FOR TEACHERS ONLY

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

LIVING ENVIRONMENT

Thursday, August 17, 2017 — 12:30 to 3:30 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 ..... **1**	25 ..... **4** .....
2 ..... **3**	10 ..... **2**	18 ..... **1**	26 ..... **2** .....
3 ..... **3**	11 ..... **3**	19 ..... **3**	27 ..... **2** .....
4 ..... **4**	12 ..... **4**	20 ..... **3**	28 ..... **1** .....
5 ..... **2**	13 ..... **1**	21 ..... **3**	29 ..... **2** .....
6 ..... **2**	14 ..... **2**	22 ..... **1**	30 ..... **4** .....
7 ..... **4**	15 ..... **4**	23 ..... **1**	
8 ..... **3**	16 ..... **3**	24 ..... **1**	

Part B–1

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

Part B–2

47 ..... **3**	49 ..... **1**	50 ..... **2** .....

Part D

73 ..... **3**	75 ..... **2**	81 ..... **2** .....
74 ..... **4**	76 ..... **4**	82 ..... **1** .....

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 Thursday, August 17, 2017. 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.

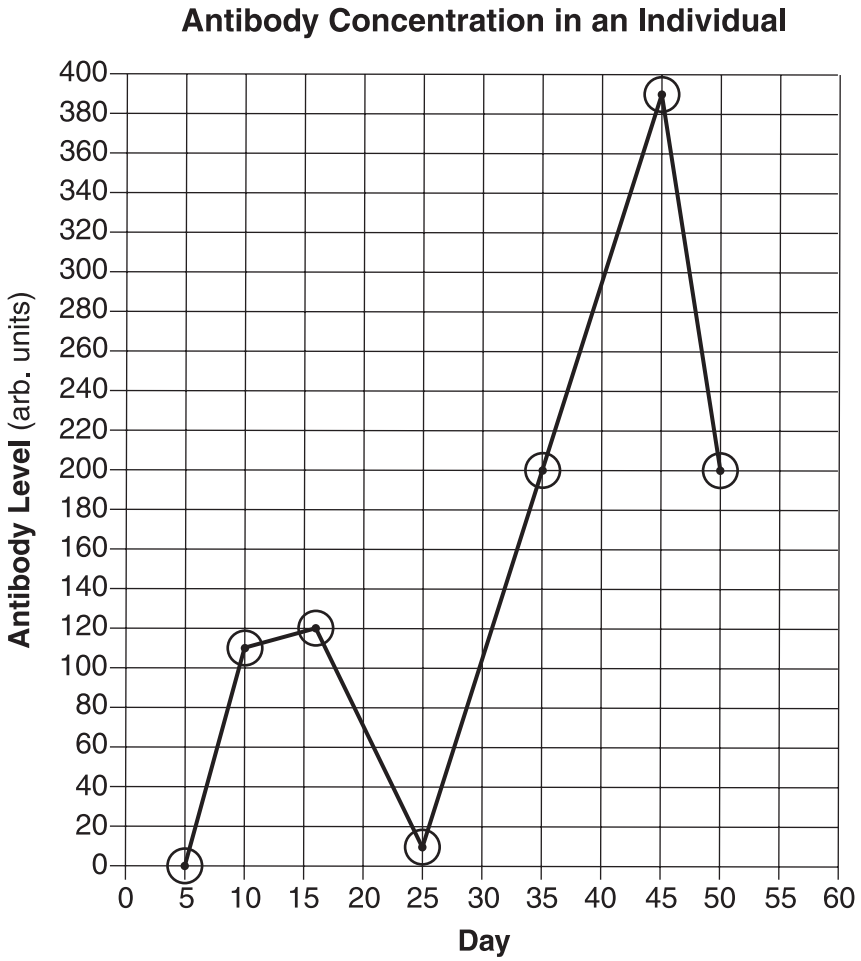
Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Part B–2

44 [1] Allow 1 credit for marking an appropriate scale, without any breaks in the data, on each labeled axis.

45 [1] Allow 1 credit for correctly plotting the data and connecting the points.

Example of a 2-credit graph for questions 44–45:



Note: Allow credit if the points are correctly plotted, but not circled.

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.

46 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The individual was exposed to a disease.

— The individual received a vaccination.

— The individual got sick.

— exposure to antigens

— immune response

— More white blood cells were produced.

47 MC on scoring key

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

— breeding two dogs with long hair to produce long-haired puppies

— selective breeding

— cloning/genetic engineering

49 MC on scoring key

50 MC on scoring key

51 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The plants have desirable traits. This technique is a way to be sure all the offspring will have these traits.

— to maintain a plant that has increased nutritional value

— to maintain a plant that grows larger or faster

— to produce more of a plant that is resistant to diseases or pesticides

— to prevent extinction

— to maintain biodiversity

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

— Certain levels of miR-7 expression can also stimulate the development of cancer cells.

— miR-7 can activate/turn on some cancer genes.

— miR-7 can cause the formation of cancer cells.

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

— They can metastasize to other organs.

— Cancer cells keep dividing.

— Cancer cells can be larger/shaped differently than normal cells.

— Some have more than one nucleus.

— Cancer cell division is uncontrolled.

— They have more mutations.

— The cancer cells are deformed.

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

— All of the cells contain organelles.

— All have a cell membrane/nucleus/cytoplasm/mitochondria.

— They carry out life processes/respiration/mitosis.

— They all use ATP/glucose.

Note: Do *not* accept answers that simply say they are body cells, since that information is given.

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

— This allows these cells to be specialized for a specific function.

— Differences in cells are related to different functions in the body.

Part C

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

— They are eating the same food as the spotted owls, not leaving enough for the spotted owls.

— It is outcompeting the spotted owl for the same niche.

— The two species are competing for the same resources, and the barred owl is more successful.

— The barred owl is bigger and more aggressive, and is taking over the habitat.

— Barred owls now cover the spotted owls' range, outnumbering them in some places.

57 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Extinction represents the loss of genetic material and reduces the biodiversity of this ecosystem.

— Biodiversity tends to keep the ecosystem stable.

— Once the spotted owls are extinct, they cannot be brought back.

— to protect biodiversity

— Their prey would increase out of control.

— They are an important part of the food chain/web.

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

— Habitats provide the resources animals need to survive.

— Habitats provide food and shelter.

— The growth and survival of organisms depend on the physical conditions of their habitat.

— The resources available in the habitat limit the number of organisms it can support.

— The carrying capacity is dependent on the resources of the habitat.

59 [1] Allow 1 credit for stating an advantage and a disadvantage of automobile emission testing. Acceptable responses include, but are not limited to:

Advantage:

— The law helps to reduce the amount of air pollution in an area.

— The emissions from cars will contain fewer harmful chemicals.

Disadvantage:

— Because of the emission-control systems, cars may be more expensive.

— Testing is expensive.

— Repairing the automobile to pass inspection is expensive.

60 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— amino acids

— dipeptides

61 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Each enzyme works best within a specific range of temperatures.

— If the temperature is too high/low, the enzyme might not function.

— The enzyme could be denatured/change shape at some temperature.

— The enzyme is a human enzyme and works best at body temperature.

— Temperature affects the rate of reaction/enzyme activity.

62 [1] Allow 1 credit for stating what the result would be if the same enzyme that was added to test tube *B* was added to a test tube containing starch and supporting the answer. Acceptable responses include, but are not limited to:

— Nothing, because enzymes are specific.

— There would be no reaction with the starch because this enzyme acts only on proteins.

— Enzymes only act on certain substances, so an enzyme that acts on protein would not act on starch.

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

— They diffuse into body cells/the bloodstream.

— They are absorbed from the small intestine into the blood.

— They are taken to the cells by the circulatory system.

— The molecules are carried to the cells by the blood.

— The products of digestion are absorbed by the villi.

— They enter cells and are used there.

— They are used to build muscle or other compounds/proteins and to release energy.

Note: The student's response to the bulleted items in question 64–66 need *not* appear in the following order.

64 [1] Allow 1 credit for identifying *one* error in the researcher's experimental design. Acceptable responses include, but are not limited to:

— The sample size for the experiment was too small.

— There were not enough women in the study.

— The range of ages added a second variable.

— There were fetuses of different genders.

— There were too many variables.

65 [1] Allow 1 credit for identifying *one* way, other than affecting estrogen levels, that secondhand smoke could affect a developing embryo. Acceptable responses include, but are not limited to:

— It could lead to miscarriages/premature labor/birth.

— The babies born could have a lower birth weight.

— They could have asthma/birth defects/addiction.

— They might receive less oxygen/nutrients.

66 [1] Allow 1 credit for explaining why the process of peer review is an important step in this research. Acceptable responses include, but are not limited to:

— Other scientists may find errors that the original researchers did not.

— Other scientists could repeat the experiment to confirm the result.

— Peer review allows other researchers to evaluate the results of an experiment.

— Peer review improves the validity of the study.

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

— snakes – The owl would compete with the snakes for the mouse population.

— hawks – The owls feed on much of the same food as the hawks, so there would be fewer hawks.

— mountain lions – The owls would compete for the rabbit population.

— grasses – The owls would eat rabbits and mice, and there would be more grass.

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

— lack of food

— fewer lemmings

— overpopulation of snowy owls

— changes in temperature

— loss of habitat/deforestation

— increased competition

69 [1] Allow 1 credit for stating level *C* and supporting the answer. Acceptable responses include, but are not limited to:

— At each level, as you go up from the plants to the herbivores to the carnivores, energy is lost.

— Energy enters the ecosystem with green plants capturing energy from sunlight. There is less energy available as it is passed on to the consumers.

— Energy is lost at each feeding level.

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

— There are few predators present in New Mexico, so fur color does not influence survival.

— Predators can see the mice better if their fur color does not match the rock color in Arizona.

— In New Mexico, both fur colors are equally suited to the environment, unlike Arizona.

— If there were no owls/hawks in New Mexico, then the fur color would not matter.

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

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

— The mice in the two populations evolved from the same ancestral population.

— They evolved from a common ancestor.

— The same mutation occurred in both populations.

— Some of the mice migrated.

— They are members of the same species.

— The populations interbred.

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

— Many mutations occur by chance. Natural selection acts on traits. Depending on whether or not the mutation increases or decreases the chance of survival, the mutation for a trait might or might not be passed on to the next generation.

— Once a mutation occurs, natural selection acts on it. Natural selection does not cause mutations.

— Mutations happen by chance, but natural selection depends on mutations that exist and how the environment interacts with them.

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 cactus finch and supporting the answer. Acceptable responses include, but are not limited to:

— The cactus finch has a probing bill that can reach the nectar in the flowers.

— The cactus finch is a plant eater with a long, narrow beak.

78 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— They aren't competing for the same food.

— Ground finches are mostly plant eaters while tree finches are mostly animal eaters.

— They occupy a different niche.

— They live in different areas.

79 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— Starch is too large to move across the cell membrane, and glucose is smaller and can move across the cell membrane.

— Starch is a bigger molecule.

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

— If his pulse rate were normal, it would indicate that the muscles have removed wastes and have enough energy available to resume exercising.

— Normal pulse rate is the same as resting pulse rate.

— When his pulse rate returns to normal, it indicates that there is no longer a need for more oxygen/excretion of excess carbon dioxide.

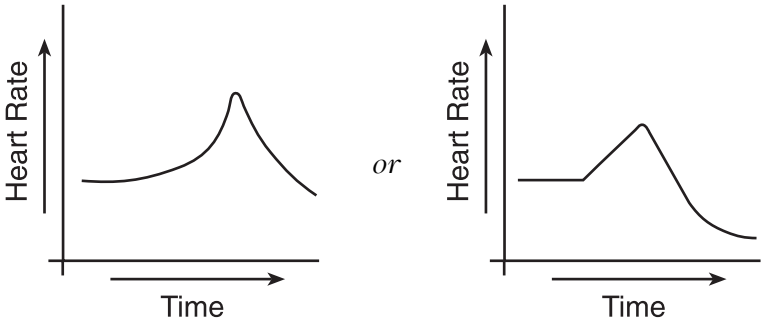
— This shows that the body has returned to a homeostatic balance.

81 MC on scoring key

82 MC on scoring key

83 [1] Allow 1 credit for a correctly drawn graph that shows that pulse rate increases when running and gradually decreases when resting.

Examples of 1-credit responses:



84 [1] Allow 1 credit for identifying one waste product that is released during exercise and explaining how this waste product leaves the body. Acceptable responses include, but are not limited to:

Carbon dioxide:

— It diffuses into the blood and is carried to the lungs, where it is exhaled.

— As you exercise, carbon dioxide is carried to the lungs, where it is exhaled.

— Carbon dioxide is exhaled.

Sweat:

— contains salts and other minerals, passes out through pores in the skin

— evaporates, cooling off the body

— leaves as moisture

Heat:

— It is radiated from the skin.

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

— to determine an evolutionary relationship

— to determine parents of children/identity of a criminal

— to screen for genetic disorders/mutations

— to see if two organisms are closely related/have a common ancestor

— to analyze similarities in DNA

The *Chart for Determining the Final Examination Score for the August 2017 Regents Examination in Living Environment* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Thursday, August 17, 2017. 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

August 2017 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		33	52	
Key Idea 2		31,37		64
Key Idea 3		36	44, 45	66, 70
Appendix A (Laboratory Checklist)			47	
Standard 4				
Key Idea 1	1, 5, 6, 9, 22, 24, 29		54, 55	60, 63
Key Idea 2	4, 7, 16, 23, 25	34	48, 50	
Key Idea 3	17, 26	40, 41	49	71, 72
Key Idea 4	18, 27, 28	32	51	65
Key Idea 5	2, 3	35, 38, 39, 42, 43	46, 53	61, 62
Key Idea 6	10, 11, 12			56, 57, 58, 67, 68, 69
Key Idea 7	8, 13, 14, 15, 19, 20, 21, 30			59

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