FOR TEACHERS ONLY

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

PS–CH PHYSICAL SETTING/CHEMISTRY

Wednesday, January 28, 2004 — 9:15 a.m. to 12:15 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 3 before rating student papers.

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

Part A

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

Part B–1

32 . . . 4	42 . . . 4
33 . . . 2	43 . . . 3
34 . . . 1	44 . . . 2
35 . . . 1	45 . . . 2
36 . . . 2	46 . . . 1
37 . . . 3	47 . . . 1
38 . . . 1	48 . . . 3
39 . . . 4	49 . . . 2
40 . . . 1	50 . . . 2
41 . . . 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 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 printed at the end of this Scoring Key and Rating Guide. 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 13 credits for this part. The student must answer all questions in this part.

51 [1] Allow 1 credit for ____ $C_5H_{12}(g)$ + **8** $O_2(g) \rightarrow$ **5** $CO_2(g)$ + **6** $H_2O(g)$. Allow credit even if the coefficient "1" is written in front of $C_5H_{12}(g)$.

52 [2] ***a*** Allow 1 credit for a correct numerical setup. Acceptable responses include, but are not limited to, these examples:

$$\frac{8\ O_2}{6\ H_2O} = \frac{5.0\ O_2}{X\ H_2O}$$

$$\frac{5\ \text{moles}\ O_2}{8} = \frac{X\ \text{moles}\ H_2O}{6}$$

$$5\ \text{mol}\ O_2 \times \frac{6\ \text{mol}\ H_2O}{8\ \text{mol}\ O_2}$$

or

Allow 1 credit for a numerical setup consistent with the student's response to question 51.

b Allow 1 credit for **3.75** or **3.8**.

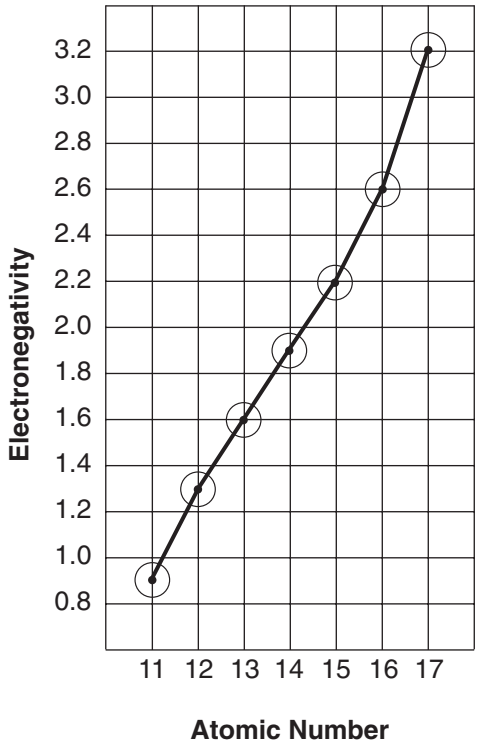
or

Allow 1 credit for a response consistent with the student's numerical setup for question 52*a*.

53 [1] Allow 1 credit for *at least six* correctly listed electronegativities as shown below.

Atomic Number	Electronegativity
11	**0.9** or **.9**
12	**1.3**
13	**1.6**
14	**1.9**
15	**2.2**
16	**2.6**
17	**3.2**

54 and **55** An example of an acceptable response is shown below.



54 [1] Allow 1 credit for a correctly scaled *y*-axis.

55 [1] Allow 1 credit for correctly plotting (±0.3 grid space) and connecting the points. Allow credit even if the points are not circled.

56 [1] Allow 1 credit for **KCl** or **potassium chloride.**

57 [1] Allow 1 credit for **90** (±2).

58 [1] Allow 1 credit for **30** (±2).

or

Allow 1 credit for a response consistent with the student's answer to question 57.

59 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

half-cell 1

Pb

left

lead

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

from the Pb electrode to the Ag electrode

left to right

cell 1 → cell 2

Note: Allow credit for "right to left" or for its equivalent *only* if it is consistent with the student's response to question 59.

Do *not* allow credit for a response that indicates that electrons flow through the salt bridge.

61 [1] Allow 1 credit for $\mathbf{Pb(s) \rightarrow Pb^{2+}(aq) + 2e^-}$. Allow credit even if the labels (s) and (aq) are not included.

62 [1] Allow 1 credit for  or for any other acceptable arrangement of five dots around the element symbol P.

Part C

Allow a total of 22 credits for this part. The student must answer all questions in this part.

63 [2] Allow 1 credit for ***A***.

and

Allow 1 credit for ***D***.

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

Energy is released when an electron falls from a high state (excited) to a low state (ground).

excited state to ground state

high energy to low energy

65 [1] Allow 1 credit for **3**.

66 [1] Allow 1 credit for **2**.

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

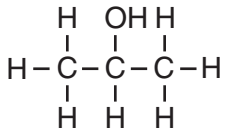
A compound must contain two or more different elements.

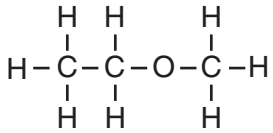
only 1 kind of atom present

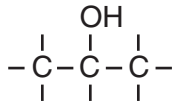
68 [1] Allow 1 credit for **esterification** or **making an ester**.

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

70 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:







Note: Do *not* allow credit if the student has placed the —OH group on an end carbon.

71 [2] Allow 1 credit for indicating $^{4}_{2}\text{He}$ or $^{4}_{2}\alpha$ or α on the right side of the arrow.

and

Allow 1 credit for having mass/charge balanced.

Acceptable responses include, but are not limited to, this example:

$^{241}_{95}\text{Am} \rightarrow {}^{4}_{2}\text{He} + {}^{237}_{93}\text{Np}$

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

^{85}Kr undergoes beta decay and ^{241}Am undergoes alpha decay.

Decay mode and half-life are different.

half-lives different

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

Radioactivity can be used in medical diagnosis and/or treatment.

food irradiation

radioactive dating

74 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to, these examples:

Extensive exposure can make people sick.

contamination of environment

introduction of radioactive materials into the ecosystem

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

172

172.2

76 [2] ***a*** Allow 1 credit for a correct numerical setup. Acceptable responses include, but are not limited to, these examples:

$$\frac{36\text{ g}}{172\text{ g}} \times 100$$

$$\frac{36}{172} = \frac{x}{100}$$

or

Allow 1 credit for a numerical setup consistent with the student's response to question 75.

b Allow 1 credit for a correct response. Significant figures do *not* need to be used. Acceptable responses include, but are not limited to, these examples:

21

20.9

20.93

or

Allow 1 credit for a response consistent with the student's setup. Significant figures do *not* need to be used.

77 [1] Allow 1 credit for ***D***.

78 [1] Allow 1 credit for ***C***.

79 [1] Allow 1 credit for **KNO_3** or **NaCl** or **NH_4Cl** or **NH_4NO_3**, or **potassium nitrate** or **sodium chloride** or **ammonium chloride** or **ammonium nitrate**.

80 [1] Allow 1 credit for **7**.

81 [1] Allow 1 credit for **$Ba(OH)_2$** or **$Sr(OH)_2$** or **barium hydroxide** or **strontium hydroxide**. Allow credit for just barium or strontium.

Regents Examination in Physical Setting/Chemistry
January 2004
Chart for Converting Total Test Raw Scores to Final Examination Scores (Scaled Scores)

Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score
85	100	63	72	41	58	19	39
84	98	62	71	40	58	18	37
83	96	61	70	39	57	17	36
82	95	60	70	38	57	16	34
81	93	59	69	37	56	15	33
80	91	58	68	36	55	14	31
79	90	57	68	35	55	13	29
78	88	56	67	34	54	12	27
77	87	55	67	33	53	11	26
76	85	54	66	32	52	10	24
75	84	53	66	31	51	9	22
74	83	52	65	30	51	8	20
73	82	51	64	29	50	7	17
72	80	50	63	28	49	6	15
71	79	49	63	27	48	5	13
70	78	48	62	26	47	4	10
69	77	47	62	25	46	3	8
68	76	46	61	24	45	2	5
67	75	45	61	23	44	1	3
66	74	44	60	22	42	0	0
65	74	43	60	21	41		
64	73	42	59	20	40		

To determine the student's final examination score, find the student's total test raw score in the column labeled "Raw Score" and then locate the scaled score that corresponds to that raw score. The scaled score is the student's final examination score. Enter this score in the space labeled "Final Score" on the student's answer sheet.

Map to Core Curriculum

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