FOR TEACHERS ONLY

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

PS–P

PHYSICAL SETTING/PHYSICS

Thursday, June 21, 2007 — 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. 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.emsc.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

1 . . . . . **1**	13 . . . . . **2**	25 . . . . . **2**
2 . . . . . **1**	14 . . . . . **3**	26 . . . . . **4**
3 . . . . . **2**	15 . . . . . **1**	27 . . . . . **3**
4 . . . . . **4**	16 . . . . . **2**	28 . . . . . **3**
5 . . . . . **2**	17 . . . . . **4**	29 . . . . . **1**
6 . . . . . **2**	18 . . . . . **4**	30 . . . . . **1**
7 . . . . . **2**	19 . . . . . **1**	31 . . . . . **4**
8 . . . . . **4**	20 . . . . . **3**	32 . . . . . **2**
9 . . . . . **3**	21 . . . . . **1**	33 . . . . . **1**
10 . . . . . **1**	22 . . . . . **3**	34 . . . . . **3**
11 . . . . . **4**	23 . . . . . **3**	35 . . . . . **1**
12 . . . . . **3**	24 . . . . . **1**	

Part B–1

36 . . . . . **2**	42 . . . . . **2**
37 . . . . . **1**	43 . . . . . **4**
38 . . . . . **2**	44 . . . . . **1**
39 . . . . . **3**	45 . . . . . **3**
40 . . . . . **3**	46 . . . . . **1**
41 . . . . . **4**	

Directions to the Teacher

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

Use only *red* ink or *red* pencil in rating Regents papers. Do not attempt to *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 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.

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.

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 on the written test 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 Thursday, June 21, 2007. 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.

Please refer to the Department publication *Regents Examination in Physical Setting/Physics: Rating Guide for Parts B–2 and C*. This publication can be found on the New York State Education Department web site http://www.emsc.nysed.gov/osa/scire/scirearch/phyratg02.pdf. Teachers should become familiar with this guide before rating students' papers.

Scoring Criteria for Calculations

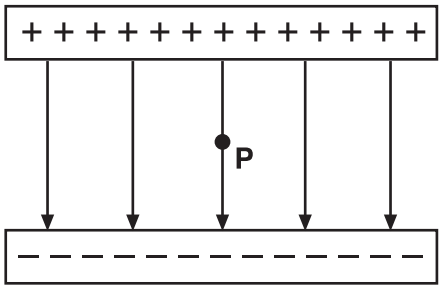
For each question requiring the student to show *all calculations, including the equation and substitution with units*, apply the following scoring criteria:

- Allow 1 credit for the equation and substitution of values with units. If the equation and/or substitution with units is not shown, do *not* allow this credit.
- Allow 1 credit for the correct answer (number and unit). If the number is given without the unit, do *not* allow this credit.
- Penalize a student only once per equation for omitting units.
- Allow full credit even if the answer is not expressed with the correct number of significant figures.

Part B–2

47 [1] Allow 1 credit for drawing *at least five* straight parallel lines perpendicular to the plates and pointing toward the negative plate. The lines must originate and end on the plates.

Example of a 1-credit response:



Note: Curved lines beyond the edges of the plates are acceptable.
Parallel lines need not be equally spaced.

48 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$$E = \frac{F_e}{q}$$

$$F_e = Eq$$

$$F_e = (2.0 \times 10^3 \text{ N/C})\ (1.6 \times 10^{-19} \text{ C})$$

$$F_e = 3.2 \times 10^{-16} \text{ N}$$

[4]

49 [1] Allow 1 credit for correctly determining all four wavelengths, as shown below.

Data Table	
Frequency (Hz)	**Wavelength** (m)
1.0	6.0
2.0	3.0
3.0	2.0
6.0	1.0

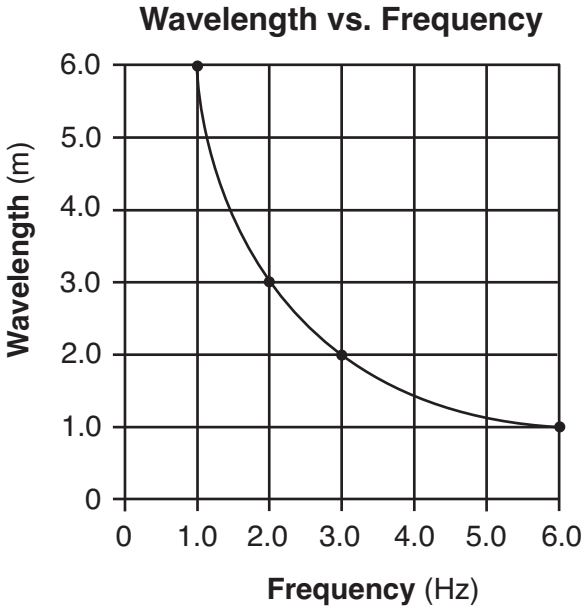
50 [1] Allow 1 credit for correctly plotting all four data points (± 0.3 grid space).

Note: Allow credit for an answer that is consistent with the student's response to question 49.

51 [1] Allow 1 credit for drawing the best-fit curve.

Note: Allow credit for an answer that is consistent with the student's response to question 50.

Example of a 2-credit response for questions 50 and 51:



52 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$A_x = A \cos \theta$

$F_x = (60.\ \text{N}) \cos 30.°$

$F_x = 52\ \text{N}$

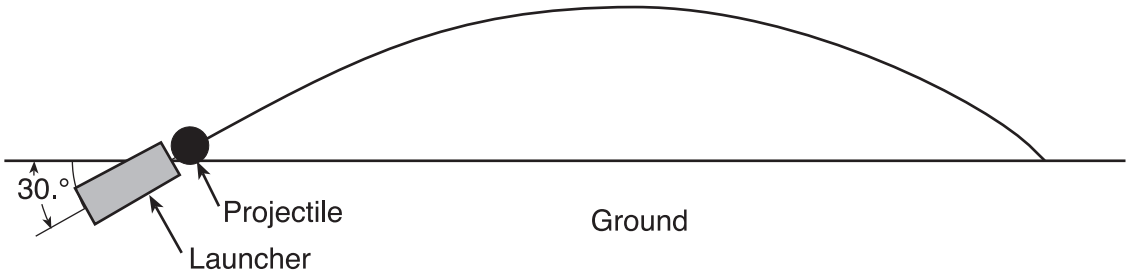
53 [1] Allow 1 credit for 52 N *or* an answer that is consistent with the student's response to question 52.

54 [2] Allow a maximum of 2 credits, 1 credit for indicating that the kinetic energy decreases and 1 credit for indicating that internal energy increases.

Note: Do *not* allow credit for indicating that kinetic energy changes into potential energy.

55 [1] Allow 1 credit for a parabolic-shaped path.

Example of a 1-credit response:



56 [1] Allow 1 credit for indicating that the projectile's maximum altitude will increase.

57 [1] Allow 1 credit for indicating that the total horizontal distance will increase.

58 [1] Allow 1 credit for 2.4 Ω.

59 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$$R = \frac{V}{I}$$
$$I = \frac{V}{R}$$
$$I = \frac{12\ V}{3.0\ \Omega}$$
$$I = 4.0\ \text{A}$$

60 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Examples of 2-credit responses:

$$R = \frac{V}{I}$$
$$R = \frac{12\ V}{1.0\ \text{A}}$$
$$R = 12\ \Omega$$

or

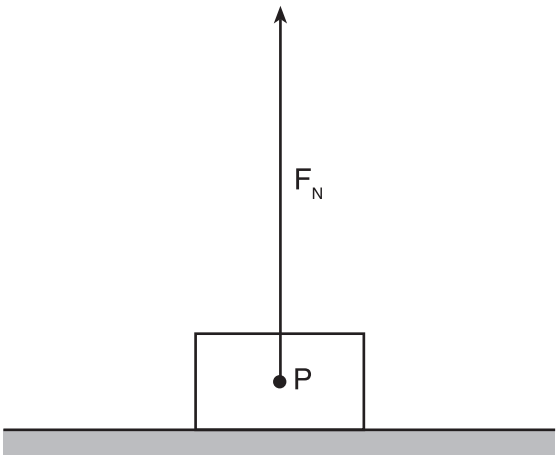
$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$$
$$\frac{1}{R} + \frac{1}{3\ \Omega} = \frac{1}{2.4\ \Omega}$$
$$R = 12\ \Omega$$

Note: Allow credit for an answer that is consistent with the student's response to question 58 and/or question 59.

Part C

61 [1] Allow 1 credit for drawing and labeling a vector 5.0 cm (± 0.2 cm) long, directed upward. Do *not* allow credit if the vector is not labeled or is missing the arrowhead.

Example of a 1-credit response:



Note: Allow credit if the student draws the correct vector from the box and *not* from point *P*.

62 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$F_f = \mu F_N$
$F_f = (0.30)(20.\ \text{N})$
$F_f = 6.0\ \text{N}$

63 [1] Allow 1 credit for 2.0 N *or* an answer that is consistent with the student's response to question 62.

64 [1] Allow 1 credit for 2.0 kg.

65 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$a = \frac{F_{net}}{m}$

$a = \frac{2.0\ \text{N}}{2.0\ \text{kg}}$

$a = 1.0\ \text{m/s}^2$

Note: Allow credit for an answer that is consistent with the student's responses to questions 63 and 64.

66 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$PE_s = \frac{1}{2}kx^2$

$PE_s = \frac{1}{2}(150\ \text{N/m})(0.050\ \text{m})^2$

$PE_s = 0.19\ \text{J}$ *or* $1.9 \times 10^{-1}\ \text{J}$ *or* $0.1875\ \text{J}$

67 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$\Delta PE = mg\Delta h$

$\Delta h = \frac{\Delta PE}{mg}$

$\Delta h = \frac{0.19\ \text{J}}{0.020\ \text{kg}\left(9.81\ \text{m/s}^2\right)}$

$\Delta h = 0.97\ \text{m}$

Note: Allow credit for an answer that is consistent with the student's response to question 66.

68 [1] Allow 1 credit for 17° ± 2°.

69 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$\sin \theta_2 = \frac{n_1 \sin \theta_1}{n_2}$$

$$\sin \theta_2 = \frac{1.00 \sin 17°}{1.46}$$

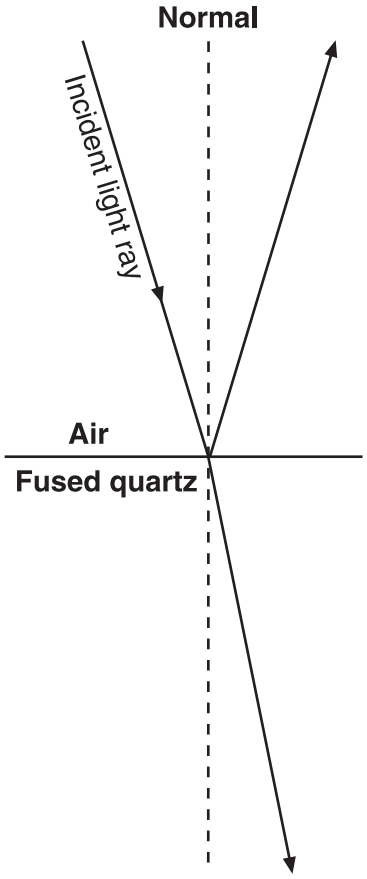
$$\theta_2 = 12° \textit{ or } 11.6°$$

Note: Allow credit for an answer that is consistent with the student's response to question 68.

70 [1] Allow 1 credit for drawing the refracted ray at an angle of 12° ± 2°, *or* an answer that is consistent with the student's response to question 69.

71 [1] Allow 1 credit for drawing the reflected ray at an angle of 17° ± 2°, *or* an answer that is consistent with the student's response to question 68.

Example of a 2-credit response for questions 70 and 71:



Note: Rays do *not* have to have arrows to receive credit.

72 [2] Allow a maximum of 2 credits. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 2-credit response:

$E_{photon} = hf$

$E_{photon} = (6.63 \times 10^{-34}\ \text{J•s})\ (5.02 \times 10^{14}\ \text{Hz})$

$E_{photon} = 3.33 \times 10^{-19}\ \text{J}$

73 [1] Allow 1 credit for 2.08 eV *or* an answer that is consistent with the student's response to question 72.

74 [1] Allow 1 credit for $n = 3$ *or* an answer that is consistent with the student's response to question 73.

Regents Examination in Physical Setting/Physics

June 2007

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

The *Chart for Determining the Final Examination Score for the June 2007 Regents Examination in Physical Setting/Physics* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Thursday, June 21, 2007. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Physics must NOT be used to determine students' final scores for this administration.

On-line 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 on-line 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 www.emsc.nysed.gov/osa/exameval.
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 2007 Physical Setting/Physics			
Question Numbers			
Key Ideas	Part A	Part B	Part C
Standard 1			
Math Key Idea 1	2,7,8,9,11,12,14,17,19,20, 25,35	38,39,40,48,59,60	62,63,64,65,66,69, 72,73
Math Key Idea 2		41,43,44	
Math Key Idea 3		46	
Sci. Inq. Key Idea 1			
Sci. Inq. Key Idea 2			
Sci. Inq. Key Idea 3	11	40,49,50,51	67,68
Eng. Des. Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1			
Key Idea 2	4,18,22,23,29	47,55,56,57	61,68,70,71
Key Idea 3		36	
Key Idea 4		53	
Key Idea 5			
Key Idea 6			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
4.1	16,18	43,44,54,58	67
4.3			68,69,70,71
5.1	6,7	42,52,55	61
5.3		45	74
Standard 4			
4.1	11,12,13,15,16,17,18,19,20	43,44,54,58,59,60	66,67
4.3	21,22,23,24,25,26,27,28,29 ,30,31	49,50,51	68,69,70,71
5.1	1,2,3,4,5,6,7,8,9,10,14	38,39,40,41,42,47, 48,52,53,55,56,57	61,62,63,64,65
5.3	32,33,34,35	45,46	72,73,74