

# FOR TEACHERS ONLY

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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

## LIVING ENVIRONMENT

Friday, June 15, 2001 – 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 3 before rating student papers.

**Part A (35 credits)**

**Allow a total of 35 credits for Part A, one credit for each correct answer.**

(1) 3	(13) 3	(25) 3
(2) 1	(14) 2	(26) 3
(3) 2	(15) 1	(27) 4
(4) 4	(16) 3	(28) 3
(5) 2	(17) 1	(29) 1
(6) 3	(18) 2	(30) 2
(7) 4	(19) 4	(31) 4
(8) 1	(20) 2	(32) 1
(9) 2	(21) 1	(33) 3
(10) 4	(22) 2	(34) 4
(11) 1	(23) 4	(35) 1
(12) 3	(24) 1	

## Directions to the Teachers

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 Administering and Scoring Regents Examinations in Living Environment and Physical Setting/Earth Science*.

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 in Part A and Part B.

On the detachable answer sheet for Part A, 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 that part.

At least two science teachers must participate in the scoring of the Part B and Part C 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 to 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, and Part C on the appropriate lines in the box printed on the answer sheet and should add these 3 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 printed at the end of this Scoring Key and Rating Guide. The student's scaled score should be entered in the labeled box on the student's answer booklet. The scaled score is the student's final examination score.

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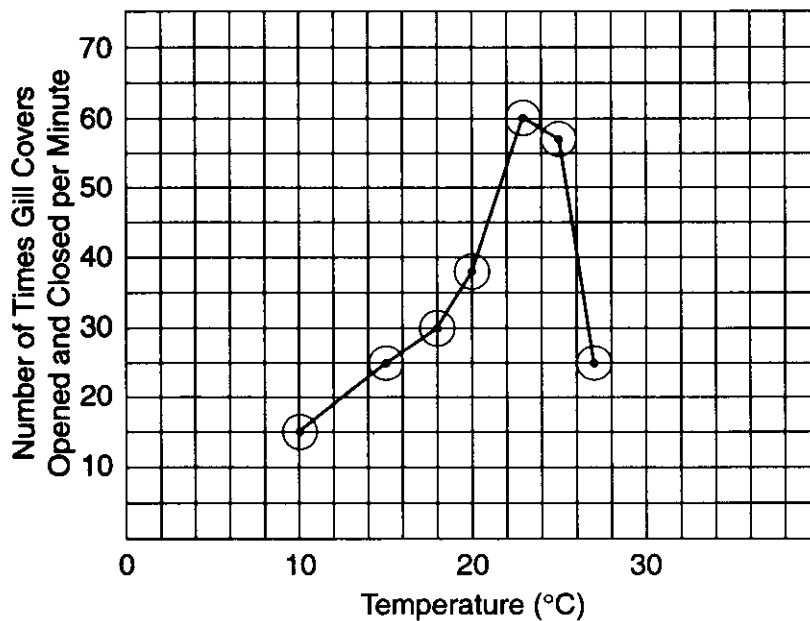
## Part B

- (36) Allow 1 credit for a correct statement of how the plant population would be affected if decomposers decreased *and* a correct explanation of why. Appropriate responses include, but are not limited to:
- The number of plants would decrease *because* minerals/nutrients would not be recycled.
  - The plant population would decrease *because* material cycles would slow down.
- (37) 1
- (38) 1
- (39) 2

Rating Instructions for Questions 40–42:

- (40) Allow 1 credit for labeling the x-axis correctly and indicating the units (e.g., **Temperature (°C)** ).
- (41) Allow 1 credit for marking an appropriate scale on both axes.
- (42) Allow 1 credit for plotting the data correctly, surrounding each point with a small circle, and connecting the points.

Example of an appropriate graph:



- (43) 3
- (44) 1
- (45) Allow 1 credit for stating one known benefit of daily exposure to the sun. Appropriate responses include, but are not limited to:
- kills bacteria
  - produces vitamin D
  - treats diseases and/or wounds
- (46) Allow 1 credit for explaining that the “tanning myth” refers to the idea that tans are good for people or a sign of good health.
- (47) 3
- (48) 2
- (49) Allow 1 credit for stating one effect of an increasing level of TSH-releasing factor. Appropriate responses include, but are not limited to:
- The anterior pituitary is stimulated.
  - TSH is released.
  - The level of thyroxine increases.
- (50) Allow 1 credit for a correct explanation of how muscle cells and nerve cells perform different functions. Appropriate responses include, but are not limited to:
- Different genes are “turned on” or “turned off” in different cells.
  - Cells are specialized for specific functions.
  - Different parts of DNA are used in different types of cells.
- (51) Allow 1 credit for a correct reason for the difference in final population size indicated by graphs *A* and *B*. Appropriate responses include, but are not limited to:
- Species 1 may be better adapted to this environment than species 2.
  - Species 2 requires more food than species 1.
  - The environment in the culture dish is better suited to the requirements of species 1.
- (52) Allow 1 credit for a correct explanation of what causes species 1 to level off at letter *D* on graph *A*. Appropriate responses include, but are not limited to:
- The carrying capacity has been reached.
  - There is not enough food to support a larger population.
  - The population is limited by the amount of available space.
- [OVER]

- (53) Allow 1 credit for a scientifically correct explanation for the results shown in graph C. Appropriate responses include, but are not limited to:
- There is competition between species 1 and species 2.
  - Species 1 eats species 2.
  - There is not enough space to support two species.
- (54) Allow 1 credit for a scientifically correct prediction of what will happen if the culture shown in graph C is maintained for an additional week. Appropriate responses include, but are not limited to:
- Species 2 will all die.
  - Species 1 will level off.
  - Species 1 may decrease in number.
- (55) Allow 1 credit for an explanation of why people with AIDS often develop many other diseases. Appropriate responses include, but are not limited to:
- The virus that causes AIDS interferes with the functioning of the immune system.
  - The virus that causes AIDS interferes with a cell's ability to produce antibodies.
  - The immune system in people with AIDS is impaired.
- (56) Allow 1 credit for identifying chloroplast as the structure that would indicate that the organism was an autotroph.
- (57) 4
- (58) 3
- (59) 2
- (60) 1
- (61) 1
- (62) 2
- (63) 4
- (64) Allow a total of 2 credits, 1 for each correctly identified body activity that would change in response to an increase in muscle activity and an accurate description of how it would change. Appropriate responses include, but are not limited to:
- heartbeat – It would speed up.
  - breathing – It would speed up.
  - sweating – It would increase.

### Part C

- (65) Allow a total of 5 credits for a description of the effect of adding iron to the hydroponic solution. The response must include:
- a hypothesis to be tested in the new experiment [Note: A hypothesis is a statement with a prediction. (E.g., Adding iron to the hydroponic solution will improve the growth of lettuce.)] [ 1 credit ]
  - how the control group will be treated differently from the experimental group (e.g., The control group should be grown in the solution that the company uses, which contains water, nitrogen, and phosphorus, while the growth solution for the experimental group should contain water, nitrogen, phosphorus, and iron.) [ 1 credit ]
  - two factors that must be kept the same in both the experimental and control groups (e.g., the intensity of light or the number of plants in the experimental and control groups or any other scientifically correct answer) [2 credits ]
  - the type of data that should be collected to support or refute the hypothesis (e.g., the height of the plants or the mass of the plants or the total leaf area of the plants) [Note: Growth can only be accepted if attached to a measurable quantity.] [ 1 credit ]
- (66) Allow a total of 2 credits, 1 for each of *two* specific health problems that could result from living near the waste recycling plant. Appropriate responses include, but are not limited to:
- asthma
  - respiratory infections
  - allergic reactions
  - cancer
  - bacterial infections
  - viral infections
  - disease linked to a pathogen
- (67) Allow 1 credit for *one* cause of *one* health problem that can be associated with the presence of the waste recycling plant. (The health problem addressed in the question does not have to be one of those identified in question 66.) Appropriate responses include, but are not limited to:
- particles in the air
  - presence of viruses or bacteria or trucks
  - pollution particles or chemicals in air or water
  - carcinogens

[OVER]

- (68) Allow 1 credit for *one* ecological benefit of recycling wastes. Appropriate responses include, but are not limited to:
- conservation of natural resources
  - protection of finite resources
  - energy conservation
  - reduction in pollution
- (69) Allow a total of 2 credits for a correct explanation of what a vaccine is and what it does in the body. The explanation should include an identification of the contents of the vaccine (1 credit) and the reaction that occurs (1 credit). Appropriate responses include, but are not limited to:
- A vaccine contains weakened microbes or parts of microbes that stimulate the immune system to produce antibodies.
  - Vaccines contain the source of the disease in a dead or weakened form. When introduced into the body, the vaccine triggers the body's immune system to produce antibodies that are specific to the source of the disease.
- (70) Allow 1 credit for stating *one* way a child could develop immunity to a certain disease without being vaccinated. Appropriate responses include, but are not limited to:
- Exposure to the microbes stimulates immunity.
  - Receiving antibodies can provide immunity.
  - inborn immunities
  - receiving antibodies from mother's milk
- (71) Allow 1 credit for identifying *one* part of a research plan that must be followed when developing a new vaccine. The answer can relate to creating, isolating, testing, or funding. Appropriate responses include, but are not limited to:
- use a large sample
  - check for possible side effects
  - determine the method to be used to administer the vaccine
  - identify the organism causing the disease

- (72) Allow a total of 4 credits for describing positive and negative effects of the introduction of predators to reduce the number of aphids that feed on grain crops in an agricultural area of the United States. Allow 2 credits for descriptions of *two* advantages of this method of pest control and 2 credits for descriptions of *two* dangers.

Possible advantages include, but are not limited to:

- Chemicals are not added to the environment.
- Biological controls are more specific than chemical controls.
- Ladybugs are less likely to kill beneficial organisms.

Possible dangers include, but are not limited to:

- The control insects may eat the food of other organisms.
- The population of natural predators of the aphids may be eliminated or greatly reduced.
- The control organism may become overpopulated.

- (73) Allow a total of 3 credits for explaining why carnivores should be protected. The explanation must include information concerning:

- prey population growth (e.g., If predators are destroyed, the prey population will increase.) [ 1 credit ]
- extinction (e.g., If too many carnivores of a particular species are killed, the species may become extinct.) [1 credit ]
- importance of carnivores in an ecosystem (e.g., By feeding on herbivores, carnivores help keep certain species of plants from being eliminated in a given area.) [1 credit ]

Example of a 3-credit response:

Carnivores are important in an ecosystem because by reducing the number of prey organisms, the food organisms of the prey are kept from being eliminated from the environment. If the predators were destroyed, the prey population would increase, perhaps to the point of consuming so many of the organisms that the prey feed upon, that these organisms would become extinct.



## Map to Core Curriculum

<b>Standards</b>	<b>Question Numbers</b>		
	<b>Part A 1-35</b>	<b>Part B 36-64</b>	<b>Part C 65-73</b>
Standard 1—Analysis, Inquiry, and Design			
Key Idea 1		45,46,47,48	
Key Idea 2		59	65, 71
Key Idea 3	1,2,10	40,41,42,43,44,49,60,61,62	65
Appendix A (Laboratory Checklist)	1	40,41,42,43,44,59,60	65
Standard 4			
Key Idea 1	3,5,6,7,8	36,56,64	
Key Idea 2	4,9,10,11,12,13	50	
Key Idea 3	11,14,15,16,17,19	57,58	
Key Idea 4	18,19,20,21		
Key Idea 5	3,22,23,25,26,27,29	49,55,56,61,62,63,64	67,69,70
Key Idea 6	24,25,28,30,33,34	37,38,39,51,52,53,54,62,63	73
Key Idea 7	30,31,32,35		66,67,68,72,73

## Regents Examination in Living Environment

June 2001

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

Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score
85	100	56	75	27	54
84	99	55	75	26	53
83	97	54	74	25	51
82	96	53	74	24	50
81	95	52	73	23	49
80	94	51	73	22	47
79	93	50	72	21	46
78	91	49	71	20	44
77	90	48	71	19	43
76	89	47	70	18	41
75	88	46	70	17	40
74	88	45	69	16	38
73	87	44	68	15	36
72	86	43	68	14	34
71	85	42	67	13	32
70	84	41	66	12	30
69	83	40	66	11	28
68	83	39	65	10	26
67	82	38	64	9	24
66	81	37	63	8	21
65	81	36	63	7	19
64	80	35	62	6	17
63	79	34	61	5	14
62	79	33	60	4	11
61	78	32	59	3	9
60	78	31	58	2	6
59	77	30	57	1	3
58	76	29	56	0	0
57	76	28	55		

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 scaled score that corresponds to that raw score. The scaled score is the student's final examination score. Enter this score in the space labeled "Final Score" on the student's answer sheet.

All student answer papers that receive a scaled score of 62 through 68 **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 in the scoring key for that administration be used to determine the student's final score. The chart above is usable only for this administration of the living environment examination.