

FOR TEACHERS ONLY

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

PS-CH

PHYSICAL SETTING/CHEMISTRY

Thursday, January 27, 2011 — 1:15 to 4:15 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 <http://www.p12.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 4	11 2	21 4	31 2	41 2
2 3	12 3	22 2	32 3	42 1
3 2	13 1	23 4	33 4	43 3
4 3	14 3	24 3	34 4	44 3
5 3	15 2	25 1	35 3	45 1
6 4	16 4	26 4	36 3	46 3
7 2	17 4	27 4	37 2	47 3
8 1	18 1	28 4	38 4	48 1
9 2	19 3	29 2	39 1	49 3
10 1	20 4	30 4	40 3	50 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 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.

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 scale score by using the conversion chart that will be posted on the Department's web site <http://www.p12.nysed.gov/osa/> on Thursday, January 27, 2011. The student's scale score should be entered in the labeled box on the student's answer booklet. The scale score is the student's final examination score. On the front of the student's answer booklet, raters must enter their initials on the lines next to "Rater 1" or "Rater 2."

All student answer papers that receive a scale 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 scale 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:

The electronegativity difference between H and F is greater than the electronegativity difference between H and I.

The difference for HF is 1.9, and the difference for HI is 0.6.

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

Zinc is more active than hydrogen, but copper is less active than hydrogen.

On Table J, Zn is above H₂, and Cu is below H₂.

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

$$(62.93 \text{ u})(0.6917) + (64.93 \text{ u})(0.3083)$$

$$\frac{(62.93)(69.17) + (64.93)(30.83)}{100}$$

54 [1] Allow 1 credit for 0.64 g.

55 [1] Allow 1 credit for Cu₂S.

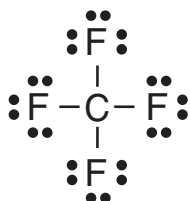
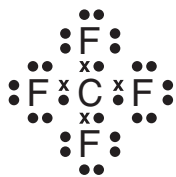
56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

At standard pressure, NH₃ has a higher boiling point than CF₄.

The melting point of CF₄ is lower.

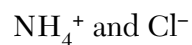
57 [1] Allow 1 credit.

Examples of 1-credit responses:



58 [1] Allow 1 credit for 1.5 M.

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



ammonium and chloride

60 [1] Allow 1 credit for *B*.

61 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

A lower concentration of oxygen gas decreases the number of effective collisions between O₂ molecules and CH₄ molecules.

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

Electrons flow from the copper electrode to the silver electrode through the wires and voltmeter.

The e⁻ flow is from Cu to Ag in the external circuit.

from anode to cathode

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

The salt bridge allows for the migration of ions between the half-cells.

The salt bridge prevents polarization of the half-cells.

maintains electrical neutrality

64 [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:

$$(M_A)(20.0 \text{ mL}) = (32.0 \text{ mL})(0.50 \text{ M})$$

$$\frac{32(0.5)}{20}$$

- Allow 1 credit for 0.80 M *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.

65 [1] Allow 1 credit for 2 *or* two.

Part C

Allow a total of 19 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:

Smaller parts of atoms exist, such as protons, neutrons, and electrons.

During some nuclear reactions, unstable atoms can spontaneously decay into smaller particles.

Atoms can lose electrons.

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

An atom of nitrogen (atomic number 7) changed into an atom of oxygen (atomic number 8).

The decay of N-16 atoms produced O-16 atoms.

Radioactive decay results in an element being changed into another element.

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

Atoms of different isotopes of an element have different masses because they have different numbers of neutrons.

Atoms of an element can differ in the number of neutrons and, therefore, masses.

69 [1] Allow 1 credit for H₂O.

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

Bubbles of CO₂ gas were produced.

The reactants and products are different chemicals.

Bonds were broken and bonds were formed.

71 [1] Allow 1 credit for 0.030 mol. Significant figures do *not* need to be shown.

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

Heat flows from the body to the cold pack.

from the area of higher temperature to the area of lower temperature

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

ionic and polar covalent

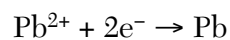
covalent and ionic

74 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

homogeneous

solution

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



76 [1] Allow 1 credit for +2.

77 [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:

$$\frac{16.0 \text{ g/mol}}{223.2 \text{ g/mol}} \times 100$$

$$\frac{16(100)}{223.2}$$

- Allow 1 credit for 7.17% *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 response that are not related to the concept assessed by the question.

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

The C_3H_6 is unsaturated because each molecule has a double covalent bond between two of its carbon atoms.

There is a carbon-carbon double bond in each molecule.

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

propene

80 [1] Allow 1 credit for alcohol *or* alcohols.

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

Wear protective gloves.

Avoid spills.

Note: Do *not* allow credit for “wearing goggles” or “wearing an apron.”

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

methyl orange

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

The hydronium ion concentration is 1000 times greater in the solution having a pH of 2.0.

The other solution has a lower H^+ ion concentration.

Regents Examination in Physical Setting/Chemistry

January 2011

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

The *Chart for Determining the Final Examination Score for the January 2011 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site <http://www.p12.nysed.gov/osa/> on Thursday, January 27, 2011. 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

January 2011 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		64, 65	77
Math Key Idea 2		51	
Math Key Idea 3		33, 49, 54	76
Science Inquiry Key Idea 1		40, 59, 61, 62	74
Science Inquiry Key Idea 2			81, 82
Science Inquiry Key Idea 3		48, 55	73, 78, 79
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1			72
Key Idea 2			66, 67, 68
Key Idea 3			83
Key Idea 4		46	
Key Idea 5			
Standard 7			
Key Idea 1			71
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		31, 32, 34, 35, 36, 37, 38, 39, 43, 47, 58, 63	69, 70, 75, 80
Key Idea 4		41, 42, 44, 50, 52, 53, 60	
Key idea 5		45, 56, 57	
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 7, 8, 10, 15, 16, 17, 19, 20, 22, 23, 24, 25, 26, 27	31, 32, 33, 34, 35, 36, 37, 38, 39, 43, 45, 46, 47, 48, 52, 53, 54, 55, 58, 59, 61, 62, 63, 64, 65	66, 68, 69, 70, 71, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83
Key Idea 4	18, 21, 28, 29, 30	41, 42, 44, 49, 50, 60	72
Key Idea 5	9, 11, 12, 13, 14	45, 51, 56, 57	67, 73
Reference Tables			
2002 Edition		32, 34, 35, 36, 37, 38, 42, 55, 56, 57, 58, 59, 62, 64	66, 68, 75, 76, 77, 79, 82, 83