FOR TEACHERS ONLY

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

PS–CH PHYSICAL SETTING/CHEMISTRY

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

H_2O + KCl

KCl(aq)+ HOH(ℓ)

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

(1.22 M)(10.00 mL) = M_B(15.65 mL)

$\frac{(1.22)(10)}{15.65}$

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

solidification

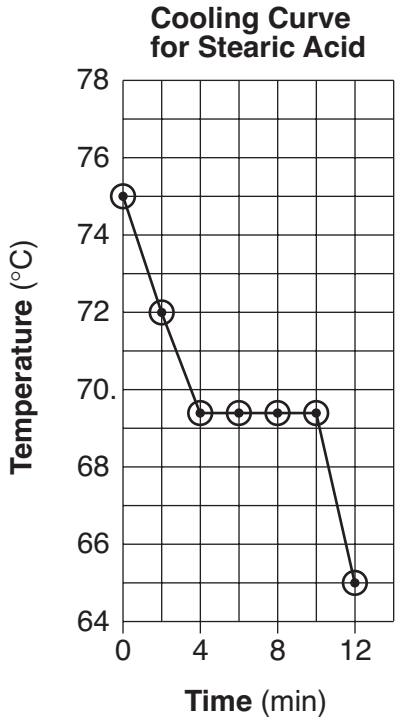
freezing

crystallization

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

- Allow 1 credit for marking an appropriate scale on the axis labeled "Temperature (°C)." An appropriate scale is linear and allows a trend to be seen.
- Allow 1 credit for plotting all seven points correctly ± 0.3 grid space. Plotted points do *not* need to be circled or connected.

Example of a 2-credit response:



55 [1] Allow 1 credit for 284 g/mol. Significant figures do *not* need to be shown.

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

$$20.0\,\text{g} \times \frac{1\,\text{mol}}{85.0\,\text{g}}$$

$$\frac{20}{85}$$

57 [1] Allow 1 credit for 68 g ± 1 g.

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

evaporation of the water

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

halide

halocarbon

alkyl halide

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

A 2-methylpropane molecule has only single carbon-carbon bonds.

There are only single bonds in methylpropane.

no multiple bonds between carbon atoms

61 [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for correctly describing the molecular polarities. Acceptable responses include, but are not limited to:

  The molecules of 2-iodo-2-methylpropane are more polar than the molecules of 2-methylpropane.

- Allow 1 credit for correctly describing the intermolecular forces. Acceptable responses include, but are not limited to:

  There are stronger intermolecular forces between molecules of 2-iodo-2-methylpropane.

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

The initial concentration of each gas is constant.

Concentrations stay the same.

Note: Do *not* allow credit for a response stating the rate of the forward reaction equals the rate of the reverse reaction *or* for stating the concentrations are equal.

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

The stress of adding $H_2(g)$ shifts the reaction to the right, producing $NH_3(g)$.

The reaction shifts to the right to relieve the stress.

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

Adding $H_2(g)$ causes more collisions between $H_2(g)$ molecules and $N_2(g)$ molecules. Therefore, more $H_2(g)$ reacts, reducing the $H_2(g)$ concentration.

More collisions between H_2 and N_2 produce NH_3, so more H_2 is used up.

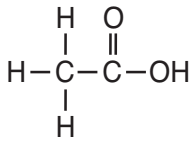
Part C

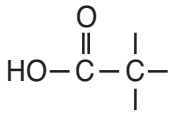
Allow a total of 19 credits for this part. The student must answer all questions in this part.

65 [1] Allow 1 credit for $NaHCO_3$.

66 [1] Allow 1 credit.

Examples of 1-credit responses:





67 [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:

  $m = Vd = (0.20\ \text{L})(1.8\ \text{g/L})$

  $(0.2)(1.8)$

- Allow 1 credit for 0.36 g *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.

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

7.6 and 8.2

8.1 and 7.7

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

1×10^{-7} mol/L

0.000 000 1 mol/L

10^{-7} mol/L

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

When the temperature of the water increases, oxygen is less soluble.

Oxygen is less soluble in warmer water.

71 [3] Allow a maximum of 3 credits, allocated as follows:

- Allow 1 credit for a correct numerical setup.
- Allow 1 credit for 7.1 ppm *or* for a response consistent with the student's numerical setup. Significant figures do *not* need to be shown.
- Allow 1 credit for a statement indicating the DO concentration in the water is healthy for fish to survive, based on the calculated result.

or

Allow 1 credit for a response consistent with the student's calculated result.

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

Example of a 3-credit response:

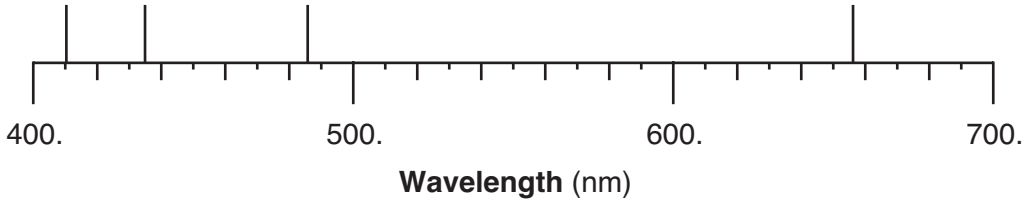
$$\text{ppm} = \frac{2.7 \times 10^{-2}}{3800\,\text{g}} \times 10^{6}$$

7.1 ppm

The water is healthy for fish because the DO is 7.1 ppm, which is within the range of DO concentrations best for fish.

72 [1] Allow 1 credit for all four lines drawn correctly ± 0.3 division. The lines can be drawn above, through, or below the scale.

Example of a 1-credit response:



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

When the electron in an excited hydrogen atom returns from a higher energy state to a lower energy state, a specific amount of energy is emitted.

Light is emitted when the excited electron drops from a higher electron shell to a lower electron shell.

74 [1] Allow 1 credit for ____ $Cd(s)$ + ____ $NiO_2(s)$ + __2__ $H_2O(\ell)$ → ____ $Cd(OH)_2(s)$ + ____ $Ni(OH)_2(s)$.

Note: Allow credit even if the coefficient "1" is written in front of $Cd(s)$, $NiO_2(s)$, $Cd(OH)_2(s)$, and/or $Ni(OH)_2(s)$.

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

from 0 to +2

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

Cadmium oxidizes in the presence of Ni^{4+}.

Cd is more reactive than Ni.

77 [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for the decay mode $^{4}_{2}\alpha$ *or* $^{4}_{2}\text{He}$.
- Allow 1 credit for the nuclide $^{237}_{93}\text{Np}$ *or* for a nuclide consistent with the student's response for the decay mode.

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

Am-241 has a longer half-life so the sample emits alpha particles for a longer period of time.

Fr-220 has a much shorter half-life and decays more rapidly.

The half-life of Am-241 is 433 years. The half-life of Fr-220 is only 27.5 s.

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

Smoke particles interrupt the flow of ions required to maintain an electric current.

fewer freely moving charged particles in the detector

Regents Examination in Physical Setting/Chemistry

June 2008

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

The *Chart for Determining the Final Examination Score for the June 2008 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Tuesday, June 17, 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

June 2008 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		35,38,52,54,56	67,71,72
Math Key Idea 2		57	70
Math Key Idea 3		34,35,36,43,44, 50,55,	65,67,71
Science Inquiry Key Idea 1		40,60,61	73,79
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3		32,34,37,44,46, 47,48,49,53,58, 59,62,63,64	65,71,72,75,76, 78
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			71,79
Standard 6			
Key Idea 1		38	
Key Idea 2		31,39,40	
Key Idea 3			69
Key Idea 4		63,64	
Key Idea 5			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		33,35,36,38,39, 41,42,43,45,46, 47,48,51,52,55, 56,57,59,60,62, 63,64	66,68,74,76
Key Idea 4		50,58	77
Key Idea 5		61	
Standard 4			
Key Idea 3	1,2,3,4,5,7,8,10, 12,13,15,19,20, 21,22,24,25,26, 27,29	31,32,33,35,36, 39,41,42,43,44, 45,46,47,48,49, 51,52,55,56,57, 59,60,62,63,64	65,66,67,68,69, 70,71,72,73,74, 75,76
Key Idea 4	16,17,18,30	38,50,53,54,58	77,78
Key Idea 5	6,9,11,14,23,28	34,37,40,61	79
Reference Tables			
2002 Edition	1,2,3,6,9,14,17, 24,25,27,28,29	32,36,37,38,41, 43,45,47,48,50, 51,52,55,56,57, 59	65,66,67,68,75, 76,77,78