FOR TEACHERS ONLY

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

PS–CH PHYSICAL SETTING/CHEMISTRY

Wednesday, August 16, 2006 — 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

1	2	11	3	21	3
2	4	12	1	22	4
3	1	13	2	23	1
4	2	14	1	24	2
5	3	15	3	25	4
6	3	16	2	26	1
7	4	17	3	27	3
8	3	18	2	28	4
9	3	19	4	29	4
10	2	20	4	30	2

Part B–1

31	3	41	1
32	2	42	3
33	4	43	3
34	3	44	1
35	1	45	1
36	2	46	4
37	1	47	3
38	2	48	1
39	4	49	2
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 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 Wednesday, August 16, 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 15 credits for this part. The student must answer all questions in this part.

51 [1] Allow 1 credit.

Examples of a 1-credit response:

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

An atom of each element has six electrons in its outer shell.

same number of valence electrons

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

heterogeneous

nonuniform

54 [1] Allow 1 credit for compound or compounds.

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

The water molecules, sodium ions, and chloride ions are uniformly mixed together.

All particles distribute evenly.

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

Evaporate the water.

Decant the water.

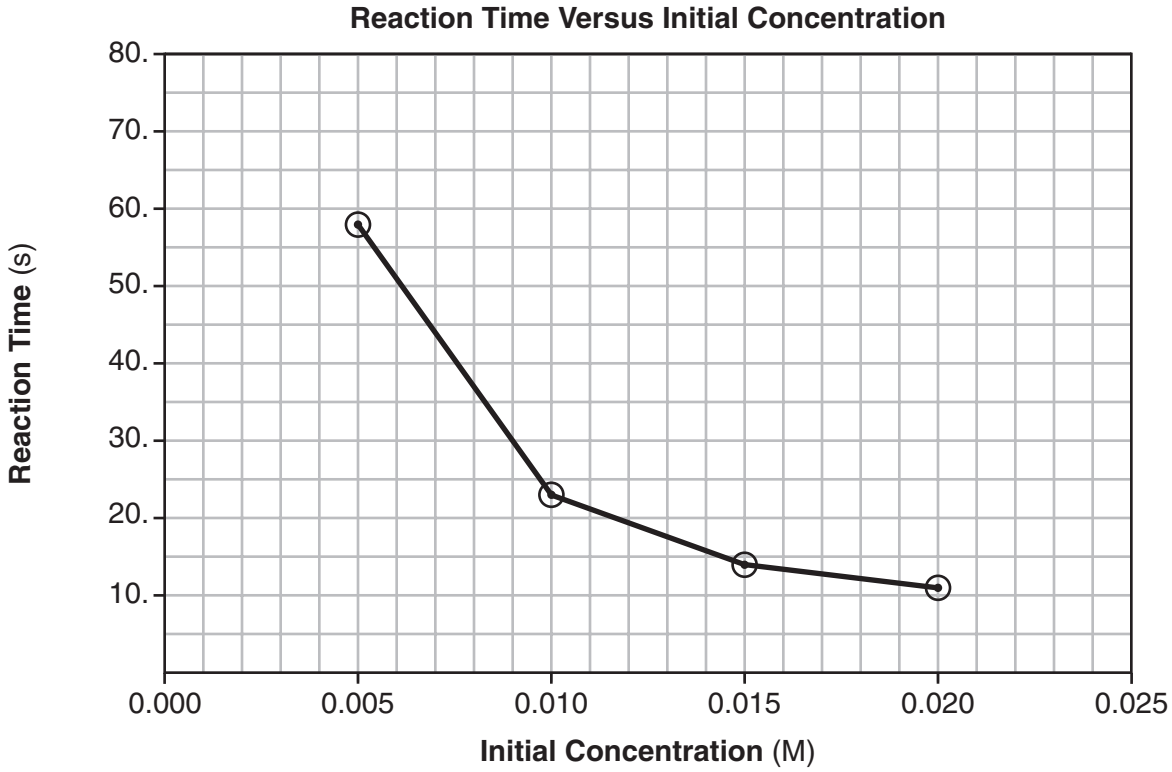
filtration

57 [1] Allow 1 credit for marking an appropriate scale. An appropriate scale is linear and allows a trend to be seen.

58 [1] Allow 1 credit for plotting all four points correctly ± 0.3 grid space. Plotted points do *not* need to be circled or connected.

57 and **58**

Example of a 2-credit graph for questions 57 and 58:



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

As concentration of the reactant decreases, the rate of the reaction decreases.

As concentration increases, the rate of reaction increases.

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

The greater the kinetic energy of the reactant particles, the greater the frequency and effectiveness of the collisions.

Increasing the temperature causes more collisions.

more effective collisions

61 [1] Allow 1 credit for propene.

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

addition

halogenation

bromination

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

202 g/mol

201.9 g/mol

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

$^{4}_{2}He$

alpha particle

α

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

The nucleus of Pb-206 is stable.

Pb-206 is not radioactive.

If Pb-206 were not stable, it would spontaneously decay.

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:

$^{59}_{26}\text{Fe} \rightarrow {}^{0}_{-1}\text{e} + {}^{59}_{27}\text{Co}$

$^{59}_{26}\text{Fe} \rightarrow {}^{59}_{27}\text{Co} + {}^{0}_{-1}\beta$

67 [1] Allow 1 credit. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

$\frac{1}{16}$

0.0625

$6\frac{1}{4}\%$

68 [1] Allow 1 credit for solid.

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

Metals have freely moving valence electrons.

mobile valence electrons

sea of mobile electrons

Electrons are delocalized.

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

The ionic radius is smaller because the atom loses two electrons.

The ion has one less occupied energy level.

71 [1] Allow 1 credit for MI_2.

72 [1] Allow 1 credit for 50.°C ± 2°C.

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

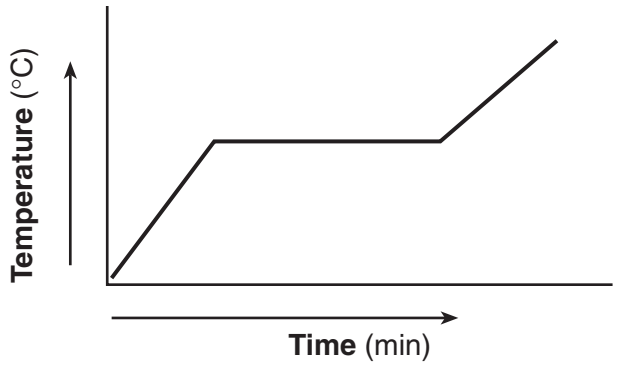
The average kinetic energy of the particles remains the same.

KE remains constant.

no change

74 [1] Allow 1 credit.

Example of a 1-credit response:



75 [1] Allow 1 credit for 288 K.

76 [1] Allow 1 credit. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:

9.50 mL HCl(aq) and 3.80 mL NaOH(aq)

9.5 mL HCl(aq) and 3.8 mL NaOH(aq)

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

$(0.10\ M)(9.50\ mL) = M_B(3.80\ mL)$

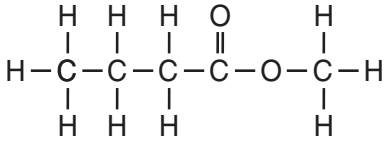
$\frac{(0.1)(9.5)}{3.8}$

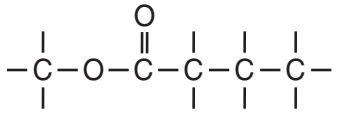
or

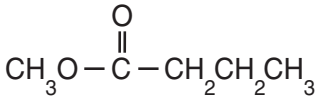
Allow credit for a response consistent with the student's answer to question 76.

78 [1] Allow 1 credit.

Examples of a 1-credit response:







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

ethanol

ethyl alcohol

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

Drain cleaner contains KOH or NaOH, which are bases with a pH value greater than 7.

A pH of 12.8 indicates a base.

A base has a pH above 7.

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

The liquids in bottle 1 and bottle 2 both have a pH below 8, but thymol blue does not change color until the pH value reaches at least 8.0.

The pH range for the thymol blue color change is too high.

82 [1] Allow 1 credit for _____ Mg(s) + __2__ HCl(aq) → _____ $MgCl_2$(aq) + _____ H_2(g). Allow credit even if the coefficient "1" is written in front of Mg(s), $MgCl_2$(aq), or H_2(g).

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

The reaction is single replacement.

single displacement

redox

84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

$2.50\ \text{g} \times \frac{1\ \text{mol}}{24.3\ \text{g}}$

$\frac{2.50}{24}$

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

Ag is below H_2 in the activity series.

Ag is more difficult to oxidize.

Regents Examination in Physical Setting/Chemistry

August 2006

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

The *Chart for Determining the Final Examination Score for the August 2006 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Wednesday, August 16, 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.

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

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