FOR TEACHERS ONLY

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

LIVING ENVIRONMENT

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

Part B–1

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

Part B–2

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

Part D

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

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, January 27, 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.

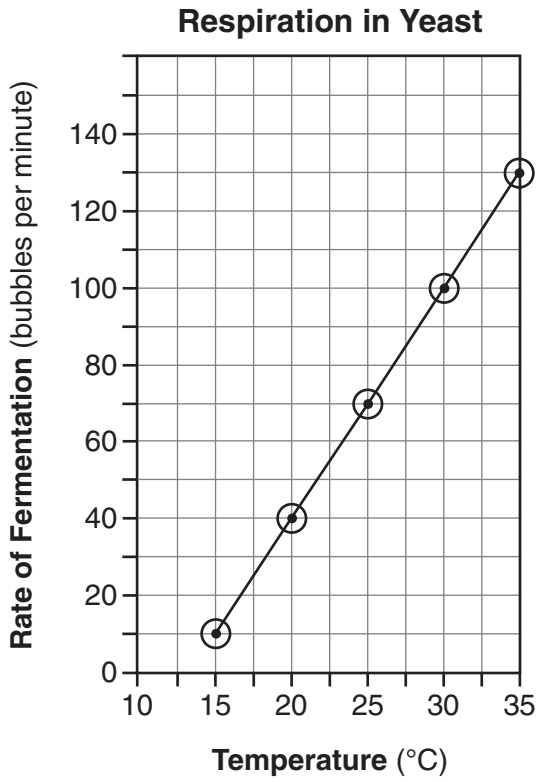
Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Part B–2

44 [1] Allow 1 credit for marking an appropriate scale, without any breaks, 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 and 45:



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

Do *not* assume that the intersection of the *x*- and *y*-axis 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 for plotting points 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 rate increases as temperature increases.

— As the temperature decreases, the rate decreases.

— The number of carbon dioxide bubbles produced increases with temperature.

— Fermentation increases as temperature goes up.

— It is a direct relationship.

47 MC on scoring key

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

— The more closely related the organisms, the fewer amino acid differences.

— A greater number of differences probably means that they are not closely related.

49 MC on scoring key

50 MC on scoring key

51 [1] Allow 1 credit for 13 mm (+/– 2mm).

Note: Do *not* allow credit for a student response in centimeters.

52 [1] Allow 1 credit.

Example of a 1-credit response:

Disk	**Measurement of ZOI** (mm) *or* **ZOI** (mm) *or* **Diameter** (mm)
A	**13** (+/– 2mm)
B	**8**
C	0
D	**9**

Note: For measurement of disk *A*, allow credit for the student's response to question 51. Do *not* allow credit if appropriate units are not included in the heading.

53 [1] Allow 1 credit for *C* or disk *C* and supporting the answer. Acceptable responses include, but are not limited to:

— no ZOI

— did not kill bacteria so probably contains no antibiotics

54 [1] Allow 1 credit for *A* and explaining why the antibiotic was selected. Acceptable responses include, but are not limited to:

— the least amount of bacteria around the antibiotic disk

— the biggest zone of inhibition

— the biggest area of no bacteria

Note: Allow credit for an answer consistent with the student's data table for question 52.

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

— Termites cannot digest cellulose, but the microbes can do it for them.

— The microbes digest the cellulose into glucose, which is small enough to be absorbed by the termite.

— The microbes provide the substance needed to break down the cellulose into glucose.

Part C

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

— Overuse of antibacterial agents may result in an increase in the number of resistant bacteria.

— Some bacteria are beneficial and may also be killed.

— Antibacterial agents kill nonresistant bacteria, allowing the resistant ones to survive and reproduce.

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

— There is not enough food, so some die of starvation.

— disease

— Predators kill them.

— hunting

— colder weather

— They are over the carrying capacity.

— increased competition

— They migrate.

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

— Carrying capacity is the maximum number of individuals the environment can support over an extended period of time.

— It is the largest population size that can survive in an area year-round.

— It is the maximum population size that an area's resources can support.

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

— less trash put in landfills

— less use of raw materials/limited resources

— reduced use of nonrenewable resources

— less litter in the environment

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

Factor: People won't recycle.
Correction: Fine individuals who put recyclables in their garbage.

Factor: lack of education about recycling
Correction: Distribute recycling information *or* sponsor television and radio ads.

Factor: too time consuming
Correction: Companies can collect unsorted recyclables.

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

Community Action: requiring deposits on water/soda bottles
Improvement: reduce solid waste

Community Action: requiring reduced packaging of products *or* using reusable shopping bags
Improvement: less waste produced

Community Action: building power plants that use solid waste for fuel
Improvement: recover energy from solid waste

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

— mutation

— sexual reproduction

— meiosis/crossing-over

— recombination of genes

— natural selection

— sexual selection

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

— The absence or presence of predators determines which trait is selected for.

— The female guppies determine which trait is selected for.

— Colors present in the environment determine which trait is selected for.

— type of predators present

— the clarity of the water

Note: The student's response to the bulleted items in question 64–67 need *not* appear in the following order.

64 [1] Allow 1 credit for identifying *one* hormone present in a female that is involved in regulating the reproductive cycle. Acceptable responses include, but are not limited to:

— progesterone

— estrogen

— LH

65 [1] Allow 1 credit for stating *one* way the nucleus of a sex cell is different from the nucleus of a body cell. Acceptable responses include, but are not limited to:

— It has half the normal chromosome number/half of the genes.

— Sex cells are haploid/monoploid.

— 23 chromosomes in sex cells, 46 in body cell

66 [1] Allow 1 credit for stating how the normal chromosome number for humans is maintained from one generation to the next. Acceptable responses include, but are not limited to:

— The egg and sperm each have half the normal chromosome number, and when they join, it restores the normal number for the species.

— through the process of gamete production and fertilization

— Each parent contributes half of the chromosomes.

67 [1] Allow 1 credit for identifying *one* action by the mother that can influence the development of the embryo and stating a result of that influence. Acceptable responses include, but are not limited to:

— Alcohol use can lead to Fetal Alcohol Syndrome.

— Smoking can lead to low birth weight.

— Poor nutrition can lead to underweight babies.

— Drug use can lead to birth defects.

— Good nutrition can lead to a healthy baby.

— Drinking alcohol puts the embryo at risk.

— Proper prenatal care might detect potential problems early so they can be treated.

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

— They lacked adaptations to the changing environmental conditions.

— They were unable to compete for food or other resources.

— They did not have the variations required for survival in their environment.

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

— Larger size made them more successful in competing for food.

— Being larger made them better able to protect themselves.

— Larger elephants had more offspring that survived.

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

— Elephants reproduce more slowly than insects/bacteria.

— Insects have many more offspring at one time.

— Bacteria have a short generation time, compared to elephants.

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

— They both involve mitosis.

— Both processes produce cells containing identical genetic information.

— The cells are produced asexually.

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

Molecule:

antibody: The antibody binds to a specific pathogen

or

enzyme: An enzyme has a specific shape that must match the shape of the molecules with which it interacts (lock and key or induced fit).

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 data table as shown below.

Pulse Rates

Trial Number	15 Second Pulse Rate	1 Minute Pulse Rate
1	19	76
2	18	**72**
3	17	68
Average	**18**	72

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

— to add a solution to a slide without removing the coverslip

— to add stain (or water) to a slide

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

Example of a 1-credit response:

Student Observations

Plant Species	Observations When Mixed With Indicator Powder
Botana curus	produced a lot of bubbles/fizzed
X	no reaction
Y	**produced a lot of bubbles** *or* **fizzed** *or* **reacted**
Z	no reaction

80 [1] Allow 1 credit for stating which trial from the above chart provides the best data to support his claim and supporting the answer. Acceptable responses include, but are not limited to:

— Trial 2, because more students were used.

— Trial 2, because they squeezed more when they warmed up first.

— Neither, because the averages were not very different.

81 MC on scoring key

82 MC on scoring key

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

— Fruit and seed eaters have shorter, thicker beaks.

— The nectar-eating birds have longer, thinner beaks.

— Their beaks are shorter.

84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

— The honey creepers were well adapted to the conditions on the islands.

— They had evolved specific skills/structures to find food on Hawaii.

— They were better adapted than the new arrivals.

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

— There were no honey creepers to compete with.

— There was enough food for them on the other island.

— They were well adapted to the conditions on the other island.

The *Chart for Determining the Final Examination Score for the January 2016 Regents Examination in Living Environment* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Wednesday, January 27, 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

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

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