadvantage: _____

Base your answer to question 53 on the information below and on your knowledge of biology.

Ten years ago, scientists discovered a well-preserved set of dinosaur remains in China. This dinosaur, which walked on Earth about 125 million years ago, had feathers and was about the same size as a turkey — but don't be fooled. This dino's bite was a lot worse than a turkey's gobble. After a close (and careful!) examination of the dino's teeth, scientists recently concluded that this dinosaur was probably poisonous. The study was led by David Burnham, who works and teaches at the University of Kansas in Lawrence.

Source: www.sciencenewsforkids.org

53 State *one* inference that could be made based on the fact that this dinosaur had feathers. [1]

_____

_____

Base your answers to questions 54 and 55 on the photograph and information below and on your knowledge of biology.

A captive New Caledonian crow forages for food using a stick tool. (Credit: Dr. Simon Walker)

A Great Larvae Meal

New Caledonian crows consume a wide range of foods. These crows require tools to extract the larvae of wood boring beetles from their burrows. A bird pokes a larva with a stick until the larva is disturbed enough to bite the stick and hang on to it. The bird is then able to pull the larva out of its burrow. These larvae, with their unusual diet, have a distinct chemical that can be found in the feathers and blood of crows—allowing scientists to determine the percentage of the crows' diet that is made up of beetle larvae. Scientists found that the beetle larvae are so energy-rich that just a few could satisfy the daily energy requirement for a crow. The crows with the greatest skill in using a twig as a tool benefit most in terms of nutrition.

54 State *one* reason why the offspring of crows skilled at using twigs as tools would have the greatest chance of survival. [1]

55 State *one* reason why some members of a population of crows equally skilled in the use of twigs have different rates of survival. [1]

Part C

Answer all questions in this part. [17]

Directions (56–72): Record your answers in the spaces provided in this examination booklet.

Base your answer to question 56–57 on the information below and on your knowledge of biology.

African violet plants are grown for their delicate, colorful flowers and furry, soft leaves. People often want to touch the leaves and brush the hairy leaves with their fingers. Growers and plant owners were concerned that this could negatively affect the plant. Of particular concern was the presence of body lotion or other skin products on the hands of persons touching the leaves.

A student thought this might be the basis of a science project. He selected two African violet plants. Ten leaves on each of the two plants were brushed with a gloved hand for 30 seconds, once a day, for a period of five days. The difference was that leaves of the second plant were brushed with a gloved hand that had hand lotion applied to the glove.

56–57 As part of the peer review process, evaluate the student's experiment. As part of your evaluation, be sure to:

- state *one* possible hypothesis for the experiment proposed by the student [1]
- describe the type of data that should be collected to determine if the brushing with lotion was having a *negative* effect on the African violet plant [1]

Base your answers to questions 58 and 59 on the information and chart below and on your knowledge of biology.

Scientists studied the distribution of a species of pocket mouse that lived in the sandy desert regions of the southwestern United States. They are eaten by a variety of predators. Pocket mice are active at night, and feed on seeds and grasses. A single female mouse can reproduce several times each year, producing a litter of 3 to 13 offspring each time. Each new litter is considered a generation.

A volcanic eruption that resulted in lava flows changed the color of the area that the mice inhabit from light brown to black. Data from the scientist's research of the population are shown in the chart below.

Changes in Pocket Mouse Fur Color after a Volcanic Eruption

Number of Generations	Percentage of Pocket Mice with Light Brown Fur	Percentage of Pocket Mice with Black Fur
10	95%	5%
25	90%	10%
50	75%	25%
100	5%	95%

58 State the role of mutation *or* recombination in the appearance of the trait for black fur color in the pocket mouse population. [1]

59 Explain why the percentage of black pocket mice changed so much after the volcanic eruption. [1]

Base your answers to questions 60 and 61 on the information below and on your knowledge of biology.

In 2003, as a result of the Human Genome Project, the complete sequence of all the bases in human DNA was released to the public. Although knowing the entire sequence of bases has proven valuable, scientists are currently working to map genes. Mapping genes involves determining the exact location of each gene. Since much of human DNA does not code for a protein, it is challenging to figure out which segments are actual genes. Often, scientists look at the percent composition of bases in a segment of DNA. If the segment of DNA has a large percentage of C and G bases (together over 50%), it is likely that it is a gene and codes for a protein.

60 A scientist analyzes the bases in a segment of DNA from a human skin cell to determine if it codes for a protein. The base *A* is 12% of the bases in this segment of DNA. Calculate the percentage of bases that would be *C*. [1]

_____ **%**

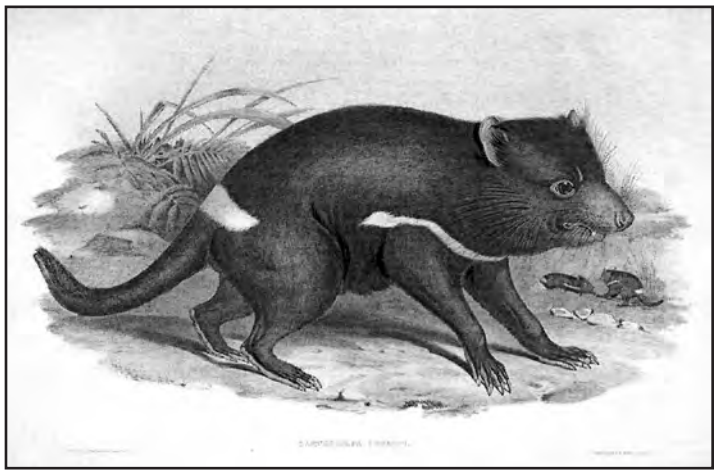
61 Is it likely this segment of DNA codes for a protein? Circle yes *or* no and support your answer. [1]

Circle one: Yes *or* No

_____

_____

Base your answers to questions 62 through 64 on the illustration and information below and on your knowledge of biology. The illustration is of a Tasmanian devil.



Source: http://www.statelibrary.tas.gov.au

The Tasmanian devil is the largest surviving carnivorous marsupial in Australia. It is in danger of extinction due to an unusual type of cancer called Devil Facial Tumor Disease (DFTD). It can be passed from one individual to another through wounds that occur when they fight over food. Tumor cells in the mouth of an infected animal break off and enter the wound on an uninfected animal. The tumor cells multiply in the body of the newly infected devil, forming new tumors that eventually kill the animal.

Recent research has shown that the immune system of a Tasmanian devil accepts tumor cells from another devil as if they were cells from its own body. The tumor cells are ignored by the immune system. No immune response develops against them, and the cancerous cells multiply. Scientists predict that DFTD could wipe out all the remaining Tasmanian devils in 25 years, unless a treatment is developed.

62 Using the terms antigens and antibodies, explain why the tumor cells are ignored by the immune system in Tasmanian devils. [1]

63 Explain how cancer cells differ from normal cells. [1]

64 Describe *one* possible way to maintain a population of healthy, uninfected Tasmanian devils until a treatment or cure can be found. [1]

Base your answers to questions 65 through 67 on the information below and on your knowledge of biology. The photograph below shows a Canada lynx, a mammal native to North America.

Source: http://www.allposters.com

Lynx are found in areas where there is deep, soft snow cover during the winter months. The body design of the Canada lynx helps keep the animal on top of the soft snow. Several unique characteristics, such as the design of its feet and its weight, enable the cat to successfully chase and catch snowshoe hares, its primary source of food. Snowshoe hares are also able to remain on top of the snow.

Increased winter recreation has created packed snow trails in lynx habitat. This allows coyotes and cougars to compete with lynx.

65 Explain why coyotes were *not* in competition with the lynx prior to the presence of packed snow trails. [1]

66 Describe the niche that the lynx, coyote, and cougar are competing to fill. [1]

67 Explain how the carrying capacity affects the number of predators in an area. [1]

Base your answers to questions 68 and 69 on the information below and on your knowledge of biology.

Cowherds Discovering Ticks Are for the Birds

South African cowherds [cowboys] are discovering that when it comes to debugging their cattle, nature knows best. Generations of cattle owners who dipped their livestock in pesticides ended up killing not only the ticks that feast on them, but also the red-billed oxpeckers [birds] that eat the ticks. Now environmentalists want to cut out the pesticides, hand the job back to the birds and in the process save them from extinction.…

The bird is famous for its bright red bill, yellow ringed eyes and voracious appetite for ticks. An oxpecker can eat 13,000 of them [ticks] in a day, and meals are everywhere—on antelope, horses, cattle, buffalo, rhino, lion, elephant and leopard. The ticks carry a host of illnesses, including red-water disease, a common killer of cattle, but [ticks] are harmless to oxpeckers.…

Source: Eric Naki, Associated Press writer

68 State *one* way that the use of pesticides to kill ticks could lead to the decline of the oxpecker population. [1]

_____

_____

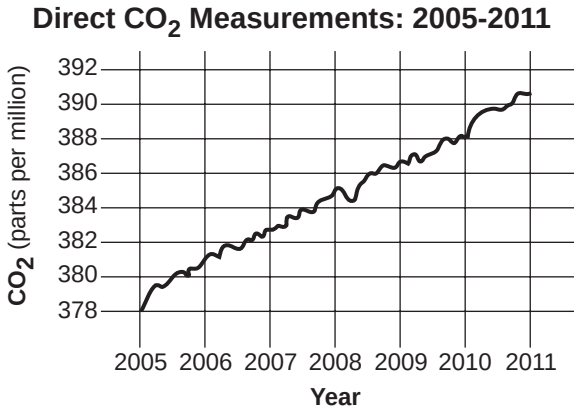
69 State *one* ecological advantage of using oxpeckers to solve the problem with these ticks. [1]

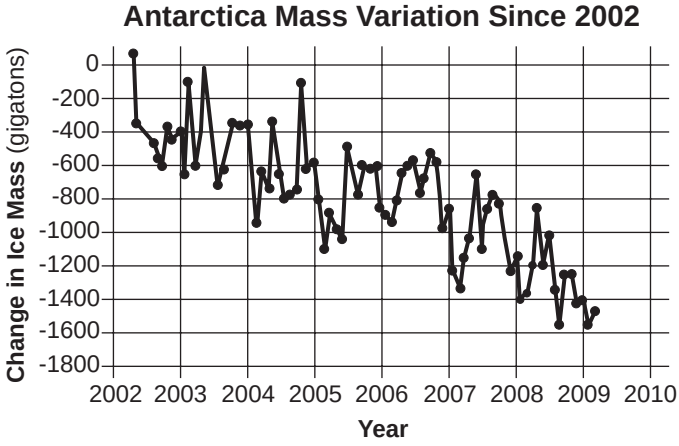
_____

_____

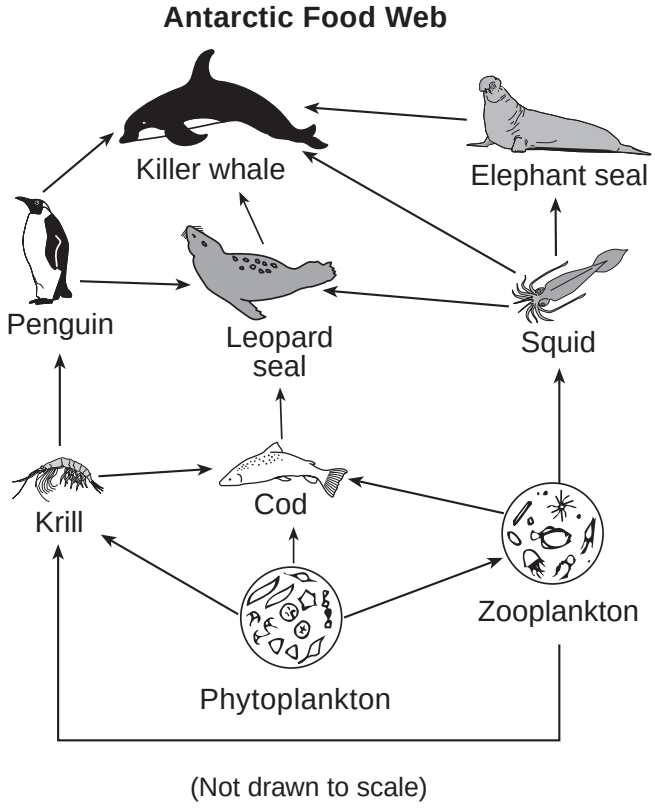
Base your answers to questions 70 through 72 on the information below and on your knowledge of biology.

Over the past few decades, researchers have observed declining numbers in two species of penguins native to the West Antarctic peninsula. New evidence is pointing to a decline in their food supply as the primary cause for the recent drops in their numbers. These penguins feed on krill, small animals that grow and develop under ice masses. The graphs below show data related to two factors: atmospheric carbon dioxide (CO_2) levels and Antarctic ice mass. The diagram of a generalized Antarctic food web illustrates the role of the penguins.





Source: http://www.nasa.gov



(Not drawn to scale)

Source: School Improvement in Maryland, www.mdk12.org

70 State *one* possible relationship between CO_2 levels and the change in Antarctic ice mass. [1]

71 Explain why the change in ice mass is resulting in a decline in the penguin populations. [1]

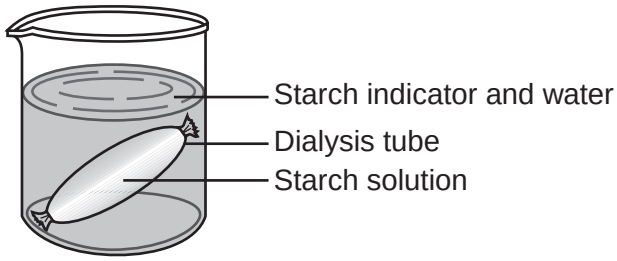
72 State *one* specific way in which humans might have caused the changes in atmospheric CO_2 levels. [1]

Part D

Answer all questions in this part. [13]

Directions (73–85): For those questions that are multiple choice, record on the separate answer sheet the *number* of the choice that, of those given, best completes the statement or answers the question. For all other questions in this part, follow the directions given and record your answers in the spaces provided in this examination booklet.

Base your answers to questions 73 through 75 on the diagram below and on your knowledge of biology. The diagram represents an experimental setup.



Note: The answer to question 73 should be recorded on your separate answer sheet.

73 Which statement best describes what would most likely be observed after 20 minutes?

(1) The contents of the dialysis tube would turn blue-black.
(2) The liquid in the beaker would turn blue-black.
(3) The dialysis tube would burst.
(4) There would be no change visible.

Note: The answer to question 74 should be recorded on your separate answer sheet.

74 Which term correctly identifies the process by which molecules move through the dialysis tube membrane?

(1) paper chromatography
(2) active transport
(3) diffusion
(4) digestion

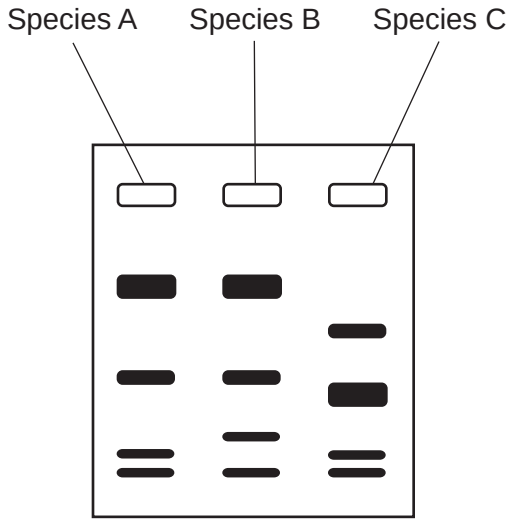
Note: The answer to question 75 should be recorded on your separate answer sheet.

75 A student filled a dialysis tube with 97% water solution and sealed the ends. The tube and its contents had a mass of 55 grams. The student placed the tube in a solution, and the mass of the tube and its contents increased to 60 grams. Into which solution was the dialysis tube placed?

(1) 0% water
(2) 95% water
(3) 97% water
(4) 99% water

Base your answers to questions 76 and 77 on the information and diagram below and on your knowledge of biology.

Scientists attempted to determine the evolutionary relationships between three different finch species, *A*, *B*, and *C*. In order to do this, they examined the physical characteristics and DNA of these species. DNA was extracted from all three species and analyzed using gel electrophoresis. The results are shown in the diagram.

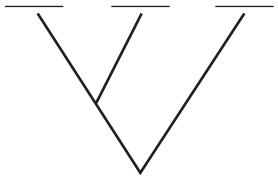


Note: The answer to question 76 should be recorded on your separate answer sheet.

76 Which statement best describes the method used above to determine the evolutionary relationships between three species of finches?

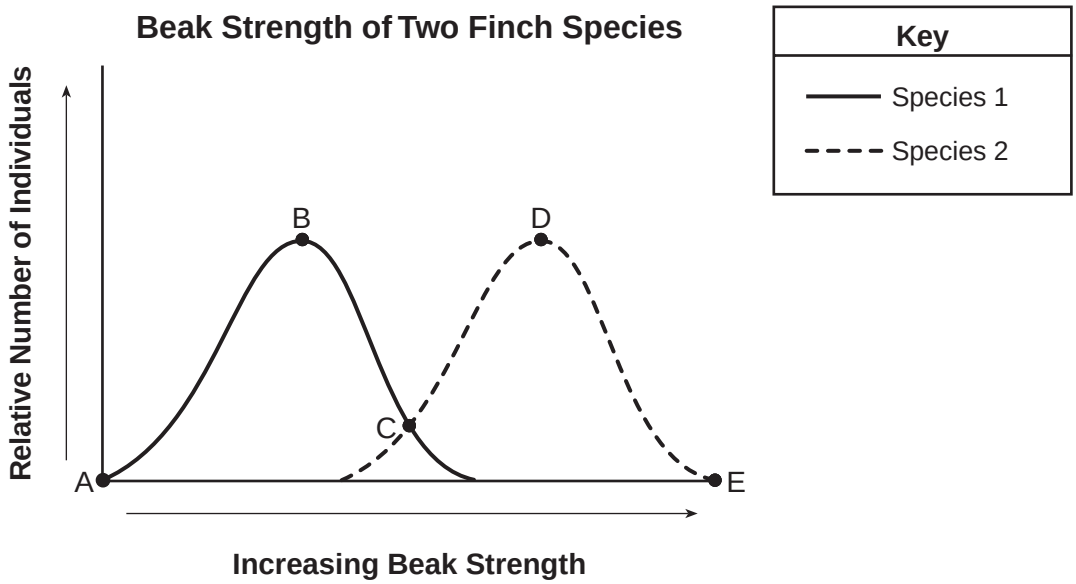
(1) Examine the structure of the beaks and compare them.
(2) Observe behavioral and physical characteristics of all the finches and group them by similarities.
(3) Obtain molecular evidence from all three species and identify similarities.
(4) Compare common ancestors of all three of the species to see if they are the same.

77 Based on the data they collected using gel electrophoresis, label the branching tree diagram below. Write the letters *A*, *B*, and *C*, to represent the possible evolutionary relationships between species *A*, *B*, and *C*. [1]



Base your answers to questions 78 through 80 on the information and diagram below and on your knowledge of biology.

Two species of finches found on a particular Galapagos island eat the seeds of a certain variety of plant. The relative strength of their beaks is shown in the graph below.



78 One of the finch species has a slightly smaller, weaker beak. Is this species 1 or species 2? Support your answer with information from the graph. [1]

Species: _____

_____

_____

79 Select the point on the graph where beak strength of the two bird species is equal. Support your answer. [1]

Point: _____

_____

_____

80 If the environment on the island changed and the seeds of more of the plants became harder to crack open, describe what the graph might look like after many years have passed. [1]

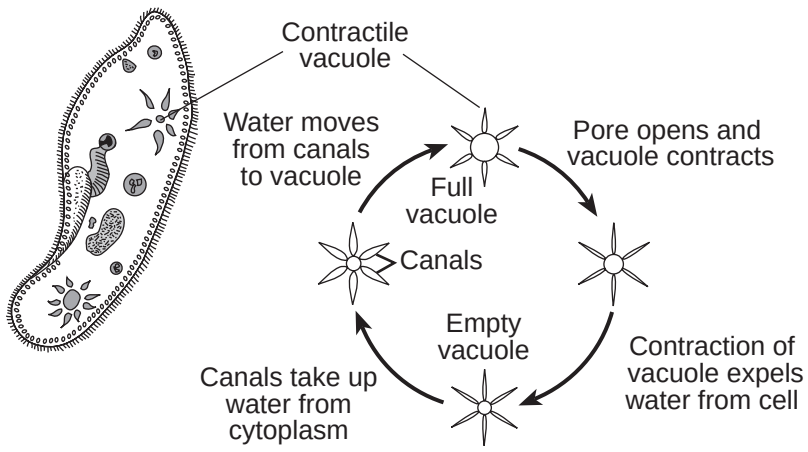
_____

_____

Base your answers to questions 81 and 82 on the information and diagram below and on your knowledge of biology.

Using a microscope and a wet-mount slide, a student observed a pond water sample containing paramecia, which are single-celled freshwater organisms. He noticed that there was a structure within each living paramecium that contracted regularly—about four times each minute. He researched the organism in his science textbook and found that the structure was a contractile vacuole and its function was to remove excess water from the paramecium.

In the diagram below, a paramecium is represented as seen through a microscope. The function of the contractile vacuole is described.



He decided to determine if the concentration of salt in the environment of the paramecium would affect the rate at which the contractile vacuole would contract.

Note: The answer to question 81 should be recorded on your separate answer sheet.

81 The process used to remove excess water from the paramecium by the contractile vacuole is

(1) synthesis
(2) digestion
(3) active transport
(4) passive transport

Note: The answer to question 82 should be recorded on your separate answer sheet.

82 The student predicted that the contractile vacuole would contract fewer times in one minute in a solution that had a higher concentration of salt than that found in typical pond water. This prediction is most likely

(1) correct, because a high concentration of salt in the environment will force water into the cell, causing the contractile vacuole to pump
(2) incorrect, because salt would be entering the cell, and the contractile vacuole would have to pump it out
(3) incorrect, because the concentration of salt in the environment should not affect a cell
(4) correct, because water would be moving out of the cell into the salt solution

Base your answers to questions 83 through 85 on the information below and on your knowledge of biology.

Five individuals had their pulses taken in beats per minute (bpm) before and after exercise. The data are shown in the chart below.

Pulse Rates

Individual	**Pulse before Exercise** (bpm)	**Pulse after Exercise** (bpm)
A	68	100
B	70	120
C	54	130
D	64	122
E	75	115

83 State *one* reason why an individual's pulse rate increased during exercise. [1]

_____

_____

84 Calculate the average pulse rate *before* exercise for this group, to the *nearest tenth*. [1]

_____ **bpm**

85 State why the individuals in this group have different pulse rates before exercise. [1]

_____

_____

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LIVING ENVIRONMENT

FOR TEACHERS ONLY

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

LIVING ENVIRONMENT

Wednesday, June 15, 2016 — 9:15 a.m. to 12:15 p.m., only

SCORING KEY AND 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.

Multiple Choice for Parts A, B–1, B–2, and D
Allow 1 credit for each correct response.

Part A

1 ..... **2**	9 ..... **1**	17 ..... **4**	25 ..... **1** .....
2 ..... **4**	10 ..... **1**	18 ..... **4**	26 ..... **4** .....
3 ..... **2**	11 ..... **2**	19 ..... **3**	27 ..... **2** .....
4 ..... **3**	12 ..... **2**	20 ..... **3**	28 ..... **4** .....
5 ..... **3**	13 ..... **2**	21 ..... **4**	29 ..... **1** .....
6 ..... **2**	14 ..... **1**	22 ..... **1**	30 ..... **4** .....
7 ..... **2**	15 ..... **4**	23 ..... **1**	
8 ..... **4**	16 ..... **3**	24 ..... **4**	

Part B–1

31 ..... **2**	35 ..... **4**	39 ..... **2**	43 ..... **3** .....
32 ..... **3**	36 ..... **1**	40 ..... **2**	
33 ..... **4**	37 ..... **2**	41 ..... **1**	
34 ..... **1**	38 ..... **1**	42 ..... **2**	

Part B–2

47 ..... **4**	49 ..... **2**	50 ..... **3** .....

Part D

73 ..... **1**	75 ..... **4**	81 ..... **3** .....
74 ..... **3**	76 ..... **3**	82 ..... **4** .....

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Living Environment. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences.*

Do not attempt to correct the student's work by making insertions or changes of any kind. If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the Part B–2, Part C, and Part D 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 Scoring Key and 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. 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 box labeled "Total Raw Score." Then the student's raw score 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 Wednesday, June 15, 2016. 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.

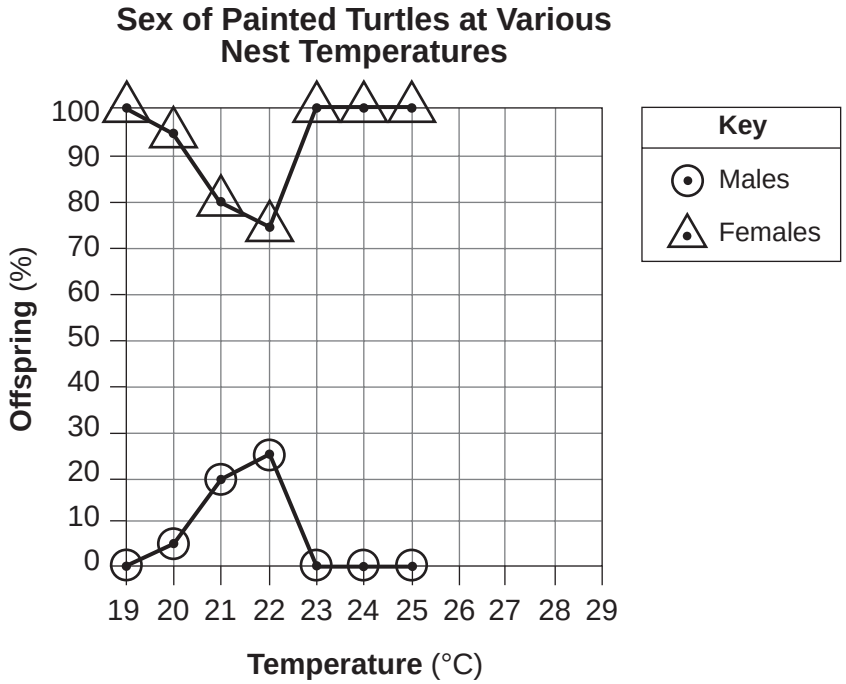
Part B–2

44 [1] Allow 1 credit for an appropriate scale, without any breaks in the data, on both axes.

45 [1] Allow 1 credit for correctly plotting the data for percent males, connecting the points and surrounding each point with a small circle.

46 [1] Allow 1 credit for correctly plotting the data for percent females, connecting the points and surrounding each point with a small triangle.

Example of a 3-credit graph for questions 44–46:



Note: Allow credit only if circles and triangles are used.

Do *not* assume that the intersection of the *x*- and *y*-axes is the origin (0,0), unless it is labeled. An appropriate scale only needs to include the data range in the data table.

Do *not* allow credit if points are plotted that are not in the data table, e.g., (0,0), or for extending lines beyond the data points.

Do *not* deduct more than 1 credit for plotting points that are not in the data table or for extending lines beyond the data points.

47 MC on scoring key

48 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— With more intense light, a higher percentage of the disks floated.

— More light intensity equals more disks floating.

— As light intensity increases, the percentage of floating disks increases.

49 MC on scoring key

50 MC on scoring key

51 [1] Allow 1 credit for chloroplast.

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

Advantages:

— Solar energy is a renewable resource.

— no air pollution from solar vehicle

— burning less oil/coal/natural gas

— using less gasoline

Disadvantages:

— cost

— cannot charge at night

— cannot use year-round in some areas

— may not be able to drive at night

53 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The dinosaur could fly.

— Dinosaurs are the ancestors of/related to birds.

— Some types of dinosaurs evolved into birds.

54 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Well-fed parents will probably have well-fed and stronger offspring.

— They will have more food.

— They will likely be good twig users.

55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— There is a chance that some other variation will also affect some of the crows' ability to survive.

— The tool may not be useful in their environment.

— There are many other factors that influence survival (e.g., vision, size, muscle strength).

Part C

Note: The student's response to the bulleted items in question 56–57 need *not* appear in the following order.

56 [1] Allow 1 credit for stating *one* possible hypothesis for the experiment proposed by the student. Acceptable responses include, but are not limited to:

— The presence of lotion on the leaves will slow the growth of the plants.

— If the leaves of an African violet plant are rubbed with body lotion, growth will be reduced.

— Lotion brushed on the leaves of an African violet plant will have no effect on the leaves.

— Lotion on the leaves has a negative effect on plants.

Note: Do *not* allow credit for a hypothesis written in the form of a question.

57 [1] Allow 1 credit for describing the type of data that should be collected to determine if brushing with lotion was having a *negative* effect on the African violet plant. Acceptable responses include, but are not limited to:

— the number of leaves that wilted during the five-day period

— the growth of each plant measured in centimeters

— the number of leaves that dropped off/turned yellow

— size of area of damage on leaves

— the number of damaged leaves

— change in size of the leaves brushed on each plant

Note: The type of data must be measurable.

58 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— A mutation resulted in the initial color change.

— Recombination provides genetic variability for fur color in offspring.

59 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The black pocket mice blended in with their surroundings better, and more were able to survive and reproduce.

— After the color change in the environment, the black mice were more difficult for predators to see.

— The black mice are harder to see at night.

60 [1] Allow 1 credit for 38%.

61 [1] Allow 1 credit for circling yes and supporting the answer. Acceptable responses include, but are not limited to:

— because there are high percentages of C and G bases

— because the percent of C and G is over 50%

— because the segment of DNA is most likely a gene

Note: Allow credit for a response that is consistent with the student's response to question 60.

62 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The tumor cells might lack antigens that the antibodies can recognize and attack.

— The antigens on the surface of the tumor cells could be interpreted by the immune system as being on cells that are not harmful and therefore do not form antibodies to attack them.

— The cancer cells might not have any antigens on their surfaces. Without antigens, antibodies will not attack.

Note: Do *not* allow credit if the student does not answer the question using the terms antigens and antibodies.

63 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Cancer cells undergo uncontrolled cell division.

— Cancer cells have more mutations.

— Cancer cells are more harmful and disrupt homeostatis.

64 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Move some uninfected animals to an area where they will not come into contact with infected animals.

— Remove baby devils from the population and place them in a zoo or wildlife refuge.

— Separate the animals while they are feeding.

— Provide more food to decrease competition/fighting.

65 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The lynx is adapted to stay on top of the snow, while coyotes are not.

— Coyotes could not prey on animals in the same area as the lynx.

— Coyotes lack the foot design of the lynx, and could not chase hares where the snow is soft and deep.

— Coyotes could not walk in the deep, soft snow.

66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The niche is to feed on snowshoe hares in a snowy environment.

— The niche includes being a predator in an environment that has snow during the winter.

— They're all predators/carnivores.

67 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Carrying capacity limits the number of organisms that can live in an area. There are only so many hares, so there can be only so many predators of hares.

— There is a limited number of prey animals. These determine the carrying capacity of the area and can support only a certain number of predators.

— The carrying capacity of the predators is directly related to the size of the hare population.

68 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The ticks could become toxic and the oxpeckers that eat them get sick and die.

— Pesticides could kill the birds.

— The ticks were the food source for the birds.

— Without ticks for food, the bird population would die off.

— biomagnification

69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Each oxpecker can eat 13,000 ticks in a day, reducing the parasite population.

— No harmful chemicals are used.

— Biodiversity is increased.

— The birds will have food to eat.

— It will save the oxpeckers from extinction.

Note: Do *not* allow credit for stating that it is "natural" without an explanation.

70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— An increase in CO_2 levels caused the ice to melt.

— An increase in CO_2 brought about global warming, which melted the ice.

— As the level of CO_2 increased, ice mass decreased.

— As CO_2 increased, the temperature increased, and the ice mass decreased.

71 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The penguins' food source grows and develops under the ice masses.

— less ice, fewer krill for the penguins to eat

— loss of habitat for the penguins

72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Humans' burning of fossil fuels is increasing CO_2 levels.

— Increased industrialization is releasing more CO_2 into the atmosphere.

— deforestation

— driving cars

Note: Do *not* allow credit for just pollution.

Part D

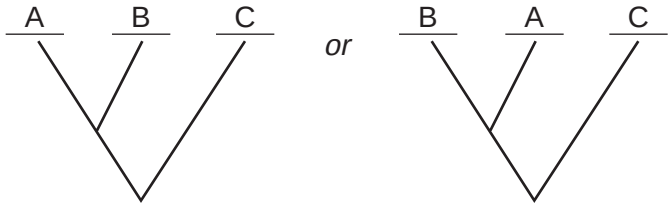
73 MC on scoring key

74 MC on scoring key

75 MC on scoring key

76 MC on scoring key

77 [1] Allow 1 credit for completing the diagram as follows:



78 [1] Allow 1 credit for 1 and supporting the answer. Acceptable responses include, but are not limited to:

— They have the weaker beak because the majority of the population is at the low end of the graph.

— because it has a weaker beak than species 2, except where the two lines overlap

— More of species 1 finches are at the low-strength end of the graph.

79 [1] Allow 1 credit for *C* and supporting the answer. Acceptable responses include, but are not limited to:

— At point *C*, the beak strength has the same value for both species.

— because that is where the lines intersect

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

— The curve for species 1 may be lower and shorter.

— The curve for species 1 may be eliminated.

— Both curves might show an increase in beak strength.

— There would be more individuals in species 2 than in species 1.

— The curve for species 1 would shift to the right.

81 MC on scoring key

82 MC on scoring key

83 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— More nutrients are used when muscle cells are more active.

— Muscle cells use more oxygen.

— to help maintain homeostasis

— A faster pulse rate will remove waste more rapidly.

84 [1] Allow 1 credit for 66.2.

85 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— different activities they did before pulse was taken

— Some may be in better shape.

— Some may take medication.

— individual variations

— They were less active before they exercised.

The *Chart for Determining the Final Examination Score for the June 2016 Regents Examination in Living Environment* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Wednesday, June 15, 2016. Conversion charts provided for previous administrations of the Regents Examination in Living Environment 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.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm.
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

June 2016 Living Environment

Standards	Question Numbers			
	Part A 1–30	**Part B–1 31–43**	**Part B–2 44–55**	**Part C 56–72**
Standard 1 — Analysis, Inquiry and Design				
Key Idea 1			49, 50	
Key Idea 2				
Key Idea 3			44, 45, 46, 48, 53	
Appendix A (Laboratory Checklist)		33		56, 57
Standard 4				
Key Idea 1	1, 3, 5, 6, 8, 11, 29	31, 32, 36, 42		
Key Idea 2	7, 10, 19	40, 41	47	60, 61
Key Idea 3	9, 14, 16, 17		54, 55	58, 59
Key Idea 4	4, 12, 15, 18, 26	43		
Key Idea 5	13, 20, 21, 23, 28	37, 38	51	62, 63, 64
Key Idea 6	22, 25	34, 35		65, 66, 67, 68, 69
Key Idea 7	2, 24, 27, 30	39	52	70, 71, 72

Part D 73–85	
Lab 1	76, 77
Lab 2	83, 84, 85
Lab 3	78, 79, 80, 81, 82
Lab 5	73, 74, 75

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Office of State Assessment
Albany, New York 12234

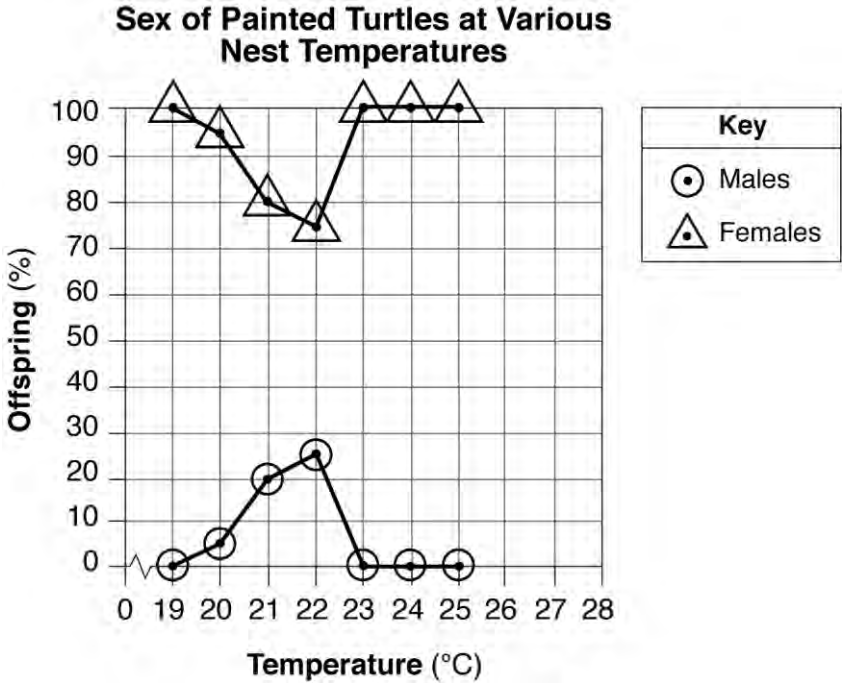
SCORING CLARIFICATION

Notice to Teachers

Regents Examination in Living Environment
Wednesday, June 15, 2016, 9:15 a.m.
Question 44

Please use the information below in addition to that provided in the rating guide to score responses to Question 44.

The response does *not* have to start the scale at zero. Do *not* assume that the intersection of the *x*- and *y*-axes is the origin (0,0), unless it is labeled. If in the response, the *x*-axis starts at 0, a break in the scale is acceptable as long as that break is clearly marked between 0 and 19, as illustrated below.



Please verify that all students' responses to Questions 44 have been scored in accordance with the above clarification.

Please photocopy this notice and give a copy of it to each teacher scoring the Regents Examination in Living Environment.

We apologize for any inconvenience this may cause you, and we thank you for your hard work on behalf of the students in New York State.

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

Regents Examination in Living Environment – June 2016

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

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

Raw Score	Scale Score
56	**77**
55	**77**
54	**76**
53	**75**
52	**75**
51	**74**
50	**73**
49	**72**
48	**71**
47	**71**
46	**70**
45	**69**
44	**68**
43	**67**
42	**66**
41	**66**
40	**65**
39	**64**
38	**63**
37	**62**
36	**61**
35	**59**
34	**58**
33	**57**
32	**56**
31	**55**
30	**54**
29	**52**
28	**51**

Raw Score	Scale Score
27	**50**
26	**49**
25	**47**
24	**46**
23	**44**
22	**43**
21	**42**
20	**40**
19	**39**
18	**37**
17	**35**
16	**34**
15	**32**
14	**30**
13	**28**
12	**27**
11	**25**
10	**23**
9	**21**
8	**19**
7	**17**
6	**14**
5	**12**
4	**10**
3	**8**
2	**5**
1	**3**
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 Living Environment.