FOR TEACHERS ONLY

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

P.S.–CH PHYSICAL SETTING/CHEMISTRY

Thursday, August 13, 2015 — 12:30 to 3:30 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 2 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 at: http://www.p12.nysed.gov/assessment/ and select the link "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**	9 . . . . . **1**	17 . . . . . **3**	25 . . . . . **3** . . . . .
2 . . . . . **3**	10 . . . . . **1**	18 . . . . . **3**	26 . . . . . **4** . . . . .
3 . . . . . **3**	11 . . . . . **2**	19 . . . . . **4**	27 . . . . . **1** . . . . .
4 . . . . . **4**	12 . . . . . **2**	20 . . . . . **2**	28 . . . . . **2** . . . . .
5 . . . . . **4**	13 . . . . . **4**	21 . . . . . **2**	29 . . . . . **2** . . . . .
6 . . . . . **3**	14 . . . . . **4**	22 . . . . . **1**	30 . . . . . **4** . . . . .
7 . . . . . **1**	15 . . . . . **3**	23 . . . . . **3**	
8 . . . . . **4**	16 . . . . . **2**	24 . . . . . **4**	

Part B–1

31 . . . . . **2**	36 . . . . . **1**	41 . . . . . **4**	46 . . . . . **1** . . . . .
32 . . . . . **1**	37 . . . . . **1**	42 . . . . . **3**	47 . . . . . **2** . . . . .
33 . . . . . **4**	38 . . . . . **3**	43 . . . . . **1**	48 . . . . . **4** . . . . .
34 . . . . . **3**	39 . . . . . **3**	44 . . . . . **1**	49 . . . . . **4** . . . . .
35 . . . . . **1**	40 . . . . . **3**	45 . . . . . **3**	50 . . . . . **4** . . . . .

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Physical Setting/Chemistry. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences.*

Do not attempt to correct the student's work by making insertions or changes of any kind. If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the Part B–2 and Part C open-ended questions on a student's paper. 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 more than approximately one-half of the open-ended questions on a student's answer paper. Teachers may not score their own students' answer papers.

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. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not be given when the wording of the questions allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the box labeled "Total Raw Score." Then the student's raw score should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Thursday, August 13, 2015. The student's scale score should be entered in the box labeled "Scale Score" on the student's answer sheet. The scale score is the student's final examination score.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart may change from one administration 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 for any value from 148 kPa to 152 kPa, inclusive.

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

Solid NaCl has less entropy because the particles have a more ordered arrangement than aqueous NaCl.

NaCl(aq) is a mixture that contains water molecules and ions moving more randomly.

Particle arrangement in NaCl(s) is less random.

53 [1] Allow 1 credit for $C_4H_8O_4$. The order of the elements can vary.

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

Ion charges are not shown.

No electron transfer is shown in the diagram.

The student's diagram represents a molecular compound.

55 [1] Allow 1 credit for 114 g/mol. Significant figures do *not* need to be shown.

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

The mass of a proton is greater than the mass of an electron.

An electron has less mass.

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

number of atoms of C-13 = $(0.0107)(3.28 \times 10^{24}$ atoms of carbon)

$(1.07\%)(3.28 \times 10^{24})$

$(1.07 \times 10^{-2})(3.28 \times 10^{24})$

58 [1] Allow 1 credit for any value from 94°C to 96°C, inclusive.

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

The potential energy of the particles increases during the interval BC.

The particles of the sample gain potential energy.

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

hydronium ion

hydronium

hydrogen ion

hydrogen

61 [1] Allow 1 credit for red.

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

The $^{235}_{92}U$ nucleus splits into two smaller nuclei.

One large atom is broken down into smaller atoms.

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

$^{140}_{55}Cs$

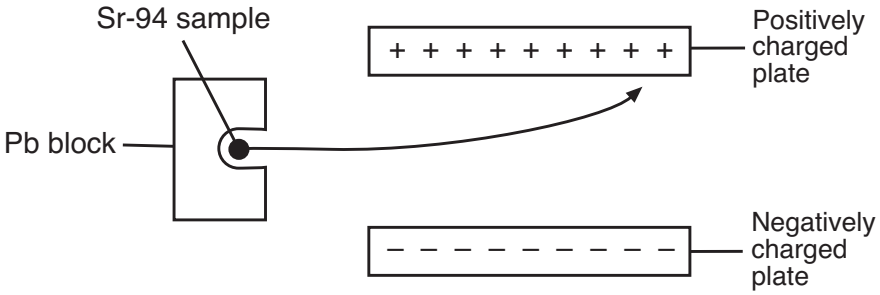
cesium-140

Cs-140

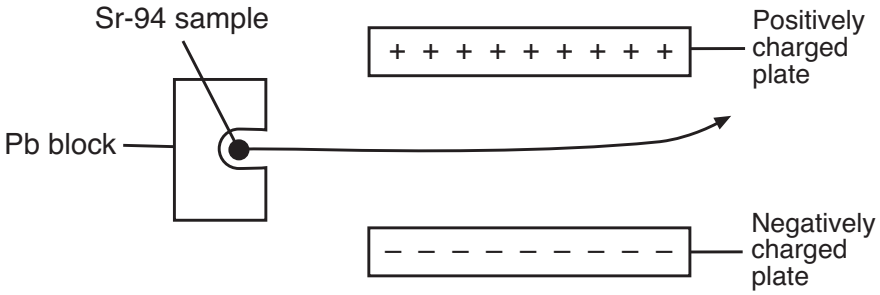
64 [1] Allow 1 credit for 5.00 min. Significant figures do *not* need to be shown.

65 [1] Allow 1 credit.

Examples of 1-credit responses:



An electric field exists between the two plates.



An electric field exists between the two plates.

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 71.6% *or* any value from 71.55% to 72%, inclusive.

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

$(0.57)(120.90\ \text{u}) + (0.43)(122.90\ \text{u})$

$\frac{(57)(120.9) + (43)(122.9)}{100}$

$(57\%)(120.9) + (43\%)(122.9)$

68 [1] Allow 1 credit for $\underline{2}\ Sb_2S_3(s) + \underline{9}\ O_2(g) \rightarrow \underline{2}\ Sb_2O_3(s) + \underline{6}\ SO_2(g)$.

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

ionic bonds and polar covalent bonds

covalent and ionic

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

The solution is saturated because some $NH_4Cl(s)$ remained undissolved at the bottom of the test tube after stirring the contents of the test tube for 4 minutes.

Not all NH_4Cl dissolved.

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

The dissolving of $NH_4Cl(s)$ is endothermic because the temperature of the solution is lower than the temperature of the water.

The water temperature was 25.8°C and the solution temperature was 11.2°C.

The temperature decreased during the dissolving.

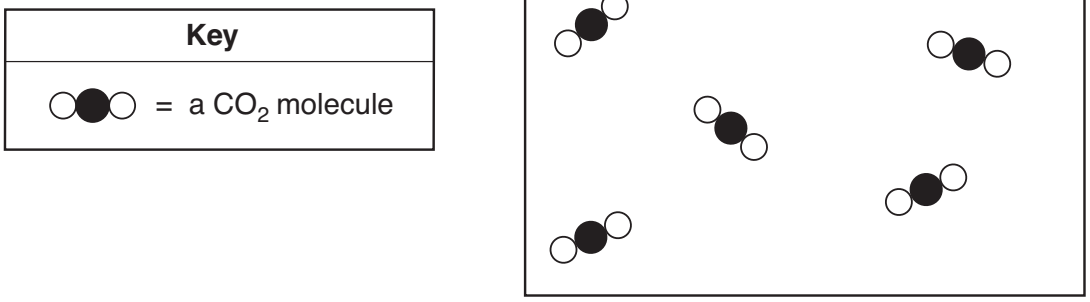
72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

No solute remained in the bottom of the test tube.

No $NH_4Cl(s)$ observed after the stirring.

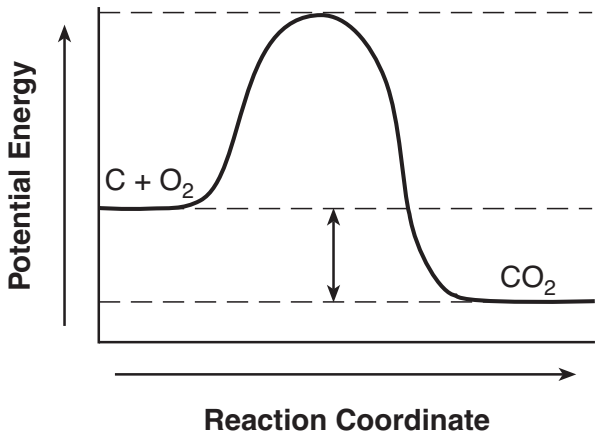
73 [1] Allow 1 credit.

Example of 1-credit response:



74 [1] Allow 1 credit.

Example of 1-credit response:



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

A NaCl solution has a lower freezing point than water.

FP of the salt water on the road $< 0°C$

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

The sample is greater than 25% NaCl by mass.

The ratio by mass of sand to NaCl in the sample is 2 to 1.

The mass of the salt is too great.

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

PbI_2

lead(II) iodide

78 [1] Allow 1 credit for 6.8 g. Significant figures do *not* need to be shown.

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

alcohol

alcohols

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

Molecules of the organic compounds are mostly nonpolar due to the large hydrocarbon part of each molecule, and water molecules are polar.

The polar effect of the –OH group is insignificant compared to the nonpolar part of each organic molecule.

Water molecules are polar. Geraniol and linalool molecules are primarily nonpolar.

81 [1] Allow 1 credit for $MgCl_2(aq)$.

82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Hydrogen ion concentration: decreases/lower

pH: increases/higher

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

Oxides are formed.

A substance reacts with oxygen.

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

from -4 to $+4$

from negative four to four

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

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

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

Regents Examination in Physical Setting/Chemistry

August 2015

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

The *Chart for Determining the Final Examination Score for the August 2015 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Thursday, August 13, 2015. 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.

Online Submission of 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 http://www.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm.
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 2015 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		48, 51, 58, 64	
Math Key Idea 2			72, 82, 85
Math Key Idea 3		48, 53, 57, 64	66, 67, 68, 70, 78, 84
Science Inquiry Key Idea 1		39, 40, 56, 59, 60, 61, 62	69, 75, 77
Science Inquiry Key Idea 2		47	
Science Inquiry Key Idea 3		45, 49, 54, 61, 62	66, 71, 73, 76, 77, 78, 80, 83, 84
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			71
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1			
Key Idea 2		47, 54, 65	83
Key Idea 3		57	82
Key Idea 4		44	
Key Idea 5			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		31, 32, 33, 34, 35, 36, 41,42, 43, 44, 46, 48, 50, 52, 53, 55, 61	67, 68, 70, 72, 73, 78, 79, 80, 81, 85
Key Idea 4		59, 63, 64	71, 74
Key Idea 5		37, 38, 54	
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 8, 9, 13, 14, 15, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 28	31, 32, 33, 34, 35, 36, 41, 42, 43, 44, 45, 46, 47, 48, 50, 52, 53, 55, 56, 57, 60, 61, 65	66, 67, 68, 70, 72, 73, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85
Key Idea 4	16, 29	49, 59, 62, 63, 64	71, 74
Key Idea 5	7, 10, 11, 12, 21, 30	37, 38, 39 40, 51, 54, 58	69, 80
Reference Tables			
2011 Edition	1, 2, 5, 10, 12, 15, 23, 29	32, 33, 34, 35, 36, 38, 39, 43, 45, 48, 50, 53, 54, 55, 60, 64	66, 69, 72, 77, 79, 81, 84, 85