

FOR TEACHERS ONLY

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

PS-CH

PHYSICAL SETTING/CHEMISTRY

Wednesday, June 22, 2005 — 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. Visit the site <http://www.emsc.nysed.gov/osa/> and select the link "Latest Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and at least one more time before the final scores for the examination are recorded.

Part A and Part B-1

Allow 1 credit for each correct response.

Part A			Part B-1	
1 3	12 1	23 2	34 4	43 3
2 4	13 2	24 3	35 3	44 1
3 1	14 1	25 4	36 1	45 4
4 4	15 2	26 3	37 2	46 1
5 3	16 1	27 3	38 3	47 2
6 4	17 2	28 1	39 2	48 4
7 1	18 3	29 3	40 3	49 2
8 4	19 2	30 2	41 1	50 2
9 1	20 2	31 4	42 1	
10 4	21 1	32 3		
11 1	22 3	33 2		

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 that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Wednesday, June 22, 2005. 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.

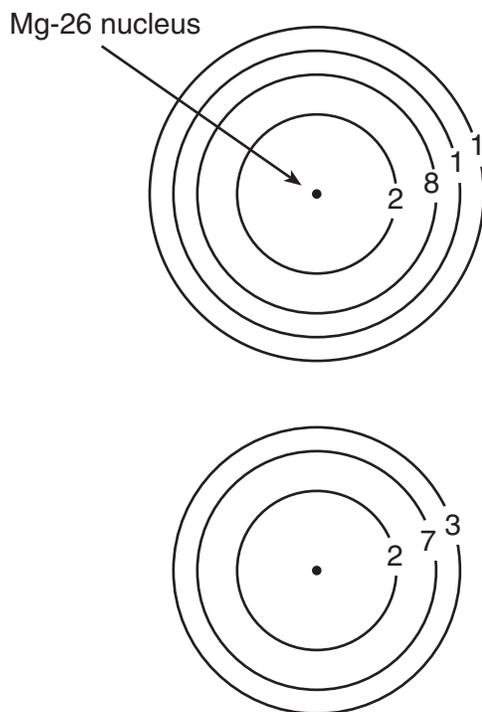
Because scaled scores corresponding to raw scores in the conversion chart may change from one examination to another, it is crucial that for each administration, the conversion chart provided for that administration be used to determine the student's final score.

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 for 2 or two.

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



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

Germanium atoms and silicon atoms both have the same number of valence electrons.

4 valence e^- in each

same number of valence electrons

54 [1] Allow 1 credit for 6.0 or 6 or six. Significant figures do *not* need to be shown.

- 55 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:



- 56 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:

The sodium atom transfers its one valence electron to the chlorine atom.



Metal loses e^- to nonmetal.

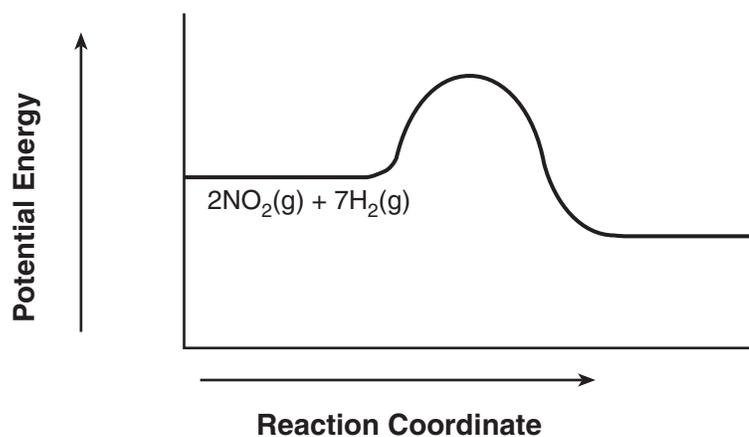
- 57 [2] Allow a maximum of 2 credits, allocated as follows:

Allow 1 credit for showing a peak that is higher than the beginning and the end of the curve.

and

Allow 1 credit for showing that the PE of products is lower than the PE of reactants.

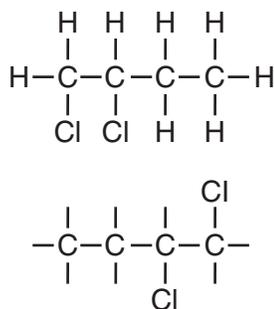
Acceptable responses include, but are not limited to:



- 58 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
- An increase in temperature favors the endothermic (reverse) reaction, consuming more $\text{NH}_3(\text{g})$.
- temperature \uparrow , reaction shifts left

- 59 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
- addition
- chlorination
- halogenation
- redox
- synthesis

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



- 61 [1] Allow 1 credit for all *three* correct responses shown below.

Element	Number of Protons	Number of Neutrons	Mass Number	Nuclide
C	6	6	12	C-12
N	7	9	16	N-16
Ne	10	9	19	Ne-19 or ^{19}Ne
S	16	16	32	S-32

- 62** [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:

The neutron-to-proton ratio causes the nuclide to be stable.

The nuclide has an equal number of neutrons and protons.

because of neutron-proton ratio

- 63** [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:

9:7

$\frac{9}{7}$

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

${}_{-1}^0\text{e} + {}_8^{16}\text{O}$

$\beta^{-} + {}_8^{16}\text{O}$

Part C

Allow a total of 20 credits for this part. The student must answer all questions in this part.

- 65** [2] Allow a maximum of 2 credits, 1 credit for *each* correct conclusion. Acceptable conclusions include, but are not limited to:

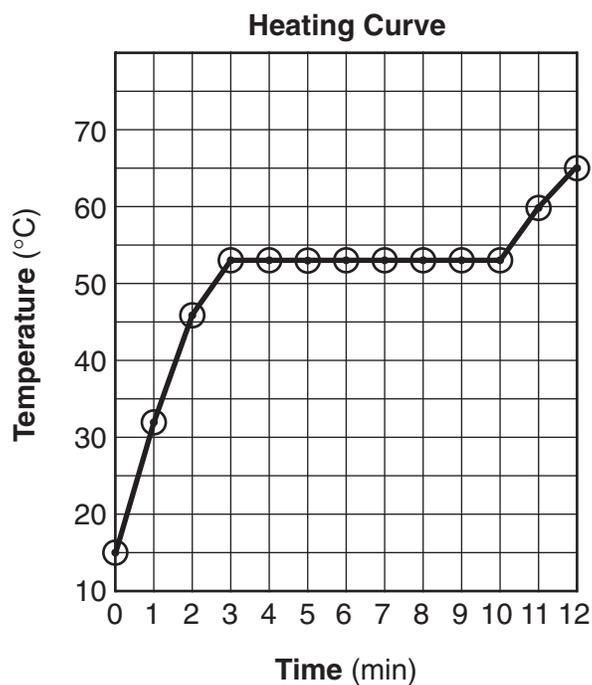
The nucleus is small.

The nucleus is positively charged.

The atom is mostly empty space.

The nucleus is dense.

- 66** and **67** An example of an acceptable response is shown below.



- 66** [1] Allow 1 credit for marking an appropriate scale. An appropriate scale is one that allows a trend to be seen.

- 67** [1] Allow 1 credit for plotting all the points correctly (± 0.3 grid space). Plotted points do *not* need to be circled or connected.

- 68** [1] Allow 1 credit for 53°C.

- 69 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
- The temperature of the substance is increasing.
 - temperature \uparrow
 - positive slope for this section of graph
- 70 [1] Allow 1 credit for 915 J. Significant figures do *not* need to be shown.
- 71 [1] Allow 1 credit for 12 mol or 12.0 mol or twelve mol. Significant figures do *not* need to be shown.
- 72 [1] Allow 1 credit for the symbol or name of *one* of the following metals from Reference Table J:
- Li Ba
 - Rb Sr
 - K Ca
 - Cs Na
- 73 [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
- The salt bridge allows ions to flow between the half-cells.
 - maintains electrical neutrality
 - prevents polarization
- 74 [1] Allow 1 credit for $\underline{2}$ HNO_3 + $\underline{\hspace{1cm}}$ $\text{Ca(OH)}_2 \rightarrow \underline{\hspace{1cm}}$ $\text{Ca(NO}_3)_2$ + $\underline{2}$ H_2O . Allow credit even if the coefficient 1 is written in front of Ca(OH)_2 and $\text{Ca(NO}_3)_2$.
- 75 [1] Allow 1 credit for 6.0 or 6 or six. Significant figures do *not* need to be shown.
- 76 [1] Allow 1 credit for a correct response. Significant figures do *not* need to be shown. Acceptable responses include, but are not limited to:
- 0.0033 M
 - 3.25×10^{-3} M
- 77 [1] Allow 1 credit for 0.500 mol. Significant figures do *not* need to be shown.

- 78** [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
 Equal volumes of two gases at the same temperature and pressure contain equal number of particles.
 both gases — same conditions

- 79** [1] Allow 1 credit for a correct numerical setup. Acceptable responses include, but are not limited to:

$$\frac{(1.0 \text{ atm})(12.3 \text{ L})}{(300 \text{ K})} = \frac{(P_2)(12.3 \text{ L})}{(450 \text{ K})}$$

$$\frac{1}{300} = \frac{x}{450}$$

$$\frac{450}{300}$$

- 80** [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
 As the number of carbon atoms in these molecules increases, the boiling point increases.
 carbon atoms ↓, boiling point ↓

- 81** [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
 The intermolecular forces are weaker for molecules that have fewer carbon atoms.
 greater number of carbon atoms, stronger intermolecular forces

- 82** [1] Allow 1 credit for a correct response. Acceptable responses include, but are not limited to:
 methane
 ethane
 propane
 methyl propane
 butane

- 83** [1] Allow 1 credit for 18 or eighteen.

The *Chart for Determining the Final Examination Score for the June 2005 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Wednesday, June 22, 2005. 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.

Map to Core Curriculum

June 2005 Physical Setting/ Chemistry			
Question Numbers			
Key Ideas	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		63	66,67,68,79
Math Key Idea 2			81
Math Key Idea 3		39,42	78
Sci. Inq. Key Idea 1		56,62	78
Sci. Inq. Key Idea 2			
Sci. Inq. Key Idea 3		36,38,43,45,53, 57,61	65,72,80,82,83
Eng. Des. Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1			
Key Idea 2		52	
Key Idea 3			75
Key Idea 4		58	
Key Idea 5			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		34,35,37,41,47, 48,49,50,51,52, 53,54,58,59,60, 64	71,73,74,76,77,79
Key Idea 4		44,57	68,69,70
Key Idea 5		40,46,55	
Standard 4			
Key Idea 3	1,2,3,4,5,6,7,9, 10,13,14,15,16, 18,19,20,21,22, 23,24,25,26,27, 28,31,33	34,35,36,37,38, 39,41,42,43,45, 47,48,49,50,51, 52,53,54,58,59, 60,61,62,63	65,71,72,73,74, 75,76,77,78,79, 80,82,83
Key Idea 4	17,29,31,32	44,57,64	66,67,68,69,70
Key Idea 5	8,11,12,23,30	34,40,46,55,56	81
Reference Tables			
2002 Edition	2,3,4,5,7,9,10, 11,12,14,21,22, 23,24,25,27,29, 30,31	34,35,36,38,39, 40,41,42,44,47, 48,50,51,53,55, 56,60,61,63,64	65,70,72,76,79, 82,83