

# FOR TEACHERS ONLY

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

## P.S.–CH PHYSICAL SETTING/CHEMISTRY

Tuesday, June 18, 2013 — 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.

**Part A and Part B-1**

Allow 1 credit for each correct response.

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

## 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. 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 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. 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 Tuesday, June 18, 2013. 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.



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

Energy is needed to break the bonds in O<sub>2</sub>.

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

The potential energy remains the same, but the average kinetic energy of the H<sub>2</sub>O molecules increases.

There is no change in potential energy. There is an increase in the average kinetic energy.

**58** [1] Allow 1 credit for  $8 \text{ kJ} \pm 1 \text{ kJ}$ .

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

The heat of vaporization of water is 2260 J/g and the heat of fusion for water is only 334 J/g.

The heat of fusion of water is much less than its heat of vaporization.

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

The number of gas molecules in cylinder A is the same as the number of gas molecules in cylinder B.

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

Temperature: above 293 K

Pressure: below 1.2 atm

Temperature: higher

Pressure: lower

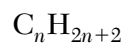
**62** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

$$\frac{(1.2 \text{ atm})(1.25 \text{ L})}{293 \text{ K}} = \frac{(1.0 \text{ atm})(V_2)}{273 \text{ K}}$$

$$\frac{(273)(1.2)(1.25)}{293}$$

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

alkanes



**64** [1] Allow 1 credit for  $C_3H_7$ . The order of the elements can vary.

**65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Isomer 2 boils at a lower temperature because it has weaker intermolecular forces than isomer 1.

The intermolecular forces in isomer 1 are stronger.

## 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:

increasing atomic mass

atomic mass

oxide formulas

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

three electrons

three

3

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

Ag

silver

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

Since the Group 18 elements tend not to react with other elements, there were no oxide compounds for Mendeleev to study.

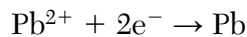
Group 18 elements are generally unreactive.

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

From 0 to +1

From zero to one

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



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

The glass tube is not a closed system.

Gases are entering and leaving the system.

The reaction is *not* reversible under these conditions.

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

Increase the temperature.

Increase the concentration of the hydrogen gas in the tube.

Grind the metal oxide to increase its surface area.

74 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Both samples have the same chemical properties.

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

aluminum oxide

76 [1] Allow 1 credit for 933 K.

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

The density of the aluminum is greater than the density of the  $\text{Al}_2\text{O}_3$  and  $\text{Na}_3\text{AlF}_6$  mixture.

The density of  $\text{Al}(\ell)$  is greater.

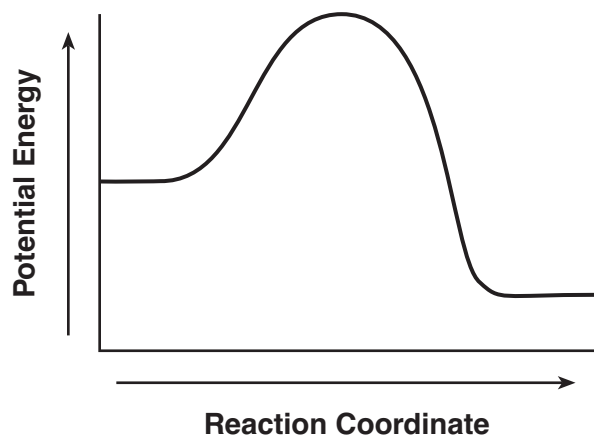
78 [1] Allow 1 credit for 197 kJ.

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



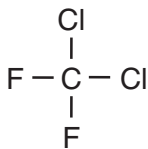
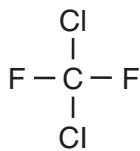
80 [1] Allow 1 credit.

**Example of a 1-credit response:**



81 [1] Allow 1 credit.

**Examples of 1-credit responses:**



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

halide

halocarbon

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

The polarity of sugar molecules is similar to the polarity of water molecules.

Both substances consist of polar molecules.

84 [1] Allow 1 credit for 70.1%. Significant figures do *not* need to be shown.

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

The boiling point of the mixture increases as water evaporates because the concentration of dissolved molecules increases.

An increase in the concentration of sugar particles increases the boiling point.



## Regents Examination in Physical Setting/Chemistry

June 2013

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

**The *Chart for Determining the Final Examination Score for the June 2013 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Tuesday, June 18, 2013. 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

<b>June 2013 Physical Setting/Chemistry</b>			
<b>Question Numbers</b>			
Key Ideas/Performance Indicators	Part A	Part B	Part C
<b>Standard 1</b>			
Math Key Idea 1		39, 62	
Math Key Idea 2		51, 58, 60	
Math Key Idea 3		32, 36, 40, 46, 49, 53, 62, 64	67, 70, 78, 79, 84
Science Inquiry Key Idea 1		33, 53, 54, 56, 59, 61, 63, 65	66, 68, 69, 72, 73, 74, 77, 83, 85
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3		37, 38, 47, 50, 51, 53, 56, 60, 65	67, 69, 70, 75, 79, 82, 85
Engineering Design Key Idea 1			
<b>Standard 2</b>			
Key Idea 1		47	76
Key Idea 2			81
<b>Standard 6</b>			
Key Idea 1			
Key Idea 2		34	
Key Idea 3		44	
Key Idea 4			
Key Idea 5			
<b>Standard 7</b>			
Key Idea 1			
Key Idea 2			
<b>Standard 4 Process Skills</b>			
Key Idea 3		31, 33, 34, 35, 39, 41, 42, 43, 45, 51, 55, 62, 63, 64	66, 67, 68, 71, 81, 83, 84
Key Idea 4		40, 48, 49, 57, 58, 59	78, 80, 82
Key Idea 5		52, 54, 65	
<b>Standard 4</b>			
Key Idea 3	1, 2, 3, 4, 5, 7, 8, 9, 11, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28	31, 32, 33, 34, 35, 36, 41, 42, 43, 44, 45, 46, 47, 51, 60, 61, 62, 63, 64	66, 67, 68, 70, 71, 72, 73, 74, 75, 76, 77, 79, 81, 82, 83, 84, 85
Key Idea 4	12, 13, 14, 29, 30	39, 40, 48, 49, 50, 57, 58, 59	78, 80
Key Idea 5	6, 10, 17	37, 38, 52, 53, 54, 55, 56, 65	69
<b>Reference Tables</b>			
2011 Edition	2, 7, 8, 10, 17, 22, 28, 30	33, 34, 36, 38, 39, 40, 45, 46, 47, 48, 52, 53, 55, 59, 62, 63	68, 69, 70, 71, 75, 76, 79, 81, 82, 84