

FOR TEACHERS ONLY

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

P.S.–CH PHYSICAL SETTING/CHEMISTRY

Wednesday, June 20, 2012 — 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			
1 4	9 3	17 3	25 3
2 1	10 2	18 4	26 4
3 1	11 2	19 4	27 4
4 3	12 3	20 1	28 3
5 3	13 1	21 2	29 1
6 2	14 1	22 4	30 2
7 4	15 3	23 4	
8 1	16 1	24 4	
Part B-1			
31 4	36 4	41 1	46 2
32 4	37 3	42 3	47 3
33 1	38 3	43 1	48 1
34 2	39 4	44 2	49 3
35 2	40 2	45 2	50 2

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Physical Setting/Chemistry. 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.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the Part B–2 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 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. 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/apda/> on Wednesday, June 20, 2012. 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

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

51 [1] Allow 1 credit for $84 \text{ g} \pm 2 \text{ g}$.

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

single replacement

redox

53 [1] Allow 1 credit for $\underline{2} \text{ Al(s)} + \underline{3} \text{ CuSO}_4\text{(aq)} \rightarrow \underline{\hspace{1cm}} \text{ Al}_2\text{(SO}_4\text{)}_3\text{(aq)} + \underline{3} \text{ Cu(s)}$.

Allow credit even if the coefficient “1” is written in front of $\text{Al}_2\text{(SO}_4\text{)}_3\text{(aq)}$.

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

The products are different substances with different properties from the reactants.

There is a loss and gain of electrons by substances in the reaction.

55 [1] Allow 1 credit for 3.81 g.

56 [1] Allow 1 credit for NaNO_3 .

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

$(85 \text{ g/mol})(1.4 \text{ mol})$

$(1.4)(85)$

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

At standard pressure, the boiling point of the solution is higher than the boiling point of H_2O .

Water boils at a lower temperature.

59 [1] Allow 1 credit for 0.70 M. Significant figures do *not* need to be shown.

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

The solution can conduct an electric current better than the white solid.

The $\text{Ca}(\text{OH})_2(\text{aq})$ is a good conductor and $\text{Ca}(\text{OH})_2(\text{s})$ is not.

61 [1] Allow 1 credit for calcium hydroxide.

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

Increase the temperature of the water.

Increase the surface area of $\text{Ca}(\text{s})$.

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

$\text{H}_2\text{O}(\ell)$ and $\text{KCl}(\text{aq})$

KCl and HOH

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

The number of moles of $\text{H}^+(\text{aq})$ ions equals the number of moles of $\text{OH}^-(\text{aq})$ ions.

The number of hydrogen ions is the same as the number of hydroxide ions.

65 [1] Allow 1 credit for 0.17 M. Significant figures do *not* need to be shown.

Part C

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

66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



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

Dalton's drawing did not include the element hydrogen.

He perceived 5 sulfur atoms, but the formula actually has 2 sulfur atoms.

Dalton's drawing had more aluminum.

It did not include water.

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

$$\frac{12(2 \text{ g/mol} + 16 \text{ g/mol})}{474 \text{ g/mol}} \times 100$$

$$\frac{216}{474} \times 100$$

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

Room temperature is above the melting point and below the boiling point of H_2O_2 .

Room temperature is between -0.4°C and 151°C .

$$-0.4^\circ\text{C} < \text{room temperature} < 151^\circ\text{C}$$

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

More energy is released than absorbed.

Heat is a product of the reaction.

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

The excess pressure due to the production of oxygen gas in the bottle needs to be gradually released.

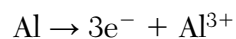
As $O_2(g)$ is produced, the pressure inside of the bottle might increase and the bottle might burst without the pressure-releasing cap.

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

Electrons flow from the Al electrode to the Ni electrode.

Electrons move left to right through the wire.

73 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



74 [1] Allow 1 credit for 6.0 mol. Significant figures do *not* need to be shown.

75 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

A spontaneous reaction converts chemical energy to electrical energy.

A battery is not required to provide energy for the cell to operate.

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

stomach

the organ with a pH of 2

77 [1] Allow 1 credit for yellow.

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

The lipase provides an alternate reaction pathway that requires less energy.

lower activation energy

79 [1] Allow 1 credit for saponification.

80 [1] Allow 1 credit for ester *or* esters.

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

covalent bonds and ionic bonds

polar and nonpolar

single and double

82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

The nuclides used for fusion have smaller atomic masses than nuclides used for fission.

The nuclides used in fission are many times more massive.

Fusion particles are lighter.

83 [1] Allow 1 credit for the correct number of protons and the correct number of neutrons for *both* hydrogen nuclides.

Example of a 1-credit response:

Nuclide	Total Number of Protons	Total Number of Neutrons
${}^1_1\text{H}$	1	0
${}^3_1\text{H}$	1	2

84 [1] Allow 1 credit for ${}^1_0\text{n}$.

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

Fusion produces more energy per gram of reactant.

The fusion process produces less radioactive waste.

The fusion reactant material is more readily available.

Regents Examination in Physical Setting/Chemistry

June 2012

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

The *Chart for Determining the Final Examination Score for the June 2012 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 20, 2012. 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 2012 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		51, 65	68
Math Key Idea 2		36, 46, 64	
Math Key Idea 3		33, 37, 39, 42, 49, 55, 56, 59, 65	68, 74, 84
Science Inquiry Key Idea 1		36, 46, 48, 54, 58, 60	69, 70, 71, 75, 78
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3		39, 41, 42, 47, 48, 49, 50, 51, 56, 58, 61	66, 72, 76, 81
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1			
Key Idea 2		50	67
Key Idea 3			76
Key Idea 4			
Key Idea 5		35, 41	
Standard 7			
Key Idea 1			71, 85
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		31, 32, 33, 34, 35, 36, 37, 38, 43, 45, 46, 49, 51, 52, 53, 54, 55, 57, 59, 62, 63, 65	71, 72, 73, 74, 75, 77, 79, 80, 83
Key Idea 4		40, 44	70, 82, 84, 85
Key idea 5		41, 60	81
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 7, 9, 10, 12, 18, 19, 20, 21, 24, 26, 27, 28, 29	31, 32, 33, 34, 35, 36, 37, 43, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65	67, 68, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 83
Key Idea 4	22, 23, 25	40, 42, 44	69, 70, 82, 84, 85
Key Idea 5	8, 11, 13, 14, 15, 16, 17, 30	38, 39, 41, 50	66, 81
Reference Tables			
2011 Edition		32, 34, 35, 38, 41, 42, 43, 45, 46, 47, 49, 50, 51, 56, 61, 63, 64, 65	66, 68, 72, 77, 80