

FOR TEACHERS ONLY

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

LE

LIVING ENVIRONMENT

Wednesday, August 16, 2006 — 12:30 to 3:30 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 3 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 <http://www.emsc.nysed.gov/osa/> and select the link "Examination 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.

Part A and Part B-1

Allow 1 credit for each correct response.

Part A			Part B-1	
14	113	212	314	362
21	122	221	321	374
32	133	233	332	382
43	141	244	344	393
52	154	252	351	401
61	161	263		
72	172	272		
83	184	281		
92	194	294		
104	203	303		

LIVING ENVIRONMENT – *continued*

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*.

Use only *red* ink or *red* pencil in rating Regents papers. Do not attempt to *correct* the student's work by making insertions or changes of any kind.

Allow 1 credit for each correct response for multiple-choice questions.

On the detachable answer sheet for Part A and Part B–1, indicate by means of a checkmark each incorrect or omitted answer to multiple-choice questions. In the box provided in the upper right corner of the answer sheet, record the number of questions the student answered correctly for each of these parts.

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 all the open-ended questions on a student's answer paper.

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. In the student's examination booklet, record the number of credits earned for each answer in the box printed to the right of the answer lines or spaces for that question.

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.

Raters should enter the scores earned for Part A, Part B–1, Part B–2, Part C, and Part D on the appropriate lines in the box printed on the answer sheet and should add these 5 scores and enter the total in the box labeled "Total Raw Score." Then the student's raw score should be converted to a scaled score by using the conversion chart that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Wednesday, August 16, 2006. The student's scaled score should be entered in the box labeled "Final Score" on the student's answer sheet. The scaled score is the student's final examination score.

All student answer papers that receive a scaled score of 60 through 64 **must** be scored a second time. For the second scoring, a different committee of teachers may score the student's paper or the original committee may score the paper, except that no teacher may score the same open-ended questions that he/she scored in the first rating of the paper. The school principal is responsible for assuring that the student's final examination score is based on a fair, accurate, and reliable scoring of the student's answer paper.

Because scaled scores corresponding to raw scores in the conversion chart may change from one examination 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

41 4

42 3

43 1

44 Allow 1 credit for stating which strain of rice was produced as a result of genetic engineering and supporting the answer. Acceptable responses include, but are not limited to:

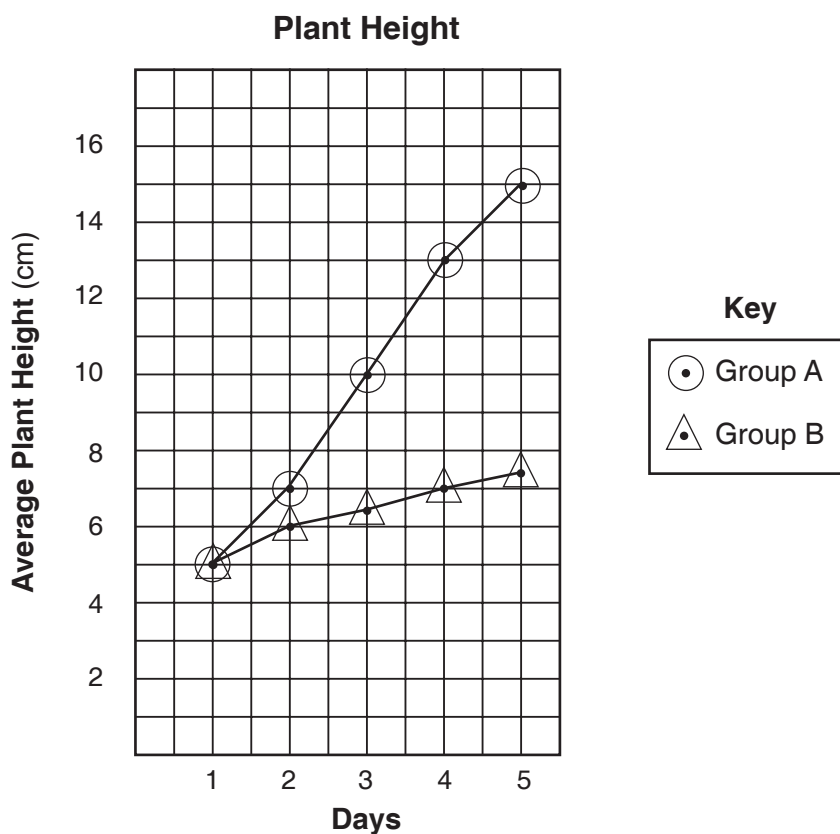
- Stress-Tolerant Rice: because it was made by inserting genes
- Trehalose-Producing rice: because it contains genes from bacteria
- Stress-Tolerant Rice: because bacterial genes for trehalose production were inserted into rice plants

45 Allow 1 credit for stating *one* reason that further testing must be done before rice plants that produce trehalose are approved for human consumption. Acceptable responses include, but are not limited to:

- to see if it is safe
- to see if it has nutritional value

- 46 Allow 1 credit for marking an appropriate scale on the axis labeled “Average Plant Height (cm).”
- 47 Allow 1 credit for plotting the data for the average height of the plants in group A, surrounding each point with a small circle, and connecting the points.
- 48 Allow 1 credit for plotting the data for the average height of the plants in group B, surrounding each point with a small triangle, and connecting the points.

Example of a 3-credit graph for questions 46–48:



Note: Do not allow credit for plotting points that are not in the data table, e.g., (0,0).
Do not deduct more than 1 credit for plotting points that are not in the data table.

- 49 Allow 1 credit for stating *one* valid conclusion that can be drawn concerning the effect of gibberellic acid on bean plant growth. Acceptable responses include, but are not limited to:
- Bean plants given gibberellic acid grew taller *or* faster than those that were not.

LIVING ENVIRONMENT – *continued*

50 1

51 Allow 1 credit for providing evidence from the data table showing that a salt marsh plant is sensitive to its environment. Acceptable responses include, but are not limited to:

— The amount of glucose produced varies as the environmental temperature changes.

52 3

53 2

54 Allow 1 credit for stating *one* possible reason for the change in glucose production when the temperature was increased from 30°C to 40°C. Acceptable responses include, but are not limited to:

- The enzymes responsible for the process are less effective above 30°C.
- Chemical reactions are affected by temperature.
- The enzymes are altered (or destroyed) by heat.

55 4

Part C

- 56** Allow a maximum of 5 credits for designing an experiment to determine which of three saltwater concentrations (2%, 4%, or 6%) is best for hatching brine shrimp eggs, allocated as follows:
- Allow 1 credit for stating how many containers to use in the experiment, and describing what would be added to each container in addition to the eggs. Acceptable responses include, but are not limited to
 - Three containers, each with a different salt concentration (2%, 4%, and 6%), should be used.
 - four containers, one with water, the other three with different salt concentrations (2%, 4%, and 6%)
 - four containers, a control and the others with 2%, 4%, and 6% salt solution
 - Allow 1 credit for stating *two* factors that must be kept constant in all the containers. Acceptable responses include, but are not limited to:
 - temperature of the water
 - number of eggs per container
 - salt-water level or volume
 - size of container
 - amount of time
 - Allow 1 credit for stating what data must be collected during this experiment. Acceptable responses include, but are not limited to:
 - how many eggs hatch in each salt concentration
 - Allow 1 credit for stating *one* way to organize the data so that they will be easy to analyze. Acceptable responses include, but are not limited to:
 - arrange the data in a data table *or* a spreadsheet
 - graph the data
 - Allow 1 credit for describing a result that would indicate the best salt solution for hatching brine shrimp eggs. Acceptable responses include, but are not limited to:
 - The solution that has the most eggs hatch is the best one to use.

LIVING ENVIRONMENT – *continued*

57 Allow a maximum of 4 credits for describing a disease or disorder that can occur as a result of a factor other than a pathogenic organism, allocated as follows:

- Allow 1 credit for the name of the disease or disorder.
- Allow 1 credit for *one* specific factor that causes this disease or disorder.
- Allow 1 credit for *one* major effect of this disease or disorder on the body, other than death.
- Allow 1 credit for *one* way this disease or disorder can be prevented, treated, or cured.

Examples of 4-credit responses:

PKU is a disorder that can result in damage to the brain. It is caused by inheritance of a mutation. Children with PKU will be developmentally delayed. If a specific amino acid is removed from the child's diet, the symptoms will not occur.

or

Diabetes is a disease that can result from an inability to produce enough insulin. The level of glucose in the blood and urine will be high. This may lead to blindness or kidney problems. Frequent urination and thirst are major symptoms. Insulin injections can be used to regulate blood sugar levels.

Note: If a disease caused by a pathogenic organism is chosen, a maximum of 3 credits may be allowed if the other three bullets are addressed correctly for the disease chosen.

58 Allow a maximum of 4 credits for describing how *two* cell structures interact to help maintain a balanced internal environment in a cell, allocated as follows:

- Allow a maximum of 2 credits, 1 credit for each correct function of the *two* structures selected. Acceptable responses include, but are not limited to:
 - mitochondrion—release of energy from nutrients
 - ribosome—protein synthesis
 - cell membrane—regulates movement of materials into and out of the cell
 - nucleus—regulates cell functions *or* carries the genetic code
 - vacuole—storage
- Allow a maximum of 2 credits, 1 credit for describing how each of the *two* structures selected contributes to the functioning of the other. Acceptable responses include, but are not limited to:
 - The nucleus contains the code for the enzymes that function in the mitochondrion. The mitochondrion provides energy that is needed by the nucleus.

LIVING ENVIRONMENT – *continued*

59 Allow a maximum of 4 credits for discussing fossil fuels and alternative energy sources, allocated as follows:

- Allow 1 credit for stating *one* disadvantage of burning fossil fuels for energy. Acceptable responses include, but are not limited to:
 - They pollute the atmosphere.
 - They lead to acid rain.
 - They lead to global warming.
 - Fossil fuels are a limited resource.

- Allow 1 credit for identifying *one* energy source that is an alternative to using fossil fuels. Acceptable responses include, but are not limited to:
 - solar energy
 - windmills
 - water power
 - nuclear fuels

- Allow 1 credit for stating *one* advantage of using the alternative energy source identified. Acceptable responses include, but are not limited to:
 - does not pollute the environment (solar energy)
 - is renewable (water power)
 - Fossil fuels are not burned. (nuclear)

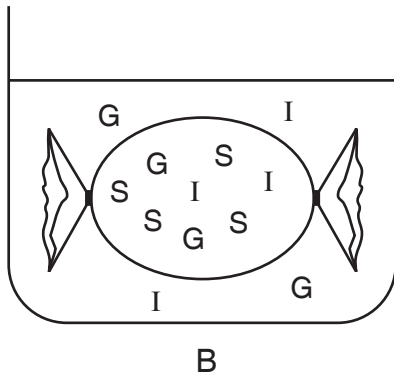
- Allow 1 credit for stating *one* disadvantage of using the alternative energy source identified. Acceptable responses include, but are not limited to:
 - Windmills are very noisy.
 - Dams built for water power destroy habitats.
 - Nuclear fuels produce dangerous wastes.
 - high cost of changing technology
 - Sufficient solar, wind, or water is not available worldwide.

Part D

60 Allow a maximum of 3 credits, allocated as follows:

- Allow 1 credit for showing *I*s both inside and outside of the artificial cell.
- Allow 1 credit for showing *G*s both inside and outside of the artificial cell.
- Allow 1 credit for showing all the *S*s inside of the artificial cell.

Example of a 3-credit response:



61 Allow 1 credit for stating what is observed when there is a positive test for starch using the starch indicator. Acceptable responses include, but are not limited to:

- a color change
- The color changes from amber to blue black.

62 Allow 1 credit for identifying the technique normally used to separate the DNA fragments to produce the patterns shown in the diagram. Acceptable responses include but are not limited to:

- electrophoresis
- gel electrophoresis

63 Allow 1 credit for stating *one* way the data supports the inference that the three bird species may be closely related. Acceptable responses include, but are not limited to:

- Since they have similar amino acid sequences, they may be closely related.
- Since they have amino acid sequences that are very much alike, the species have similar DNA.

64 Allow 1 credit for stating *one* type of additional information that could be used to determine if these three species are closely related. Acceptable responses include but are not limited to:

- comparing embryos
- cytology
- comparing fossils
- comparing bone structures
- additional sequence studies

65 4

66 Allow 1 credit for describing *one* way in which a pulse rate below 45 would disrupt homeostasis in an individual whose average resting pulse rate falls in the range of 71–80. Acceptable responses include, but are not limited to:

- Circulation of blood would be reduced.
- Oxygen (O₂) delivery would be reduced.
- Cells could not release enough energy.
- unable to regulate body temperature

67 Allow 1 credit for stating *one* way the data would most likely be different if the pulse rates were collected immediately after exercising instead of during lunch. Acceptable responses include, but are not limited to:

- The average pulse rates would be higher.
- Increased activity causes an increase in pulse rate.

68 Allow 1 credit for identifying *one* bird that would most likely compete for food with the large tree finch and supporting the answer. Acceptable responses include, but are not limited to:

- Woodpecker finch: they use the same food resources
- Small tree finch: both eat mainly animal food

69 Allow a maximum of 2 credits, 1 credit for identifying *one* trait, other than beak characteristics, that would contribute to the survival of a finch species and 1 credit for stating *one* way this trait contributes to the success of this species.

Examples of 2-credit responses:

- Faster *or* more aggressive birds get to seeds faster.
- Larger *or* stronger birds compete successfully.
- Coordination helps an individual avoid predators.

The *Chart for Determining the Final Examination Score for the August 2006 Regents Examination in Living Environment* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Wednesday, August 16, 2006. 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.

Submitting 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 www.emsc.nysed.gov/osa/exameval/.
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 2006 Living Environment

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

Part D 60-69	
Lab 1	62,63,64
Lab 2	65,66,67
Lab 3	68,69
Lab 5	60,61