Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel Advanced Subsidiary

In Physics (8PH0) Paper 02 Core Physics II

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Introduction

This paper assessed topic 4, Materials, and topic 5, Waves and Particle Nature of Light. The paper provided candidates with the opportunity to demonstrate progression from GCSE and consolidate their knowledge at the end of the first year of the AL qualification.

Section A, a total of 58 marks, consisted of 8 multiple-choice questions and questions of differing style and length, drawing on a range of different concepts, from topics 4 and 5. Section B, a total of 22 marks, consisted of two synoptic questions drawing on content from the whole of the AS specification.

Practical skills and knowledge of aspects of each of the core practicals were assessed throughout. Application of practical skills was also assessed in other familiar or unfamiliar contexts.

Section A

	Comment	Percentage of correct responses
Q1	S.I. units for the quantity of intensity Common incorrect response: B	73 %
Q2	Core practical 8 All incorrect responses were observed	83 %
Q3	Hookes law applied to springs connected in parallel Common incorrect response: D	82 %
Q4	Constructive interference of waves Common incorrect response: A	62 %
Q5	Phase difference Common incorrect response: B	72 %
Q6	Photoelectric effect All incorrect responses were observed	67 %
Q7	Core practical 4 Common incorrect response: C	73 %
Q8	Forces on an object falling through a fluid All incorrect responses were observed	81 %

Question 9(a)

Most candidates failed to recall a definition of polarisation. The mark more commonly scored was mp1 relating to oscillations/vibrations. The idea of the direction of the propagation of the wave being contained within the same plane as the oscillations evaded most candidates.

Question 9(b)(i)

Most candidates knew that the filters needed to be perpendicular to each other. For mp2 common incorrect answers simply repeated the question "so no light is observed". What was needed was the idea that the component of light that is transmitted by the first filter is absorbed by the other. Whilst the use of the term component was not essential, the ability to use it gave candidates help with writing a clear explanation.

Question 9(b)(ii)

Many candidates calculated a correct gradient. Following this the most common approach was to calculate kl with a comparison of the gradient to kl which was found to be out by a factor of 100. A comparison of the two calculations and a conclusion was needed for mp3

Question 10*

This question was based on a GCSE concept and so most candidates were able to access some marks, with nearly a quarter of candidates achieving at least 4 marks. Some common reasons for marks not being awarded included: no mention of pulses; referring to lightwaves (possibly recalling a question on an earlier paper); incorrect equation, either not rearranged for distance as the subject or incorrectly arranged. Most responses included a correct factor of 2.

Question 11(a)

Candidates tended to find this question challenging. Many did not realise that the displacement of particles at both a compression and a rarefaction is 0, and to translate this to the axes given.

Question 11(b)(i)

Over half of all candidates achieved full marks. Some tried to calculate the volume using the equation for the volume of a sphere. However, they could then still achieve mp2.

Question 11(b)(ii)

Candidates who identified the equations to be used here were generally successful at the question. Many struggled with mp1 (nearly 40 %) limiting the mark to 0 or 1. It was encouraging to see that many candidates remembered that the wavelength was twice the length of the string.

Question 12(a)

Candidates were very successful at this 2-mark calculation.

Question 12(b)

Over half of all candidates achieved at least 2 marks by correctly calculating the angle of refraction at the air-glass interface. However, most candidates did not then realise that they needed to use trigonometry to determine the angle of incidence at the glass-air interface, and they tended to stop there. Those candidates who realised the need to use trigonometry remembered to invert the refractive index and were successful at this question, scoring all 5 marks.

Question 13(a)(i) and (ii)

Many candidates calculated the mean of the three values for extension, but some then treated this as the mean strain and incorrectly wrote 12.9 on the answer line. An alternative acceptable method was to calculate the strain using each of the three values for extension and to then calculate the mean strain. It was pleasing to see many candidates calculating the uncertainty correctly, although an appropriate unit was often omitted. Most gave this as 0.07, with 7 % rarely seen.

Question 13(a)(iii)

Around half of all candidates scored 4 marks. Some candidates did not refer to photons but only to radiation. Some candidates thought that electrons were being emitted.

Question 13(b)

Candidates struggled with using appropriate terminology to express their answers clearly and would often achieve the first mark of one of the mark scheme options but not the second. It is expected that candidates give an explanation using terms such as "force/load/stress/strain" and not simply make statements such as "the wire extends more easily".

Question 14(a)

The ray diagrams were generally drawn well. The main issue was not having the image in the final range because the error on the line drawing was too large. Most candidates achieved 3 or 4 marks.

Question 14(b)

Around a half of candidates achieved full marks on this multistep calculation.

Section B

Question 15(a)(i)

This is a common question on this paper but over a half of candidates failed to score. This could be due to the context, or the slight difference in the wording and emphasis of the question, and they failed to relate this to energy levels. There was confusion, with some, who thought this was the photoelectric effect. Of those who recognised this as relating to energy levels, some did not relate this to the difference in the energy between the levels, and others failed to refer to a photon.

Question 15(a)(ii)

Those who attempted this question were generally successful. The most common mistake was to switch the energy levels (3.39 to 1.51).

Question 15(a)(iii)

Candidates found this question challenging. Most did not link the rate of photons with intensity of radiation. Those who did realise this for mp2, often did not then explain this with the one-one relationship between an electron and a photon for mp1.

Question 15(b)

Candidates knew how to solve this multistep calculation, and it scored well. Marks were not given mainly through incorrect calculation rather than the method used. Some forgot to include a comparison and conclusion at the end.

Question 16(a)(i)

Not a difficult question to answer but a difficult context so many candidates failed to score.

Question 16(a)(ii)

A very challenging question with many candidates failing to score.

Question 16(b)(i)

Over 60 % scored 2 marks on this calculation with approximately 30 % failing to score. Some failed to use the mass of an electron which can be found from the data sheet.

Question 16(b)(ii)

A challenging question but nearly half of candidates scored 1 or 2. Mp1 was the more common mark awarded.

Summary

Based on their performance on this paper, students should:

- Revise how the rate of incident photons determines the intensity of light.
- Use of suitable terminology when giving an explanation.
- Revise energy levels and emission/absorption spectra.
- The displacement of particles along a longitudinal wave, to identify a compression and rarefaction.

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