

# FOR TEACHERS ONLY

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

# PS-CH

## PHYSICAL SETTING/CHEMISTRY

Thursday, August 13, 2009 — 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	
1 . . . . . <b>4</b> . . . . .	11 . . . . . <b>1</b> . . . . .	21 . . . . . <b>2</b> . . . . .	31 . . . . . <b>2</b> . . . . .	41 . . . . . <b>1</b> . . . . .
2 . . . . . <b>3</b> . . . . .	12 . . . . . <b>2</b> . . . . .	22 . . . . . <b>1</b> . . . . .	32 . . . . . <b>4</b> . . . . .	42 . . . . . <b>3</b> . . . . .
3 . . . . . <b>1</b> . . . . .	13 . . . . . <b>4</b> . . . . .	23 . . . . . <b>3</b> . . . . .	33 . . . . . <b>2</b> . . . . .	43 . . . . . <b>3</b> . . . . .
4 . . . . . <b>1</b> . . . . .	14 . . . . . <b>1</b> . . . . .	24 . . . . . <b>3</b> . . . . .	34 . . . . . <b>4</b> . . . . .	44 . . . . . <b>4</b> . . . . .
5 . . . . . <b>3</b> . . . . .	15 . . . . . <b>2</b> . . . . .	25 . . . . . <b>4</b> . . . . .	35 . . . . . <b>1</b> . . . . .	45 . . . . . <b>3</b> . . . . .
6 . . . . . <b>3</b> . . . . .	16 . . . . . <b>2</b> . . . . .	26 . . . . . <b>2</b> . . . . .	36 . . . . . <b>2</b> . . . . .	46 . . . . . <b>1</b> . . . . .
7 . . . . . <b>4</b> . . . . .	17 . . . . . <b>1</b> . . . . .	27 . . . . . <b>3</b> . . . . .	37 . . . . . <b>4</b> . . . . .	47 . . . . . <b>1</b> . . . . .
8 . . . . . <b>2</b> . . . . .	18 . . . . . <b>3</b> . . . . .	28 . . . . . <b>2</b> . . . . .	38 . . . . . <b>4</b> . . . . .	48 . . . . . <b>3</b> . . . . .
9 . . . . . <b>1</b> . . . . .	19 . . . . . <b>4</b> . . . . .	29 . . . . . <b>4</b> . . . . .	39 . . . . . <b>3</b> . . . . .	49 . . . . . <b>2</b> . . . . .
10 . . . . . <b>1</b> . . . . .	20 . . . . . <b>3</b> . . . . .	30 . . . . . <b>2</b> . . . . .	40 . . . . . <b>4</b> . . . . .	50 . . . . . <b>2</b> . . . . .



**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.

On the detachable answer sheet 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 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. 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 scaled score by using the conversion chart that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Thursday, August 13, 2009. 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.

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**

**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:

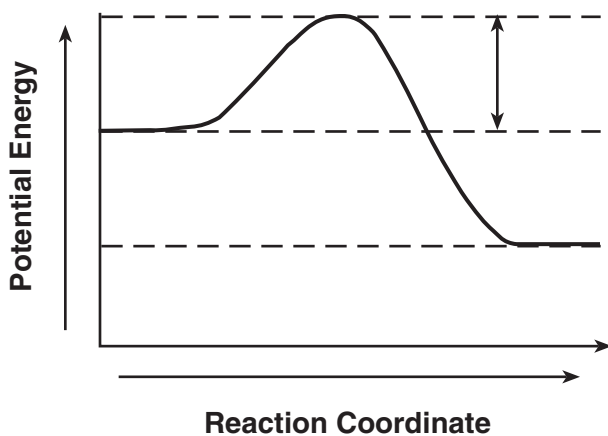
Na  
sodium  
element 11

**52** [1] Allow 1 credit. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

28 mol

**53** [1] Allow 1 credit.

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



**54** [3] Allow a maximum of 3 credits, allocated as follows:

- Allow 1 credit for stating that an electron has a negative charge.
- Allow 1 credit for stating that electrons are located in orbitals or regions of most probable location.
- Allow 1 credit for stating that a carbon atom has six electrons.

- 55** [1] Allow 1 credit. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

438 g

437.8 g

- 56** [1] Allow 1 credit for  $\underline{\quad\quad}$  Zn(s) +  $\underline{2}$  HCl(aq)  $\rightarrow$   $\underline{\quad\quad}$  H<sub>2</sub>(g) +  $\underline{\quad\quad}$  ZnCl<sub>2</sub>(aq).

Allow credit even if the coefficient “1” is written in front of Zn(s), H<sub>2</sub>(g), and/or ZnCl<sub>2</sub>(aq).

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

The product ZnCl<sub>2</sub> is soluble in water.

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

The greater surface area in powdered zinc would have resulted in more frequent collisions between the zinc atoms and the hydrogen ions in the HCl(aq).

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

The structural formula for methanamine shows electrons being shared, so the bond is covalent.

Electrons are shared in the bond.

covalent bonding due to shared electrons

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

Ne

neon

element 10

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

As the number of shared electrons in a carbon-nitrogen bond increases, the bond energy increases.

Less energy is required to break a single carbon-nitrogen bond than to break a triple carbon-nitrogen bond.

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

The molecule has an asymmetrical charge distribution.

The molecule has an unequal distribution of charge.

**63** [1] Allow 1 credit. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

230 ppm

$2.31 \times 10^2$  ppm

**Part C**

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

**64** [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for a correct numerical setup. Acceptable responses include, but are not limited to:

$$\frac{322 \text{ J/g} - 334 \text{ J/g}}{334 \text{ J/g}} \times 100$$

$$\frac{12}{334} \times 100$$

- Allow 1 credit for a correct response *or* for a response consistent with the student's numerical setup. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

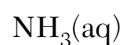
–3.6%

4%

**Note:** Do *not* allow credit for a numerical setup and calculated result that are not related to the concept assessed by the question.

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

household ammonia



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

Because litmus changes color in a pH range of 5.5 to 8.2, litmus cannot be used to differentiate between a pH of 3.3 and 4.3.

Litmus is red for all pH values below 5.5.

**67** [1] Allow 1 credit for lemon juice.

**68** [1] Allow 1 credit for methanol *or* methyl alcohol.

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

With only one carbon atom bonded to one oxygen atom, there can be no rings or chains with branches in the molecular structure.

There are too few atoms to create a different molecular structure.

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

ester

esters

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

combustion

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

The balanced equation shows energy as a product of the reaction.

Energy is on the right side of the arrow.

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

The oxidation number of  $\text{Cu}^{2+}$  changes to 0.

Iron's oxidation state changes from zero to +2.

Oxidation numbers change during the reaction because electrons are transferred.

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

electrons

$e^-$

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





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

Zinc is more reactive than iron, and iron is more reactive than copper.

The order of decreasing activity is Zn, Fe, Cu.

Copper is least active and zinc is most active.

77 [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for a correct numerical setup. Acceptable responses include, but are not limited to:

$$d = \frac{m}{V} = \frac{129.5 \text{ g}}{14.8 \text{ cm}^3}$$

$$\frac{129.5}{14.8}$$

- Allow 1 credit for  $8.75 \text{ g/cm}^3$  or for a response consistent with the student's numerical setup. Significant figures do *not* need to be shown.

**Note:** Do *not* allow credit for a numerical setup and calculated result that are not related to the concept assessed by the question.

78 [1] Allow 1 credit for  $1084^\circ\text{C}$ .

79 [1] Allow 1 credit. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

13.8 g

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

A deuteron has one neutron and a triton has two neutrons.

A deuteron has one fewer neutron than a triton.

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

fusion

thermonuclear fusion

## Regents Examination in Physical Setting/Chemistry

August 2009

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

**The *Chart for Determining the Final Examination Score for the August 2009 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Thursday, August 13, 2009. 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 [www.emsc.nysed.gov/osa/exameval](http://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

<b>August 2009 Physical Setting/Chemistry</b>			
<b>Question Numbers</b>			
Key Ideas	Part A	Part B	Part C
<b>Standard 1</b>			
Math Key Idea 1		40, 43	64, 69, 77
Math Key Idea 2		40, 44, 61	
Math Key Idea 3		36, 37, 48, 49, 52, 63	64, 77, 78, 79
Sci. Inquiry Key Idea 1		58, 59	69, 74, 76
Sci. Inquiry Key Idea 2			
Sci. Inquiry Key Idea 3		31, 32, 33, 34, 37, 42, 46, 48, 51, 57, 62	65, 66, 67, 68, 70, 71, 72, 73, 77
Eng. Design Key Idea 1			
<b>Standard 2</b>			
Key Idea 1		34	78
Key Idea 2		63	
<b>Standard 6</b>			
Key Idea 1		39	
Key Idea 2		38, 42	64
Key Idea 3			65, 67
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, 32, 33, 35, 36, 40, 41, 45, 46, 47, 48, 49, 51, 52, 54, 55, 56, 58, 63	65, 66, 67, 70, 71, 75, 76, 80
Key Idea 4		50, 53	72, 81
Key Idea 5		38, 59, 60	
<b>Standard 4</b>			
Key Idea 3	1, 2, 3, 4, 6, 7, 8, 12, 13, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28	31, 32, 33, 34, 35, 36, 37, 40, 41, 42, 44, 45, 46, 47, 48, 49, 51, 52, 54, 55, 56, 57, 58, 63	65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80
Key Idea 4	18, 30	39, 43, 50, 53	64, 72, 81
Key Idea 5	5, 9, 10, 11, 14, 29	38, 59, 60, 61, 62	
<b>Reference Tables</b>			
2002 Edition	1, 2, 3, 7, 11, 12, 23, 30	31, 32, 33, 34, 36, 37, 38, 40, 43, 44, 46, 47, 48, 49, 50, 51, 55, 57, 59, 60, 63	64, 65, 66, 68, 70, 75, 77, 78

