

FOR TEACHERS ONLY

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

PS-CH

PHYSICAL SETTING/CHEMISTRY

Thursday, January 25, 2007 — 1:15 to 4:15 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 3	11 4	21 4	31 4	41 3
2 1	12 2	22 4	32 2	42 1
3 1	13 4	23 3	33 1	43 3
4 2	14 1	24 4	34 4	44 4
5 4	15 1	25 1	35 3	45 1
6 1	16 2	26 4	36 2	46 2
7 3	17 4	27 3	37 1	47 2
8 4	18 3	28 1	38 4	48 4
9 2	19 4	29 4	39 2	49 1
10 2	20 1	30 3	40 2	50 1

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 checkmark 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, January 25, 2007. 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 18 credits for this part. The student must answer all questions in this part.

51 [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for a correct numerical setup. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

$$(10.013)(0.199) + (11.009)(0.801)$$

$$\frac{(19.9)(10.013) + (80.1)(11.009)}{100}$$

$$(10.013)(19.9\%) + (11.009)(80.1\%)$$

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

10.8 atomic mass units

10.81 atomic mass units

10.8108 atomic mass units

or

Allow 1 credit for a response consistent with the student's numerical setup.

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

52 [1] Allow 1 credit for ZnCl₂.

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

Cu

Ag

gold

54 [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for a correct numerical setup. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

$$\frac{21.4\% - 20.9\%}{20.9\%} \times 100$$

$$\frac{21.4 - 20.9}{20.9} \times 100$$

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

2%

2.4%

2.39%

or

Allow 1 credit for a response consistent with the student's numerical setup.

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

55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

AQ₂

Q₂A

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

polar covalent

covalent

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

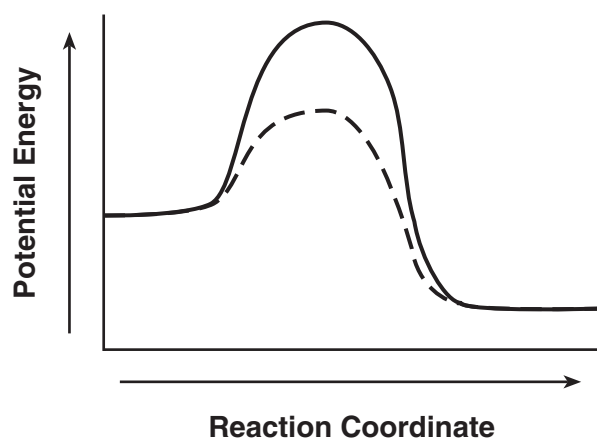
The total mass of reactants equals the total mass of product.

Mass of reactants equals mass of product.

Mass is conserved.

- 58 [1] Allow 1 credit for a correct response that shows an activation energy that is higher than the potential energy of the reactants and lower than the original activation energy.

Example of a 1-credit response:



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

As molecules acquire more kinetic energy, the number of effective collisions increases.

higher temperature, greater frequency of collisions

- 60 [1] Allow 1 credit for 0.300 g. Significant figures do *not* need to be shown.

- 61 [1] Allow 1 credit for $\underline{3} \text{ Cu}^{2+}(\text{aq}) + \underline{2} \text{ Al}(\text{s}) \rightarrow \underline{3} \text{ Cu}(\text{s}) + \underline{2} \text{ Al}^{3+}(\text{aq})$.

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

Aluminum atoms are losing electrons and becoming aluminum ions that are entering the solution.

- 63** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- It allows migration of ions.
 - maintains neutrality
 - prevents polarization
- 64** [1] Allow 1 credit for any *two* of the following responses:
- methyl orange
 - bromthymol blue
 - thymol blue
- 65** [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Methane is nonpolar because its molecules are symmetrical.
 - Charges are evenly distributed throughout the molecule.
- 66** [1] Allow 1 credit for $97^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

Part C

Allow a total of 17 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:

Group 18

noble gases

68 [1] Allow 1 credit for 173.

69 [1] Allow 1 credit for 118.

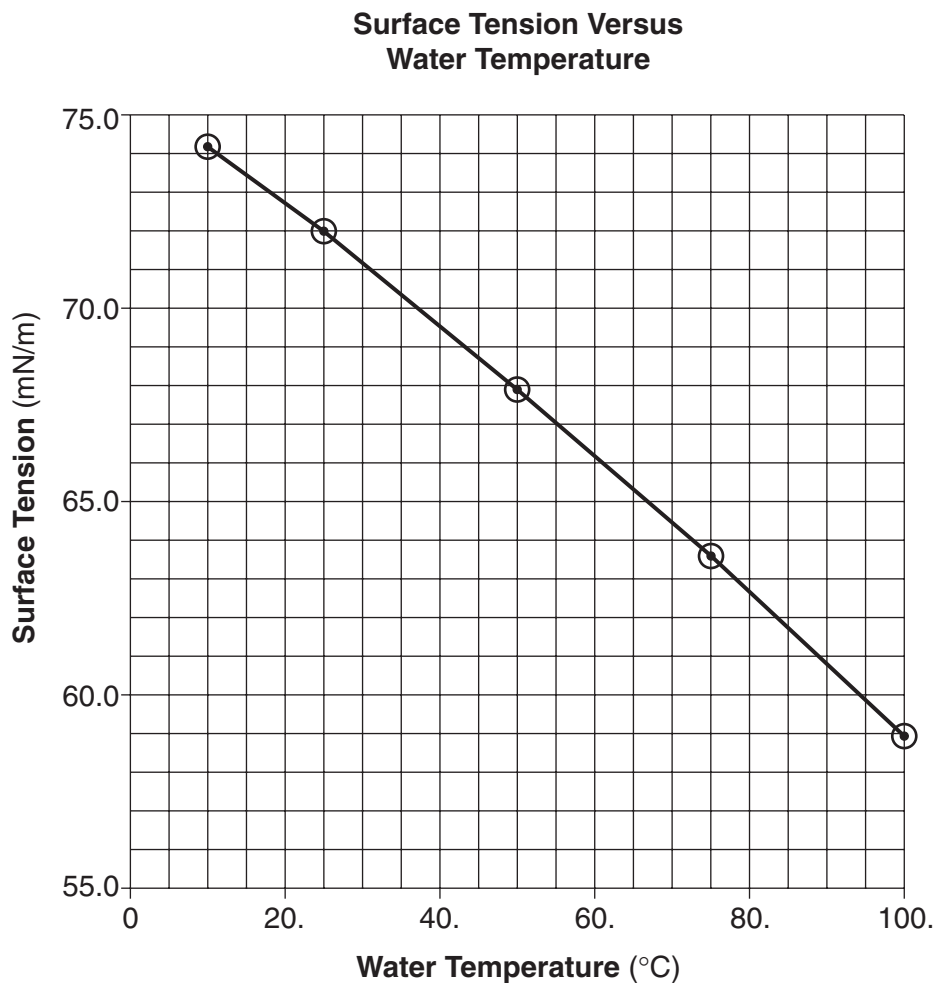
70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Reproducing results verifies that the results are valid.

reliability of results

- 71 [1] Allow 1 credit for correctly plotting all five points ± 0.3 grid space. Plotted points do *not* need to be circled or connected.

Example of a 1-credit response:



- 72 [1] Allow 1 credit for 66.1 mN/m ± 0.3 mN/m. Significant figures do *not* need to be shown.

or

Allow 1 credit for a response consistent with the student's graph in question 71.

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

Surface tension will decrease as temperature increases.

as temperature \uparrow , surface tension \downarrow

Note: Do *not* allow credit for “inverse relationship.”

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

Tetrachloromethane, CCl_4 , has weaker intermolecular forces than water, H_2O .

Surface tension of water at 25°C is greater than 26.3 mN/m , so the intermolecular forces of water are stronger.

The forces between water molecules are greater.

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

0.1250 L

0.125 L

$1.25 \times 10^{-1} \text{ L}$

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

$$V_2 = \frac{(1.0 \text{ atm})(125.0 \text{ mL})}{1.5 \text{ atm}}$$

$$(1.0)(125) = (1.5)(V_2)$$

or

Allow 1 credit for a response consistent with the student's answer to question 75.

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

Both samples have the same number of particles.

Equal volumes of gases at the same temperature and pressure contain the same number of particles.

- 78** [1] Allow 1 credit for hydrochloric acid.

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

0.833 M

8.3×10^{-1} M

- 80** [1] Allow 1 credit for 3 or three.

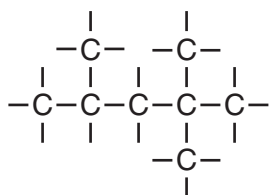
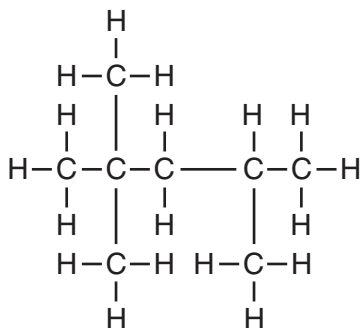
- 81** [1] Allow 1 credit. Acceptable responses include, but are not limited to:

wearing gloves

no open-toed shoes

- 82** [1] Allow 1 credit.

Examples of a 1-credit response:



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

The arrangement of molecules in the vapor state are more random or disordered.

Particles in the vapor state are farther apart and move more freely.

Regents Examination in Physical Setting/Chemistry

January 2007

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

The *Chart for Determining the Final Examination Score for the January 2007 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Thursday, January 25, 2007. 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.

Submitting 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.
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

January 2007 Physical Setting/ Chemistry			
Question Numbers			
Key Ideas	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		35, 54	71, 75, 76, 80
Math Key Idea 2			72, 73
Math Key Idea 3		45, 51, 52, 54	
Sci. Inq. Key Idea 1		37, 62, 63, 65	77, 83
Sci. Inq. Key Idea 2			81
Sci. Inq. Key Idea 3		34, 38, 41, 47, 55, 56, 58, 62	70, 74, 78
Eng. Des. Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1			
Key Idea 2		58	
Key Idea 3		48	75
Key Idea 4			
Key Idea 5		66	
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		31, 32, 33, 34, 35, 36, 39, 40, 41, 43, 44, 46, 47, 51, 52, 53, 55, 57, 59, 60, 61, 63, 64	67, 68, 69, 76, 79, 80, 82, 83
Key Idea 4		42, 49, 50, 58	
Key Idea 5		37, 56	
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30	31, 32, 33, 34, 35, 36, 38, 40, 41, 43, 44, 45, 46, 47, 48, 51, 52, 53, 54, 55, 57, 59, 60, 61, 62, 63, 64	67, 68, 69, 70, 75, 76, 77, 78, 79, 80, 81, 82, 83
Key Idea 4		39, 42, 49, 58	
Key Idea 5	9, 12, 14, 15, 16, 28, 29	37, 50, 56, 65, 66	71, 72, 73, 74
Reference Tables			
2002 Edition	2, 5, 6, 7, 8, 11, 12, 13, 17, 20, 22, 23, 24, 26, 30	32, 33, 34, 35, 37, 38, 39, 40, 42, 45, 46, 47, 49, 50, 52, 53, 54, 60, 62, 64, 65, 66	67, 68, 69, 75, 76, 78, 79, 80, 82

