

Part III (15 credits)

Please refer to the Department publication *Regents Examination in Physics: Rating Guide for Part III*. 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 a total of two credits for questions 117, 120, and 125.

- Allow one 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 one 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.

116 Allow one credit.

$$24 \text{ m} \pm 1 \text{ m}$$

If the number is given without the unit do not allow this credit.

117 Allow a total of two credits. Refer to *Scoring Criteria for Calculations* in this scoring key.

Examples of Acceptable Responses

$$\Delta PE = mg\Delta h$$

$$\Delta PE = (650 \text{ kg})(9.8 \text{ m/s}^2)(24 \text{ m})$$

$$\Delta PE = 152, 880 \text{ kg}\cdot\text{m}^2/\text{s}^2$$

or

$$\Delta PE = 1.5 \times 10^5 \text{ J}$$

Allow credit for an answer that is consistent with the student's answer to question 116.

118 Allow one credit. To receive this credit, the response must be written in one or more complete sentences.

Examples of Acceptable Responses

The kinetic energy of the car at the top of the second hill is less than the kinetic energy of the car at the top of the third hill.

or

The car's *KE* is less.

119 Allow a total of two credits.

- Allow one credit for three lines drawn from point A to point B. The lines may consist of one straight line and two curved lines or three curved lines.
- Allow one credit for three arrowheads, one on each line pointing in the direction of point B.
- Do not penalize a student for additional electric field lines with arrowheads drawn correctly.

Examples of Responses

[See the back of the Scoring Key for Part I]

120 Allow a total of two credits. Refer to *Scoring Criteria for Calculations* in this scoring key.

Examples of Acceptable Responses

$$F = \frac{kq_1q_2}{r^2}$$

$$F = \frac{\left(9.0 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2}\right)(2.4 \times 10^{-6} \text{ C})(2.4 \times 10^{-6} \text{ C})}{(0.50 \text{ m})^2}$$

$$F = 0.21 \text{ N}$$

or

$$F = \frac{kq_1q_2}{r^2}$$

$$F = \frac{\left(9.0 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2}\right)(2.4 \times 10^{-6} \text{ C})^2}{(0.50 \text{ m})^2}$$

$$F = 2.1 \times 10^{-1} \text{ N}$$

Do not penalize a student for using the actual values for the charges and calculating a negative value for the force.

PHYSICS — *continued*

Part II

Allow a total of 20 credits, one credit for each question, for only two of the six groups in this part. If more than two groups are answered, only the first two should be considered.

Group 1
Motion in a Plane

- 56 1 2 4
 57 1 3 4
 58 2 3
 59 1 2 3
 60 2 3 4
 61 1 2 3
 62 1 3
 63 2 3 4
 64 1 2 4
 65 1 2

Group 3
Electromagnetic Applications

- 76 1 3 4
 77 1 2 4
 78 1 2 4
 79 1 2 3
 80 1 3 4
 81 1 2 3
 82 2 3 4
 83 2 3 4
 84 1 3 4
 85 1 3 4

Group 5
Solid State

- 96 1 2 4
 97 1 2 3
 98 1 2 4
 99 1 2 3
 100 2 3 4
 101 2 3 4
 102 1 3 4
 103 1 3 4
 104 1 2 4
 105 1 3

Group 2
Internal Energy

- 66 1 2 3
 67 1 3 4
 68 2 3 4
 69 1 2 3
 70 1 2 4
 71 1 2 4
 72 2 3 4
 73 1 3 4
 74 1 2 3
 75 1 3 4

Group 4
Geometric Optics

- 86 1 2 3
 87 2 3 4
 88 1 2 4
 89 2 3 4
 90 2 3 4
 91 1 2 4
 92 1 2 3
 93 1 2 3
 94 2 3 4
 95 1 3 4

Group 6
Nuclear Energy

- 106 1 2 4
 107 2 3 4
 108 1 2 3
 109 1 3 4
 110 1 3 4
 111 2 3 4
 112 1 2 4
 113 1 2 3
 114 1 2 4
 115 2 3 4

FOR TEACHERS ONLY

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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

PHYSICS

Wednesday, June 21, 2000—9:15 a.m. to 12:15 p.m., only

SCORING KEY

Part I

Refer to the table on the answer paper for the number of credits to be given on Part I.

Part I (65 credits)

1	1	2	X	4	21	1	2	X	4	41	1	2	3	X
2	X	2	3	4	22	1	2	3	X	42	1	2	X	4
3	1	X	3	4	23	1	2	X	4	43	1	2	3	X
4	1	2	3	X	24	1	X	3	4	44	1	X	3	4
5	1	2	X	4	25	1	X	3	4	45	1	2	X	4
6	1	2	X	4	26	1	2	X	4	46	1	X	3	4
7	1	X	3	4	27	1	2	3	X	47	1	2	X	4
8	1	2	3	X	28	X	2	3	4	48	1	2	X	4
9	1	2	X	4	29	X	2	3	4	49	X	2	3	4
10	1	2	3	X	30	1	2	3	X	50	X	2	3	4
11	X	2	3	4	31	X	2	3	4	51	1	2	3	X
12	1	X	3	4	32	1	2	3	X	52	X	2	3	4
13	1	2	3	X	33	1	X	3	4	53	1	X	3	4
14	1	X	3	4	34	1	X	3	4	54	X	2	3	4
15	1	2	3	X	35	X	2	3	4	55	1	X	3	4
16	1	2	X	4	36	1	2	X	4					
17	1	X	3	4	37	1	2	X	4					
18	1	2	3	X	38	X	2	3	4					
19	X	2	3	4	39	1	X	3	4					
20	1	2	X	4	40	1	2	3	X					

Directions to the teacher:

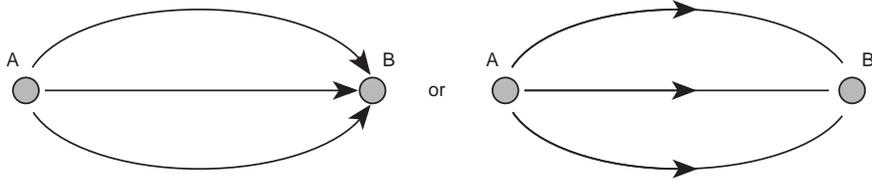
Use only *red* ink or *red* pencil in rating Regents examination papers. Do not correct the student's work by making insertions or changes of any kind.

Scan each answer paper to make certain that the student has marked only one answer for each question. If a student has marked two or more answers with an X in ink, draw a red line through the row of numbers for that question to indicate that no credit is to be allowed for that question when the answer paper is scored.

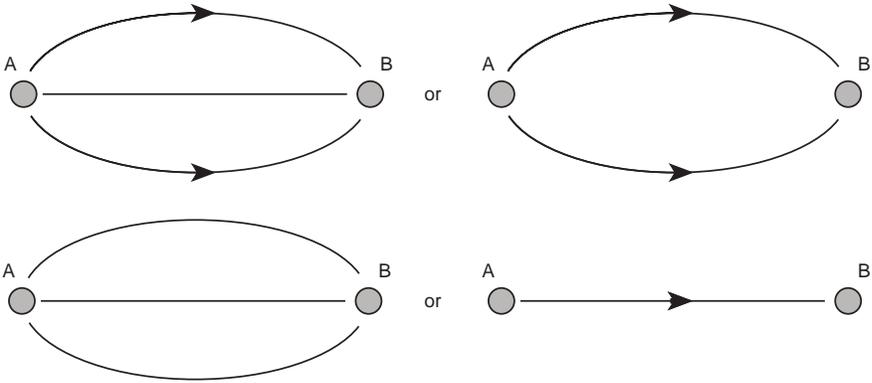
To facilitate scoring, the scoring key has been printed in the same format as the answer paper. The scoring key for **Part I and Part II** may be made into a scoring stencil by punching out the correct answers. Be sure that the stencil is aligned with the answer paper so that the holes correspond to the correct answers. To aid in proper alignment, punch out the first and last item numbers in each part and place the stencil on the answer paper so that these item numbers appear through the appropriate holes.

[OVER]

119 Examples of Two-Credit Responses

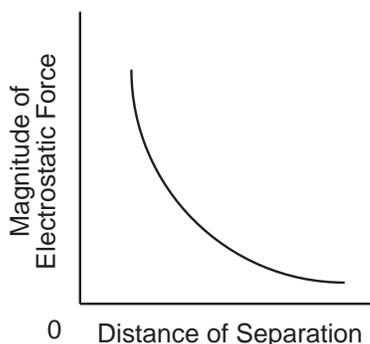


Examples of One-Credit Responses



121 Allow one credit.

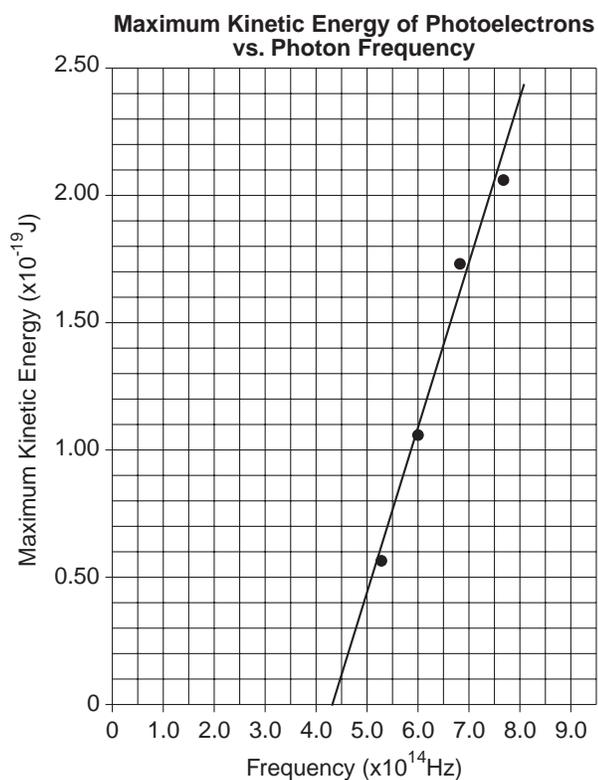
Example of Acceptable Response



Do not allow this credit if the curve intersects either axis.

Do not allow this credit if the sketch is a straight line.

122–123 Example of Acceptable Response



122 Allow one credit.

All points must be plotted accurately (± 0.3 grid space).

123 Allow one credit.

The best-fit line must be straight. If one or more points are plotted incorrectly in question 122, but a best-fit straight line is drawn, allow this credit.

124 Allow one credit.

Example of Acceptable Response

$$4.4 \times 10^{14} \text{ Hz} \pm 0.2 \times 10^{14} \text{ Hz}$$

Allow credit for an answer that is consistent with the student's answer to question 123, that is, where the student's best-fit line intercepts the horizontal axis $\pm 0.2 \times 10^{14} \text{ Hz}$.

125 Allow a total of two credits. Refer to *Scoring Criteria for Calculations* in this scoring key. Allow credit for an answer that is consistent with the student's graph, *unless* the student receives no credits for questions 122 and 123. In that case, credit may be awarded if the student correctly calculates the slope using data in the table.

Note: The slope may be determined by direct substitution of data points *only* if the data values are on the best-fit line.

Examples of Acceptable Responses

These responses are based on the assumption that the best-fit line passes through these coordinates.

$$\text{slope} = \frac{\Delta KE_{\text{max}}}{\Delta f}$$

$$\text{slope} = \frac{2.4 \times 10^{-19} \text{ J} - 0.4 \times 10^{-19} \text{ J}}{8.0 \times 10^{14} \text{ Hz} - 5.0 \times 10^{14} \text{ Hz}}$$

$$\text{slope} = 6.7 \times 10^{-34} \text{ J}\cdot\text{s}$$

or

$$\text{slope} = 0.67 \times 10^{-33} \text{ J/Hz}$$

126 Allow one credit.

Planck's constant