FOR TEACHERS ONLY

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

PS–CH PHYSICAL SETTING/CHEMISTRY

Thursday, January 26, 2006 — 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. Visit the site http://www.emsc.nysed.gov/osa/ and select the link "Latest Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and at least one more time before the final scores for the examination are recorded.

Part A and Part B–1
Allow 1 credit for each correct response.

Part A

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

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 Administering and 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 26, 2006. 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 17 credits for this part. The student must answer all questions in this part.

51 [1] Allow 1 credit for 14.

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

An iodine atom has more electron shells than a fluorine atom.

A fluorine atom has fewer electron shells.

Note: Do *not* allow credit for a response indicating greater atomic number.

53 [1] Allow 1 credit. The correct symbol and six electrons must be shown. The location of single electrons and electron pairs may vary.

Example of a 1-credit response:

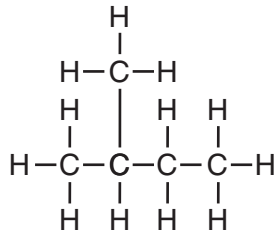
54 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

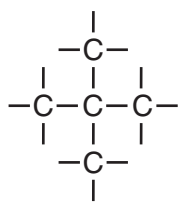
Electrons in liquid mercury are mobile.

valence electrons free to move and conduct electric current

55 [1] Allow 1 credit.

Examples of a 1-credit response:





56 [1] Allow 1 credit for $\frac{1}{32}$ or 0.03125. Significant figures do *not* need to be shown.

57 [1] Allow 1 credit for 1.24 mol. Significant figures do *not* need to be shown.

58 [1] Allow 1 credit for 1250 J. Significant figures do *not* need to be shown.

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

An increase in temperature favors the endothermic reaction, which produces more $SO_2(g)$.

The reaction shifts to the left, increasing the concentration of $SO_2(g)$.

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

A higher concentration of $O_2(g)$ causes more collisions and reactions with $SO_2(g)$ molecules, decreasing $SO_2(g)$ concentration.

More collisions between reactants shift the reaction to the right.

61 [1] Allow 1 credit for 3.61 g/L. Significant figures do *not* need to be shown.

62 [1] Allow 1 credit for 0.090 g/L or 9.0×10^{-2} g/L.

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

The electronegativity difference for HCl is 1.1, which is higher than the 0.6 for HI.

The difference for HCl is greater.

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

Hydrogen has weaker intermolecular forces than HBr.

hydrogen — weaker forces

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

HCl's molecular polarity is more similar to water's polarity than H_2's polarity compared to water's.

HCl and water both polar, H_2 nonpolar, like dissolves like

HCl polarity is more similar to water's polarity.

66 [1] Allow 1 credit for 50°C. Significant figures do *not* need to be shown.

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

$\overline{AB}$

from time 0 to 2 minutes

Part C

Allow a total of 18 credits for this part. The student must answer all questions in this part.

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

If the water temperature is higher, the tablet will dissolve at a faster rate.

higher temperature, less time to dissolve

lower rate in cold water

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

At higher temperatures the water molecules collide more often and more effectively with the tablet, so the tablet dissolves faster.

high temperature → more collisions → dissolves faster

or

Allow 1 credit for a response consistent with the student's answer to question 68.

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

crushing the tablet

stirring/shaking/agitating

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

The pH goes down because there are more hydronium ions in solution.

$[H_3O^+] \uparrow$

72 [1] Allow 1 credit for NO_3^- or NO_3^{1-} or NO_3^{-1} or OH^-.

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

There will be a decrease in the number of fish eggs that hatch.

fewer eggs produced

more deformities

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

As the water temperature increases, the solubility of sulfur dioxide decreases.

The solubility of SO_2 decreases.

75 [1] Allow 1 credit for 164 g/mol. Significant figures do *not* need to be shown.

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

$$0.250\ \text{L}\left(\frac{0.200\ \text{mol}}{1\ \text{L}}\right)$$

$$0.2 = \frac{x}{0.25}$$

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

mass of $Ca(NO_3)_2$

mass of solute

mass

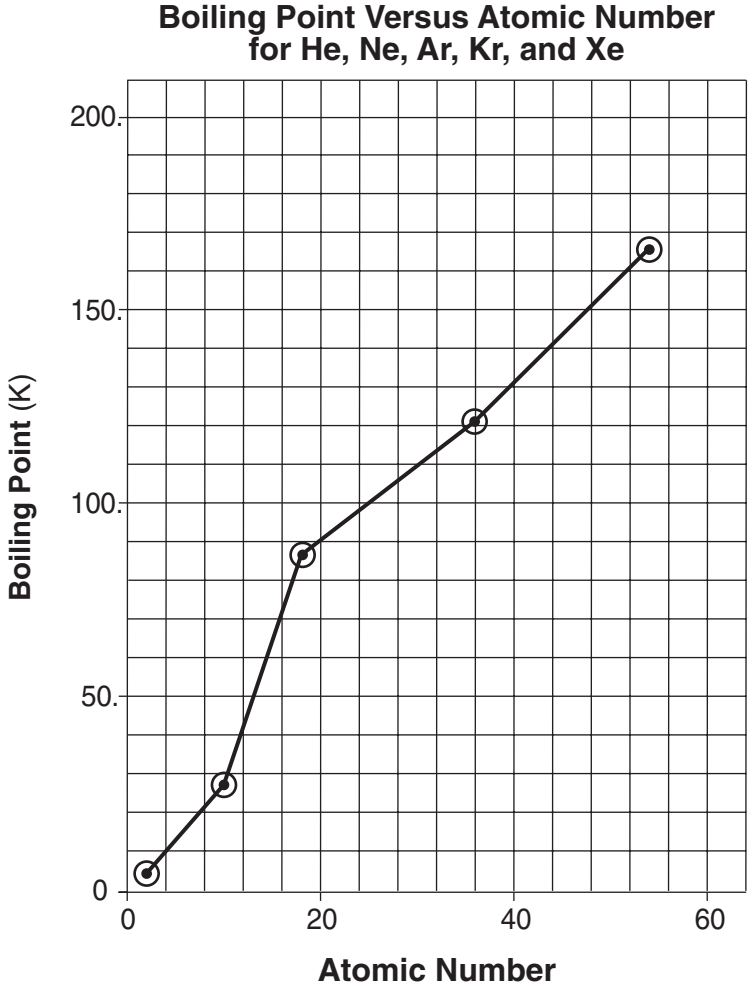
78 [1] Allow 1 credit for *all five* correctly listed boiling points shown below. Allow credit even if the degree sign is shown for the boiling points.

Data Table

Symbol	**Atomic Number**	**Boiling Point** (K)
He	2	4
Ne	10	27
Ar	18	87
Kr	36	121
Xe	54	166

79 [1] Allow 1 credit for plotting all the points correctly (±0.3 grid space). Plotted points do *not* need to be circled or connected.

Example of a 1-credit response:



or

Allow 1 credit for a response consistent with the student's answer to question 78.

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

As atomic number increases, boiling point increases.

or

Allow 1 credit for a response consistent with the student's graph in question 79.

or

Allow 1 credit for a response consistent with the student's data in question 78.

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

$$\frac{75 \text{ kPa}}{295 \text{ K}} = \frac{x}{418 \text{ K}}$$

$$P_2 = \frac{(75)(418)}{295}$$

82 [1] Allow 1 credit for 145°C.

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

Copper is less reactive than iron.

Cu below H_2 on Table *J*

84 [1] Allow 1 credit for electrolytic or electrolysis.

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

ions

charged particles

H_3O^+

SO_4^{2-}

The *Chart for Determining the Final Examination Score for the January 2006 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Thursday, January 26, 2006. 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.

Map to Core Curriculum

January 2006 Physical Setting/ Chemistry			
Question Numbers			
Key Ideas	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		39,43,48,56,57,58, 61,62,64	76,77,79,81,82
Math Key Idea 2		34,35	80
Math Key Idea 3		33,51,61	69,70,75
Sci. Inq. Key Idea 1		52,59,60	71,85
Sci. Inq. Key Idea 2			
Sci. Inq. Key Idea 3		31,41,47,63,66,67	68,72,78,83,84
Eng. Des. Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			73
Standard 6			
Key Idea 1			
Key Idea 2		32,36,49,53,55	
Key Idea 3			
Key Idea 4		41	
Key Idea 5			80
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		34,35,36,37,38,39, 41,42,44,45,46,47, 48,51,52,53,55,57, 59,65	69,74,75,76,77, 81,83,84
Key Idea 4		40,43,49,50,56,58, 66,67	82
Key Idea 5		54,63,64,65	
Standard 4			
Key Idea 3	1,2,3,4,5,6,7,8, 9,10,13,14,15, 17,18,20,21,22, 23,24,28,30	31,32,33,34,35,36, 37,38,39,41,42,44, 45,46,47,48,51,52, 55,57,59,60,61	68,69,70,71,72, 73,74,75,76,77, 78,80,81,83,84, 85
Key Idea 4	16,27	40,43,49,50,56,58, 66,67	
Key Idea 5	11,12,19,25,26, 29	53,54,63,64,65	
Reference Tables			
2002 Edition	3,6,7,8,12,19, 21,24,26,28	31,33,39,40,44,45, 47,48,49,51,52,53, 56,57,58,61,63	72,74,75,76,78, 81,82,83