

Commentary on candidate 1 evidence

The evidence for this candidate has achieved the following marks for each question of this course assessment component.

Question 1(a)(i)(A)

The candidate was awarded **1 mark** because the horizontal component of the initial velocity of the sponge has been correctly calculated.

Question 1(a)(i)(B)

The candidate was awarded **1 mark** because the vertical component of the initial velocity of the sponge has been correctly calculated.

Question 1(a)(ii)

The candidate was awarded **2 marks** because they have selected an appropriate relationship and substituted data correctly. They have correctly calculated an answer, but have done further working resulting in an incorrect final answer.

Question 1(a)(iii)

The candidate was awarded **1 mark** because they have selected an appropriate relationship, but substituted data incorrectly. The remaining marks cannot be accessed.

Question 1(b)

The candidate was awarded **1 mark** because they have made a correct statement about the increase in vertical velocity, but 'go past the teacher' is not a sufficiently detailed explanation for the second mark to be awarded.

Question 2(a)(i)

The candidate was awarded **0 marks** because they have not selected an appropriate relationship. The mark for substitution and the mark for the final answer cannot be accessed.

Question 2(a)(ii)

The candidate was awarded **3 marks** because a correct relationship has been selected, correct substitution of data has been made, and a correct final answer has been stated.

Question 2(a)(iii)

The candidate was awarded **0 marks** because their description of the subsequent motion of the drone is not sufficiently detailed, and so the mark for justification cannot be accessed.

Question 2(b)

The candidate was awarded **0 marks** because their chosen method of solution is incorrect and so no marks can be awarded.

Question 3(a)

The candidate was awarded **0 marks**. The scored out working has not been replaced, and so is marked. The candidate has not selected an appropriate relationship. The mark for substitution and the mark for final answer cannot be accessed.

Question 3(b)

The candidate was awarded **0 marks** because they have not selected an appropriate relationship. The mark for substitution and the mark for final answer cannot be accessed.

Question 3(c)

The candidate was awarded **0 marks** because they have not specified *total* kinetic energy and so neither mark can be awarded.

Question 4

The candidate was awarded **1 mark** because they have shown a limited understanding of the physics involved. A number of statements are made, which are relevant to the context.

Question 5(a)

The candidate was awarded **0 marks** because their statement 'redshift' is not sufficiently detailed to answer the question.

Question 5(b)(i)

The candidate was awarded **1 mark** because they have substituted data correctly into the given relationship, but have not given an acceptable final answer in years.

Question 5(b)(ii)(A)

The candidate was awarded **0 marks** because their response is not sufficiently detailed.

Question 5(b)(ii)(B)

The candidate was awarded **1 mark** because their suggestion is valid.

Question 5(c)

The candidate was awarded **1 mark** because their response is correct.

Question 6(a)(i)

The candidate was awarded **2 marks** because they have explicitly stated the appropriate selected relationship, substituted the data correctly, and stated the given final answer.

Question 6(a)(ii)

The candidate was awarded **3 marks** because they have selected an appropriate relationship, substituted data correctly, and given the correct final answer.

Question 6(b)

The candidate was awarded **0 marks** because they have not stated a change that would be observable on the screen.

Question 6(c)

The candidate was awarded **1 mark** because they have shown a limited understanding of the physics involved.

Question 7(a)

The candidate was awarded **0 marks** because the suggestion does not make reference to photons.

Question 7(b)(i)

The candidate was awarded **1 mark** because their statement is correct.

Question 7(b)(ii)

The candidate was awarded **1 mark** because their statement on the effect on the maximum kinetic energy is correct. The justification, however, lacks the level of detail necessary for the second mark to be awarded.

Question 7(c)

The candidate was awarded **1 mark** because they have shown a lower threshold frequency. Their line, however, is not parallel to the given line, and so the second mark is not awarded.

Question 7(d)

The candidate was awarded **0 marks** because their explanation does not contain the detail necessary for the mark to be awarded.

Question 8(a)(i)

The candidate was awarded **1 mark** because their explanation is acceptable.

Question 8(a)(ii)

The candidate was awarded **1 mark** because an appropriate relationship has been selected, but an incorrect substitution has been made for d . The mark for the final answer cannot be accessed.

Question 8(a)(iii)

The candidate was awarded **0 marks** because their statement is incorrect and so the mark for justification cannot be accessed.

Question 8(a)(iv)

The candidate was awarded **0 marks** because their statement is incorrect. The phrase 'constant phase relationship' is required for the mark to be awarded.

Question 8(b)

The candidate was awarded **0 marks** because their suggestion is not sufficiently detailed for the mark to be awarded.

Question 9(a)

The candidate was awarded **2 marks** because they have explicitly stated the appropriate selected relationship, substituted the data correctly, and stated the given final answer.

Question 9(b)(i)

The candidate was awarded **0 marks** because their statement is incorrect.

Question 9(b)(ii)

The candidate was awarded **3 marks** because they have selected an appropriate relationship, substituted data correctly, and given the correct final answer.

Question 9(b)(iii)

The candidate was awarded **0 marks** because they have not shown the angle of incidence on the right hand face of the prism as 38° , shown total internal reflection, or shown the required details of the refraction at the bottom face of the prism.

Question 9(c)

The candidate was awarded **1 mark** because their statement about the 'width' of the spectrum is acceptable.

Question 10(a)

The candidate was awarded **1 mark** because their response covers one of the features of the Bohr model.

Question 10(b)

The candidate was awarded **3 marks** because they have selected an appropriate relationship, substituted data correctly, and given the correct final answer.

Question 10(c)

The candidate was awarded **5 marks** because they have selected appropriate relationships, correctly substituted data into both relationships, and given the correct final answer.

Question 11(a)

The candidate was awarded **0 marks** because their statement is incorrect. The statement 'charge passing through the circuit' is wrong physics, energy is gained and lost as charge passes through the circuit.

Question 11(b)

The candidate was awarded **0 marks** because their initial statement 'Ir = gradient' is incorrect. The remaining marks cannot be accessed.

Question 11(c)

The candidate was awarded **0 marks** because their initial statement does not contain sufficient detail for the mark to be awarded.

Question 12(a)(i)

The candidate was awarded **1 mark** because the peak voltage of the output of the signal generator has been correctly determined.

Question 12(a)(ii)

The candidate was awarded **3 marks** because they have selected an appropriate relationship, substituted data correctly, and given the correct final answer.

Question 12(a)(iii)

The candidate was awarded **1 mark** because their response covers part of the full explanation, corresponding to 'LEDs will conduct in only one direction'.

Question 12(b)

The candidate was awarded **1 mark** because they have selected an appropriate relationship ($V_{\text{peak}} = \sqrt{2}V_{\text{rms}}$), but have attempted to determine V_{peak} by substituting data incorrectly into the Ohm's law relationship. The remaining marks cannot be accessed.

Question 13(a)

The candidate was awarded **2 marks** because they have substituted data correctly into the given relationship and given an acceptable final answer.

Question 13(b)(i)

The candidate was awarded **3 marks** because they have appropriately scaled and labelled the axes with variables and units, plotted the data points accurately (within the $\pm \frac{1}{2}$ division tolerance), and drawn an acceptable line of best fit.

Question 13(b)(ii)

The candidate was awarded **0 marks** because they substituted incorrect data into the gradient relationship. The data point (0.50, 6.2) does not lie on the line of best fit (within the $\pm \frac{1}{2}$ division tolerance). The mark for the final answer cannot be accessed.

Question 13(b)(iii)

The candidate was awarded **1 mark** because they have substituted correctly into the given relationship. Possibly by good fortune, the data point (0.10, 1.2) used in the substitution lies on the line of best fit and the line of best fit passes through the origin. The final answer, however, is incorrect.