

FOR TEACHERS ONLY

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

P.S.–CH PHYSICAL SETTING/CHEMISTRY

Wednesday, June 20, 2018 — 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 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 3	9 4	17 1	25 1
2 4	10 4	18 4	26 3
3 2	11 3	19 3	27 2
4 2	12 1	20 2	28 2
5 1	13 3	21 3	29 3
6 4	14 1	22 2	30 4
7 1	15 1	23 1	
8 2	16 1	24 1	
Part B–1			
31 3	36 3	41 2	46 2
32 4	37 4	42 3	47 4
33 1	38 3	43 4	48 1
34 2	39 4	44 1	49 3
35 4	40 3	45 2	50 2

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 Wednesday, June 20, 2018. 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. Acceptable responses include, but are not limited to:

The first ionization energies of the elements in Period 3 generally increase from left to right.

Ionization energy increases.

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

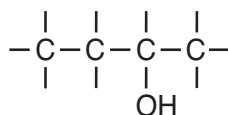
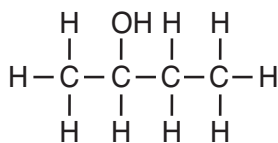
hydrogen bonding

dipole attractions

dipole-dipole forces

53 [1] Allow 1 credit.

Examples of 1-credit responses



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

The reaction between a metal and a nonmetal can produce an ionic compound.

Silver is a metal and chlorine is a nonmetal.

55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

$$\frac{2(108 \text{ g/mol})}{276 \text{ g/mol}} \times 100$$

$$\frac{(216)(100)}{276}$$

$$\frac{2(107.868)}{275.7452} \times 100$$

56 [1] Allow 1 credit for AgClO_3 or silver chlorate.

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



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



beta

beta decay

beta particle



59 [1] Allow 1 credit for 19.20 g. Significant figures do *not* need to be shown.

60 [1] Allow 1 credit for 5 min *or* five min.

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

The intermolecular forces are weaker at 180.°C than at 120.°C.

The forces are stronger at 120°C.

The IMF is stronger at the lower temperature.

The liquid has stronger IMF than the gas.

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

Potential energy: decreases

Average kinetic energy: no change

Potential energy: There is a decrease.

Average kinetic energy: It remains the same.

63 [1] Allow 1 credit for 0.500 mol *or* any value from 0.500 mol to 0.501 mol, inclusive.

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

Change in pressure: increases
Change in temperature: higher

Change in pressure: any pressure greater than 0.5 atm
Change in temperature: any temperature above 298 K

65 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

$$V = \frac{(24.5 \text{ L})(265 \text{ K})(0.500 \text{ atm})}{(298 \text{ K})(1.00 \text{ atm})}$$
$$\frac{(0.500 \text{ atm})(24.5 \text{ L})}{298 \text{ K}} = \frac{(1.00 \text{ atm})V}{265 \text{ K}}$$
$$\frac{(24.5)(265)(0.5)}{298}$$

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 liquid *or* (ℓ).

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



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

Ge

germanium

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

$$\frac{5.5 \text{ g/cm}^3 - 5.3234 \text{ g/cm}^3}{5.3234 \text{ g/cm}^3} \times 100$$

$$\frac{(5.5 - 5.3)(100)}{5.3}$$

$$\frac{0.2}{5.3} \times 100$$

70 [1] Allow 1 credit for alcohol *or* alcohols.

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

The rate of the forward reaction equals the rate of the reverse reaction.

Both reactions occur at the same rate.

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

More $\text{H}_2(\text{g})$ molecules collide with $\text{CO}(\text{g})$ molecules, producing more $\text{CH}_3\text{OH}(\text{g})$.

Adding H_2 increases the number of effective collisions to produce more methanol.

A greater number of effective collisions occur.

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

Rate of forward reaction: decreases/slower

Rate of reverse reaction: decreases/slower

74 [1] Allow 1 credit for $\text{C}_{18}\text{H}_{32}\text{O}_2$. The order of the elements may vary.

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

covalent

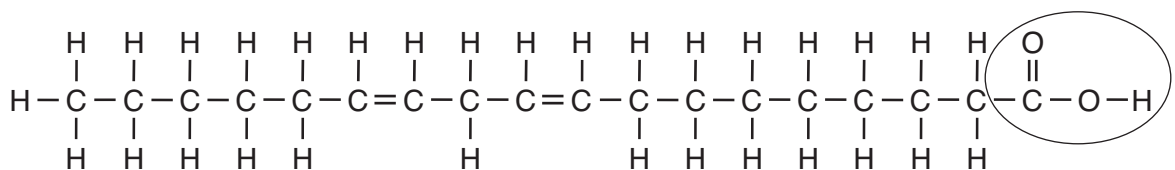
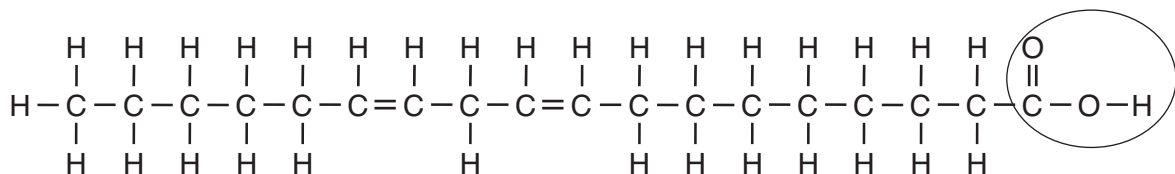
polar covalent

polar covalent bond

sigma bond

76 [1] Allow 1 credit.

Examples of 1-credit responses:



- 77 [1] Allow 1 credit for $\underline{2}$ H₂(g) + _____ O₂(g) → $\underline{2}$ H₂O(g) + energy. Allow credit even if the coefficient “1” is written in front of O₂(g).
- 78 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- From 0 to -2
 - From 0 to 2-
 - From zero to negative 2
- 79 [1] Allow 1 credit for 5.0 mol *or* 5 mol.
- 80 [1] Allow 1 credit for 2 *or* two.
- 81 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- 1.0 × 10⁻⁴ M
 - 0.0001 M
- 82 [1] Allow 1 credit for 30. mL *or* 30 mL.
- 83 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- As the seawater becomes more acidic, the solubility of CaCO₃ increases.
 - As the pH of the seawater decreases, the solubility of calcium carbonate increases.
 - solubility increases
 - more soluble
- 84 [1] Allow 1 credit for blue.
- 85 [1] Allow 1 credit for 6 *or* six.

Regents Examination in Physical Setting/Chemistry

June 2018

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

The *Chart for Determining the Final Examination Score for the June 2018 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Wednesday, June 20, 2018. 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

June 2018 Physical Setting/Chemistry

Question Numbers

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