FOR TEACHERS ONLY

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

PS–CH PHYSICAL SETTING/CHEMISTRY

Tuesday, August 17, 2004 — 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. 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	2	12	4	23	2		
2	4	13	3	24	3		
3	3	14	1	25	2		
4	1	15	2	26	2		
5	4	16	4	27	3		
6	3	17	2	28	2		
7	3	18	3	29	4		
8	4	19	4	30	3		
9	3	20	4	31	3		
10	3	21	1	32	2		
11	4	22	1	33	2		

Part B–1

34	3	43	2
35	3	44	4
36	1	45	2
37	1	46	2
38	3	47	1
39	3	48	2
40	3	49	3
41	4	50	3
42	3		

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 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 Tuesday, August 17, 2004. 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 in the scoring key for that administration be used to determine the student's final score. The chart in this scoring key is usable only for this administration of the examination.

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 for Group **13** and Period **4**.

52 [1] Allow 1 credit for **16** or **16.0**.

53 [1] Allow 1 credit for a correct numerical setup. Units do *not* need to be shown. Acceptable responses include, but are not limited to, these examples:

$$1.2\ \text{M} = \frac{0.50\ \text{mole}}{x}$$

$$1.2 = \frac{0.50}{x}$$

$$0.50\ \text{mol} \times \frac{1\ \text{L}}{1.2\ \text{mol}}$$

$$\frac{1.2\ \text{mole}}{1\ \text{L}} = \frac{.5\ \text{mole}}{x}$$

54 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

Both samples are at the same temperature.

Samples *B* and *C* are both at 273 K (or at 0°C).

both at STP

55 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

Sample *A* has only one type of molecule.

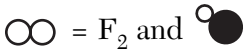
All particles are the same.

not a mixture

56 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

Sample *C* represents a diatomic element and a compound.

shows an element and a compound mixed

 = F_2 and = HCl

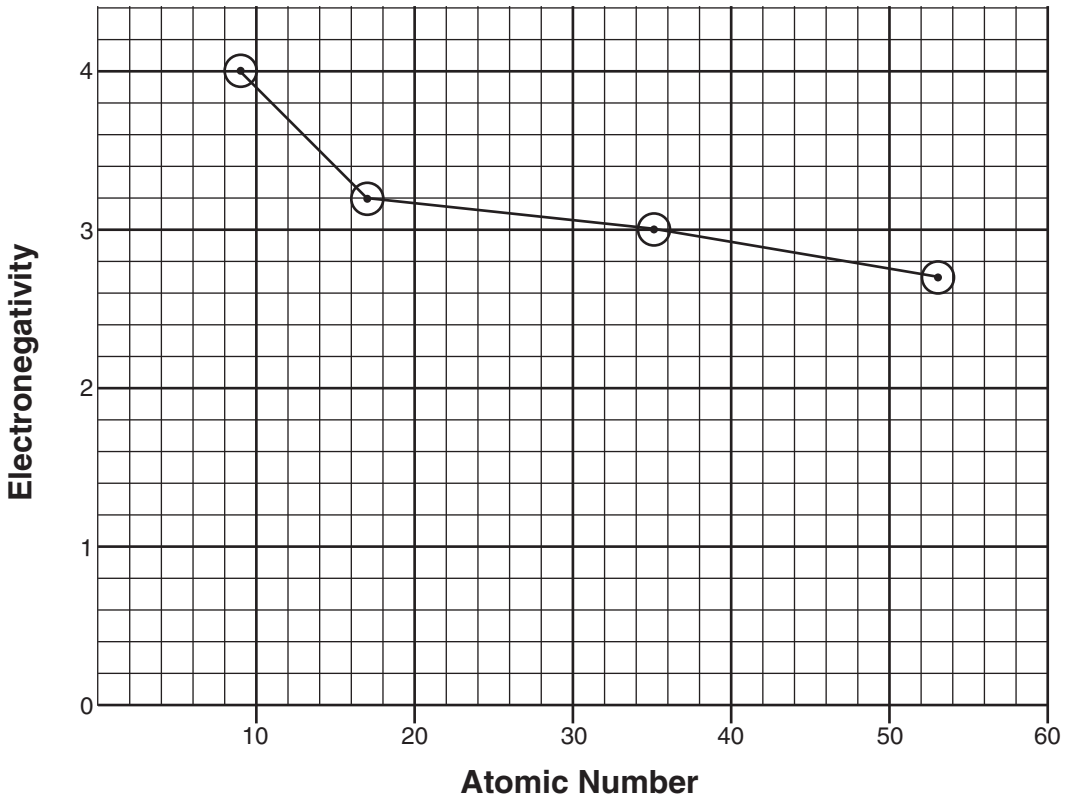
57 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

Particles in sample *A* show molecules of a compound whereas particles in sample *B* show two compounds as a mixture.

A – compound, *B* – mixture

A – 1 compound, *B* – 2 compounds

58 and **59** An example of a correct response is shown below.



58 [1] Allow 1 credit for marking an appropriate scale. An appropriate scale is one that allows a trend to be seen.

59 [1] Allow 1 credit for plotting all the points correctly (±0.3 grid space). Plotted points do *not* need to be circled or connected.

60 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

The difference in electronegativity for the H–F bond is 1.9 and the electronegativity difference for the H–I bond is 0.6. The difference for H–F is greater and therefore H–F is more polar.

H–F is more polar because F is more electronegative than I.

61 [1] Allow 1 credit for **96**.

62 [1] Allow 1 credit for a correct numerical setup. Units do *not* need to be shown. Acceptable responses include, but are not limited to, these examples:

$$11\text{ g} \times \frac{1\text{ mole}}{44\text{ g}}$$

$$\frac{11}{44}$$

63 [1] Allow 1 credit for a correct response. Do *not* allow credit for answers only citing Reference Table *G*. Acceptable responses include, but are not limited to, these examples:

Increasing the temperature favors the forward, endothermic reaction.

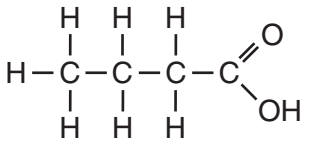
Adding heat shifts the reaction to the right.

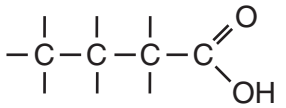
64 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

The rate of dissolving KNO_3 is equal to the rate of recrystallizing KNO_3.

The KNO_3 is going into the solution at the same rate it precipitates out of the solution.

65 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:





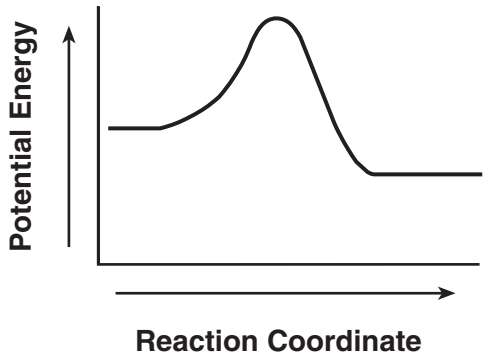
[6]

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 for __ Fe_2O_3 + **3** CO → **2** Fe + **3** CO_2. Allow credit even if the coefficient "1" is written in front of Fe_2O_3.

67 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, this example:



68 [1] Allow 1 credit for **+4** or **4**.

69 [1] Allow 1 credit for **1535**.

70 [1] Allow 1 credit for **18**.

71 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

potassium atom 2-8-8-1 and potassium ion 2-8-8

The K^+ ion has only three electron shells.

72 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

charge

mobility

size

73 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

polymerization

addition polymerization

synthesis

addition

74 [1] Allow 1 credit for *two* correct responses. The responses must be two *different* consumer products. Acceptable responses include, but are not limited to, these examples:

synthetic fibers

clothing

carpeting

antifreeze (ethylene glycol)

food wrap

plastic bottles

high-density polyethylene

low-density polyethylene

75 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

has a carbon-carbon double bond

Two carbons share four electrons.

C = C

76 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

2

Zn

anode

right

77 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, this example:

$Pb^{2+} + 2e^- \rightarrow Pb$

or

Allow 1 credit for a response consistent with the student's answer to question 76.

78 [1] Allow 1 credit for a correct response indicating direction. Acceptable responses include, but are not limited to, these examples:

from anode to cathode

Zn electrode to Pb electrode

to the left

from half-cell 2 to half-cell 1

– to +

or

Allow 1 credit for a response consistent with the student's answer to question 76.

79 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

insoluble

not soluble

80 [1] Allow 1 credit for a correct numerical setup. Correct numerical substitutions must be shown for all three brands. Units do *not* need to be shown. Acceptable responses include, but are not limited to, these examples:

X: $\frac{25.20\ \text{mL}}{2.00\,\text{g}}$

Y: $\frac{18.65\ \text{mL}}{1.20\,\text{g}}$

Z: $\frac{22.50\ \text{mL}}{1.75\,\text{g}}$

81 [1] Allow 1 credit for **Y**.

or

Allow 1 credit for a response consistent with the student's setup for brands *X*, *Y*, and *Z* in question 80.

82 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

cause bone tumors

damage bone marrow

can cause leukemia or anemia

radioactive

DNA damage

death

83 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

$^{226}_{88}\text{Ra} \rightarrow {}^{4}_{2}\text{He} + {}^{222}_{86}\text{Rn}$

$^{226}_{88}\text{Ra} \rightarrow {}^{222}_{86}\text{Rn} + {}^{4}_{2}\alpha$

84 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

Radium and calcium are both located in Group 2 on the Periodic Table.

same family

2 valence electrons

85 [1] Allow 1 credit for **1600**.

The *Chart for Determining the Final Examination Score for the August 2004 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Tuesday, August 17, 2004. 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

August 2004 Physical Setting/Chemistry			
Question Numbers			
Key Ideas	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		42,50,58,59,60	69,80
Math Key Idea 2			
Math Key Idea 3			80,81
Sci. Inq. Key Idea 1		54	71,75,84
Sci. Inq. Key Idea 2			
Sci. Inq. Key Idea 3			68,85
Eng. Des. Key Idea 1			
Standard 2			
Key Idea 1			79
Key Idea 2			
Standard 6			
Key Idea 1			
Key Idea 2			
Key Idea 3			
Key Idea 4			
Key Idea 5			
Standard 7			
Key Idea 1			74,80,81,82
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		34,35,36,37,39, 40,44,45,46,47, 48,51,52,53,55, 56,57,61,62,63, 64,65	66,70,73,76, 77,78,83
Key Idea 4		43,49	67,85
Key Idea 5		38,41	72
Standard 4			
Key Idea 3	1,2,3,4,7,8,9,11, 12,13,15,17,18, 20,21,22,23,24, 25,26,27,28,29, 30,32,33	34,35,36,37,39, 40,44,45,46,47, 48,50,51,52,53, 55,56,57,58,59, 61,62,63,64,65	66,68,72,73, 74,75,76,77, 78,79,80,81, 84
Key Idea 4	14,19,31	42,43,49,54	67,69,82,83,85
Key Idea 5	5,6,9,10,16	38,40,41,60	70,71,72
Reference Tables			
2002 Edition	2,4,7,10,14, 27,31,32	34,35,36,38,39, 40,41,42,44,47, 48,49,50,51,53, 58,59,60,61,62	68,69,70,75, 79,83,84,85