



## AP<sup>®</sup> Physics B 2003 Scoring Commentary Form B

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**AP<sup>®</sup> PHYSICS B**  
**2003 SCORING COMMENTARY (Form B)**

**Question 1**

Sample 1 (Score 15)

This full-credit response uses the second relationship between distance and acceleration noted in the solution for part (b).

Sample 2 (Score 9)

This response loses one point in part (a) for the incorrect “ $f_{\text{restoring}}$ ”, and no points are earned for part (c).

**Question 2**

Sample 1 (Score 15)

This student almost makes a mistake in part (d), initially calculating the resistance required to drop 9 volts at 1 milliamp. Then the student realizes that the correct potential difference is 6 volts.

Sample 2 (Score 13)

This response earns full credit until part (d). There, the response includes the mistake that was crossed out in the previous sample. In part (b), the power equation is not used directly, but its equivalent is derived.

**Question 3**

Sample 1 (Score 15)

Although the calculation for part (d) is incorrect, the student’s ray diagram is correct. The response to part (e) is consistent with both the diagram and the numerical result in (d), so this response earned full credit.

Sample 2 (Score 12)

This student does not explicitly refer to the given scale as required in part (d). Part (e) can earn no credit, since no explanations are included.

**Question 4**

Sample 1 (Score 15)

This student adds a description of the electron path to make the intent clear.

Sample 2 (Score 12)

In drawing the forces in part (a) ii., the student clearly shows the electric force  $qE$  upward, which is incorrect, and so the “repulsion” vector does not receive credit. No credit is earned for part (e).

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**Question 5**

Sample 1 (Score 10)

This paper has very good responses to the last two parts.

Sample 2 (Score 8)

Part (c) earns no credit, but the rest of the response is correct, although the response to part (e) is not as elegant as the previous sample.

**Question 6**

Sample 1 (Score 10)

Although not required, this student actually shows a calculation in part (b) ii as an explanation of how the pressure can be determined. While there are some mathematical mistakes, the correct procedure was used.

Sample 2 (Score 7)

In part (a) i., the student has the basic principle correct, but makes an error in the use of the 50 m height. The next two parts receive full credit, but the last part is incorrect.

**Question 7**

Sample 1 (Score 10)

This response contains the energy level diagram shown in the top illustration of the scoring guide.

Sample 2 (Score 8)

This response contains the second possible energy level diagram. No wavelength is given in part (b), so only one point is earned there.