

FOR TEACHERS ONLY

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

PS-CH

PHYSICAL SETTING/CHEMISTRY

Thursday, January 24, 2008 — 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 1	11 4	21 1	31 4	41 1
2 2	12 3	22 2	32 1	42 2
3 3	13 3	23 1	33 4	43 1
4 2	14 1	24 3	34 4	44 3
5 2	15 3	25 4	35 2	45 2
6 4	16 4	26 4	36 2	46 4
7 1	17 2	27 1	37 1	47 2
8 4	18 3	28 1	38 2	48 4
9 3	19 2	29 1	39 2	49 4
10 3	20 3	30 4	40 2	50 2

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, January 24, 2008. 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:

form 1^+ ions

react vigorously with water

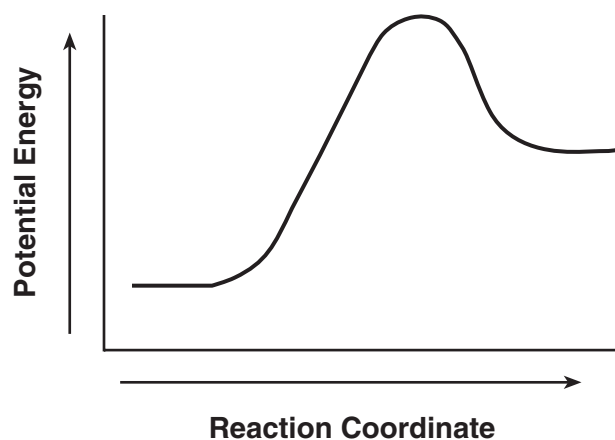
easily lose one electron

form ionic bonds with nonmetals

form halides with the general formula MX

52 [1] Allow 1 credit.

Example of a 1-credit response:



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

2–7–4–1

2–7–5

2–8–3–1

1–8–5

Note: Do *not* allow credit for 2–8–4.

54 [1] Allow 1 credit for C_4H_9 .

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

The electron-shell diagram shows the total number of protons and the total number of neutrons in an atom.

shows number of electrons in each inner shell

shows total number of protons in an atom

shows the number of electron shells

56 [1] Allow 1 credit for 23.

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

Lewis electron-dot diagrams only show valence electrons, which are involved in bonding.

shows only electrons involved in bonding

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

801°C to 1465°C

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

AB

CD

60 [1] Allow 1 credit for *CD*.

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

The rate of the forward reaction equals the rate of the reverse reaction.

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

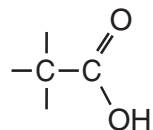
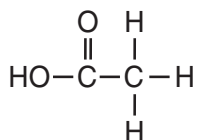
The $\text{H}^+(\text{aq})$ concentration increases.

$[\text{H}_3\text{O}^+]$ increases.

Concentration increases.

- 63 [1] Allow 1 credit.

Examples of 1-credit responses:



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

The solubility of $\text{KNO}_3(\text{s})$ is not affected by an increase in pressure.

When the pressure on the solution increases, the solubility of KNO_3 remains the same.

- 65 [1] Allow 1 credit for $62 \text{ g} \pm 2 \text{ g}$.

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:

alcohol

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

Water and 1,2-ethanediol molecules are both polar.

Both molecules have similar polarity.

- 68** [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:

$$\frac{6690 \text{ g}}{62.0 \text{ g/mol}}$$

$$\frac{6690}{62}$$

- Allow 1 credit for 108 mol *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.

- 69** [1] Allow 1 credit for $\underline{3} \text{ S(s)} + \underline{2} \text{ KClO}_3\text{(s)} \rightarrow \underline{3} \text{ SO}_2\text{(g)} + \underline{2} \text{ KCl(s)} + \text{energy}$.

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

The activation energy results from striking the balls together.

heat produced as the balls collide

mechanical energy

friction

- 71 [1] Allow 1 credit for +5.
- 72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Methanol does not conduct an electric current.
- Bromthymol blue tests blue in a base and yellow in an acid, so bottle *B* must be methanol.
- Bromthymol blue would be green in methanol because methanol is not an acid or a base.
- 73 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- Test: bromthymol blue
Test result: yellow
- Test: reactivity with Mg
Test result: reaction
- 74 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- All three solutions have a pH greater than 4.4.
- Methyl orange changes to yellow at a pH of 4.4, which is still in the acid range.
- A solution with a pH greater than 4.4 could be acidic, basic, or neutral.
- 75 [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:
$$q = mC\Delta T = (100.0 \text{ g})(4.18 \text{ J/g}\cdot^\circ\text{C})(57.0^\circ\text{C} - 22.0^\circ\text{C})$$
$$(100)(4.18)(35)$$
 - Allow 1 credit for 14 600 J *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.
- 76 [1] Allow 1 credit for –14% *or* 14%. Significant figures do *not* need to be shown.

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

$$\frac{12}{(2 \times 23) + 12 + (3 \times 16)} \times 100$$

$$\frac{12 \text{ g/mol}}{106 \text{ g/mol}} \times 100$$

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

decomposition

endothermic

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

3.5 mol

$3\frac{1}{2}$ mol

$\frac{7}{2}$ mol

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

melting

vaporization

solidification

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

The burning candle releases heat and light.

A cobalt chloride test indicates water is produced.

A limewater test indicates carbon dioxide gas is produced.

82 [1] Allow 1 credit for $124^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

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

As molar mass increases, there are stronger intermolecular forces.

The forces are greater between heavier molecules.

Regents Examination in Physical Setting/Chemistry

January 2008

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

The Chart for Determining the Final Examination Score for the January 2008 Regents Examination in Physical Setting/Chemistry will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Thursday, January 24, 2008. 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 2008 Physical Setting/Chemistry			
Question Numbers			
Key Ideas	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		38, 41, 46	68, 75, 76, 77, 82
Math Key Idea 2			
Math Key Idea 3		34, 43, 49, 54, 56, 58, 65	68, 69, 71, 79
Sci. Inquiry Key Idea 1		55, 57, 61, 64	70, 72, 80, 81
Sci. Inquiry Key Idea 2			
Sci. Inquiry Key Idea 3		35, 37, 39, 40, 47, 53, 65	66, 69, 71, 72, 73
Eng. Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1			
Key Idea 2		41	
Key Idea 3		48	
Key Idea 4		62	
Key Idea 5		64, 65	82, 83
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		31, 32, 33, 34, 38, 41, 42, 44, 45, 46, 47, 51, 53, 54, 55, 56, 61, 62, 63, 65	66, 67, 68, 69, 73, 74, 77, 78, 79, 80, 81
Key Idea 4		49, 50, 52, 58, 59, 60	70, 75
Key Idea 5		36, 57	83
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 29	31, 32, 33, 34, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 51, 53, 54, 55, 56, 61, 62, 63, 64, 65	66, 67, 68, 69, 71, 72, 73, 74, 77, 78, 79, 80, 81, 82
Key Idea 4	20, 28, 30	40, 49, 50, 52, 58, 59	70, 75, 76
Key Idea 5	10, 11, 12, 26	35, 36, 57, 60	83
Reference Tables			
2002 Edition	2, 3, 6, 8, 14, 15, 19, 22, 25, 27, 28	34, 35, 36, 37, 38, 40, 41, 42, 43, 46, 47, 49, 50, 51, 53, 63, 64, 65	66, 71, 74, 75, 76, 77