

FOR TEACHERS ONLY

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

PS-CH

PHYSICAL SETTING/CHEMISTRY

Wednesday, June 22, 2011 — 1:15 to 4:15 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/apda/> 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.

Part A and Part B-1

Allow 1 credit for each correct response.

Part A			Part B-1	
1 3	11 4	21 1	31 1	41 1
2 2	12 2	22 3	32 3	42 4
3 1	13 4	23 2	33 3	43 2
4 3	14 1	24 2	34 2	44 3
5 1	15 4	25 3	35 2	45 4
6 2	16 3	26 1	36 1	46 3
7 3	17 3	27 4	37 2	47 4
8 4	18 4	28 2	38 3	48 2
9 3	19 1	29 3	39 3	49 3
10 1	20 2	30 4	40 4	50 4

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Physical Setting/Chemistry examination. 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* correct the student's work by making insertions or changes of any kind.

For Part A and Part B–1, indicate by means of a check mark each incorrect or omitted answer. In the box provided at the end of each part, record the number of questions the student answered correctly for that part.

At least two science teachers must participate in the scoring of each student's responses to the Part B–2 and Part C open-ended questions. 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.

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. Complete sentences are *not* required. Phrases, diagrams, and symbols may be used. In the student's answer 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. 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, and Part C on the appropriate lines in the box printed on the answer booklet and then should add these four scores and enter the total in the box labeled "Total Written Test 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/apda/> on Wednesday, June 22, 2011. The student's scale score should be entered in the labeled box on the student's answer booklet. The scale score is the student's final examination score. On the front of the student's answer booklet, raters must enter their initials on the lines next to "Rater 1" or "Rater 2."

Beginning in June 2011, schools are no longer 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 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

Allow a total of 15 credits for this part. The student must answer all questions in this part.

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

A U-235 atom has 92 protons and 143 neutrons, and a U-238 atom has 92 protons and 146 neutrons.

A U-235 atom and a U-238 atom have the same number of protons but a different number of neutrons.

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

When electrons in an excited state return to a lower energy state, specific amounts of energy are emitted. These energies are associated with specific wavelengths of light that are characteristic of the bright-line spectrum of an element.

Energy is emitted when excited electrons fall back to lower shells.

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

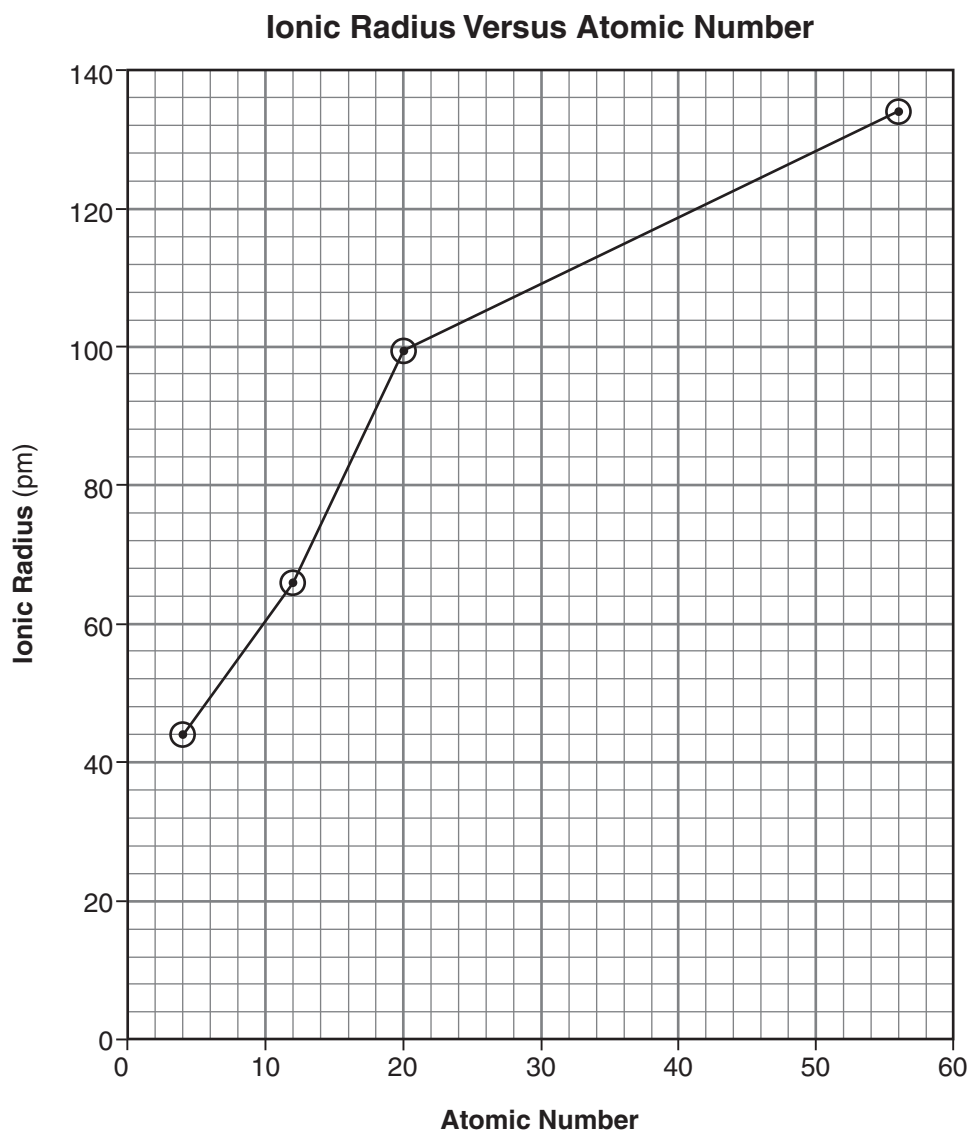
lithium and strontium

Sr and Li

54 [1] Allow 1 credit for 2 *or* two.

- 55 [1] Allow 1 credit for marking an appropriate scale. An appropriate scale is linear and allows a trend to be seen.
- 56 [1] Allow 1 credit for plotting all four points correctly ± 0.3 grid space. Plotted points do *not* need to be circled or connected.

Example of a 2-credit response for questions 55 and 56:



- 57 [1] Allow 1 credit for $117 \text{ pm} \pm 2 \text{ pm}$ *or* for a response consistent with the student's graph.
- 58 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

As the atomic number of elements in Group 2 increases, the ionic radius increases.

The ionic radius increases.

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

The valence electron shell of a Group 2 atom is lost when it becomes an ion.

A Group 2 ion has two fewer electrons than the atom from which it was formed.

60 [1] Allow 1 credit for +5.

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

The gaseous product is more disordered than the solid reactant.

The solid reactant is more ordered than the products.

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

-0.27 mol/L

0.27 mol/L

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

Between time t_1 and time t_2 , the concentrations of the reactants and the concentrations of the products are no longer changing.

The concentrations of the reactants and the products remain constant.

The concentration of each reactant is 0.73 mol/L, and the concentration of each product is 0.27 mol/L.

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

addition

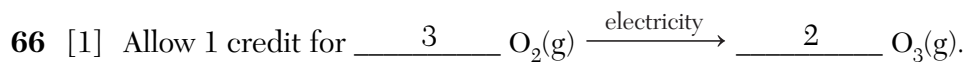
halogenation

bromination

65 [1] Allow 1 credit for alkene *or* alkenes.

Part C

Allow a total of 20 credits for this part. The student must answer all questions in this part.



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

nonpolar covalent

covalent

double covalent

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

Both atoms in an O_2 molecule have achieved a noble gas electron configuration.

An oxygen atom does not have a stable octet of valence electrons.

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

fractional distillation

distillation

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

<u>methane</u>	<u>ethane</u>	<u>propane</u>	<u>butane</u>
Weakest intermolecular forces			Strongest intermolecular forces
<u>CH₄</u>	<u>C₂H₆</u>	<u>C₃H₈</u>	<u>C₄H₁₀</u>
Weakest intermolecular forces			Strongest intermolecular forces

71 [1] Allow 1 credit for NaHCO_3 or NH_4Cl .

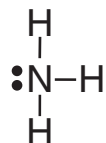
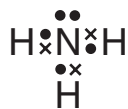
72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

The electronegativity difference is 1.4 for H and O, which is higher than the 0.9 for H and N.

The difference in electronegativity between hydrogen and oxygen is greater than that for hydrogen and nitrogen.

73 [1] Allow 1 credit.

Examples of 1-credit responses:



74 [1] Allow 1 credit for *two* acceptable responses.

Mixture 1: homogeneous

Mixture 2: heterogeneous

75 [1] Allow 1 credit for 2.02 cm^3 . Significant figures do *not* need to be shown.

76 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Heat mixture 1 until all the water evaporates.

Allow the water to evaporate.

77 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

The solution is no longer blue green.

A reddish-brown solid is formed.

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

Heat the solution before adding the aluminum foil.

Increase the concentration of the CuCl_2 solution.

Cut the Al foil into even smaller pieces.

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

Thoroughly wash the lab equipment and return it to its proper storage place.

Dispose of the chemicals as directed by the teacher.

Wash hands before leaving the lab room.

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

The beverage is acidic because its pH value is below 7.

A pH of 3 is in the acid range on the pH scale.

81 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

bromthymol blue

bromcresol green

thymol blue

82 [1] Allow 1 credit for 6 *or* six.

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

Polonium-210 is used to eliminate static electricity in machinery.
removes dust from camera lenses

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



lead-206

85 [1] Allow 1 credit for 3.5 mg.

Regents Examination in Physical Setting/Chemistry

June 2011

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

The *Chart for Determining the Final Examination Score for the June 2011 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site at: <http://www.p12.nysed.gov/apda/> on Wednesday, June 22, 2011. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Chemistry 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 2011 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		48, 55, 56, 57	
Math Key Idea 2		36, 62	66
Math Key Idea 3		34, 38, 43, 60	75, 85
Science Inquiry Key Idea 1		31, 49, 52, 53, 54, 58, 59, 61	67, 68, 72, 73
Science Inquiry Key Idea 2		42	78, 79
Science Inquiry Key Idea 3		34, 35, 37, 40, 41, 42, 45, 47, 50, 53, 58, 60	66, 68, 69, 70, 71, 74, 77, 81
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			83
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1			
Key Idea 2			
Key Idea 3			82
Key Idea 4		63	
Key Idea 5			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		32, 33, 35, 36, 37, 39, 41, 43, 46, 51, 53, 58, 61, 62, 63, 64, 65	66, 69, 76, 80, 81
Key Idea 4		44	83, 84, 85
Key idea 5		45	70, 73
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 7, 9, 12, 13, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30	31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 63, 64, 65	66, 69, 74, 75, 76, 77, 78, 79, 80, 81, 82
Key Idea 4	14, 17	40, 44, 50	83, 84, 85
Key Idea 5	8, 10, 11, 29	45, 49, 59	67, 68, 70, 71, 72, 73
Reference Tables			
2002 Edition	2, 3, 5, 6, 9, 11, 21, 30	32, 33, 36, 38, 43, 44, 45, 48, 50, 54, 59, 60	68, 71, 72, 73, 80, 81, 85