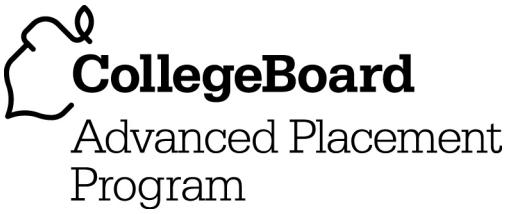

AP® Physics B
2004 Scoring Commentary
Form B

AP® PHYSICS B
2004 SCORING COMMENTARY (Form B)

Question 1

Sample: A
Score: 14

This paper only lost one point, in part (d). Instead of indicating that the work is negative, the student ascribes a direction to it.

Sample: B
Score: 10

This paper lost one point in part (b) for the extraneous centripetal force. In part (c), the relative signs of the forces are wrong, so only one point was earned. This student also missed the negative sign in part (d). In part (e), the justification does not refer back to the force equation, and so only 2 points were earned there.

AP® PHYSICS B
2004 SCORING COMMENTARY (Form B)

Question 2

Sample: A
Score: 15

In part (b), this student uses the alternate method of calculating the pressure and then multiplying that by the area.

Sample: B
Score: 10

In part (a), the student used the wrong distance for the constant speed portion, and only earned 2 points. In part (c), the student subtracts the internal bell pressure instead of adding atmospheric pressure, and only earned 1 point. The wrong pressure is used in part (d), so one point was lost there.

AP® PHYSICS B
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Question 3

Sample: A
Score: 15

This is a good example of a concise, completely correct paper.

Sample: B
Score: 12

Only 2 points were earned for part (a) since the difference in resonance lengths was set equal to a whole wavelength instead of a half wavelength. Part (d) also earned only 2 points because a full wavelength was added instead of a half wavelength.

Question 4

Sample: A
Score: 15

This paper earned full credit on all the parts to the question. One of the alternate solutions was used for part (d). The justification for the correct answer to part (e) is very complete and clearly written.

Sample: B
Score: 9

In part (a), one point was lost for failing to multiply the induced emf per turn by the number of turns to get the total emf. In part (b), credit was given for the numerical answer because it was consistent with the answer to part (a), but one point was lost for the wrong direction. Part (c) received full credit, again for consistency with previous answers. Part (d) received only the point for the correct expression for the force on a straight wire; the wrong value was substituted for the length of the left side of one of the loops, and again the answer did not take into account the 20 turns in the coil. Part (e) also received only one point for recognizing just one of the two effects that doubling the number of turns in the coil would have on the current.

Question 5

Sample: A
Score: 10

This paper earned full credit on all the parts to the question. Points *B* and *C* were compared in determining the answer to part (b). The justifications in part (d) were very well written, using the first law of thermodynamics to determining whether *Q* was positive or negative in each of the three processes.

Sample: B
Score: 7

This paper received full credit for part (a) and for a clearly written answer to part (d) that shows a good understanding of the concepts involved. However, in part (b), the subscripts for the temperatures at points *B* and *C* were interchanged resulting in an incorrect answer, thus earning no points. An additional point was lost in part (c) for using the incorrect pressure and for failing to calculate a final answer.

Question 6

Sample: A
Score: 10

This paper earned full credit on all the parts to the question. The answers are clearly presented, although part (d) could have been done with less calculation by deriving a symbolic answer before substituting numerical values.

Sample: B
Score: 8

This paper earned full credit on parts (a), (b), and (c). No points were awarded for part (d) because only the energy of the scattered photon was computed; this energy should have been subtracted from the energy of the incident photon in order to determine the energy imparted to the recoiling nucleus.