Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel Advanced Subsidiary
In Physics (8PH0) Paper 01 Core Physics I

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Introduction

This paper is divided into two sections. Section A of the paper is worth 57 marks and consists of 8 multiple choice questions followed by 6 questions of increasing length comprising of short open, open-response, calculation and extended writing style questions.

Section A examines material from the topics Working as a Physicist, Mechanics and Electric Circuits. Section B is worth 23 marks on this paper and examines material from the whole AS specification. It contains two questions worth 7 and 16 marks including a data analysis question based on an unfamiliar experiment with light. Although this is not a core practical, it tests candidates' graph work, as well as practical skills applied to a new context. The other question in section B was a synoptic question based on light and electricity.

This paper enabled candidates of all abilities to apply their knowledge to a variety of styles of examination questions. Many candidates showed a good progression from GCSE to AS level, with prior knowledge extended and new concepts taught and understood well. The longer calculation questions were generally not answered well by many canddiates who found the multi-step approach challenging. Some questions were not answered as well as would have been expected by many learners. Q16c, using percentage uncertainties to assess data should have been a straightforward response, however although many candidates understood how to find a percentage uncertainty, their ability to combine these was limited. In the open response and the extended writing questions, candidates that had a sound understanding of the physics involved did not always demonstrate this in their responses due to a lack of precision when applying their knowledge to the context and poor use of subject specific language. However, learners from across the ability range managed to score some marks within these questions.

Timing was an issue for a small number of learners, usually due to spending a disproportionate amount of time answering the multiple-choice items. Q16 was mostly affected by this issue with some learners leaving the answer space blank.

Question 9

A 3-mark question based on interpreting a pd-current graph.
Good responses identified a filament lamp as the component used and were able to describe how the current varied with potential difference clearly. Common errors included identifying the component as a thermistor and describing the shape of the graph line, rather than clearly identifying the trend. Expressions such as 'the current levelled off' were frequently seen and were not awarded the first mark point.

Question 10(a)

This question was based on the equation for work done and involved a force at an angle to the direction of the motion. Errors commonly seen with this method included using the wrong trigonometric function when calculating the component of the force.

Question 10(b)

This question involved explaining why when the angle of the force changed, its magnitude decreased. Although most candidates knew that the force would decrease, few could explain why, with most simply discussing the horizontal component of the force without linking this to the direction the pram was moving in.

Question 11(a)

This question was a standard calculation involving a potential divider circuit. Most candidates were successful with this, with a fairly even split of candidates who chose to use the potential divider principle and those who chose to calculate the current and use this with R = V/I. Those who chose to calculate current were slightly more successful with this.

Question 11(b)

This question involved understanding the changes to the circuit when a motor was added in parallel with one component. Most candidates found this difficult, despite several similar questions over recent years. A common error was to assume that the current through the battery did not change and that when adding the motor, the current then split between the components in parallel. Some candidates also believed that the potential difference over this part of the circuit would not be changed by the addition of the motor.

Question 12(a)

This question was based on carrying a bookcase with two points of contact. This was a multi-step calculation based on moments. The candidates were expected to approach the calculation by taking moments about either A or B. In a similar question based on the forces on a bridge in a previous series many candidates did not realise this, however, in this question, most candidates attempted this approach with some success. Common errors arose from candidates being careless in the way they labelled their forces, and not recording which pivot point was being considered. This often resulted in candidates muddling up the force at A and the force at B. However, even if this was the case, candidates still scored some marks for processing. It was encouraging to see that nearly all candidates attempted the question with very few blanks seen.

Question 12(b)

This question involved the bookcase now being carried on an angle. Candidates found this much more difficult, and some misread the question and tried to explain what happened to move the bookcase from horizontal to the angle. Few candidates realised that the key was the change in the horizontal distance to the pivot, despite being given the hint that they should consider moments about A. Some candidates thought the weight force would now be an angle, an approach that did not normally enable them to score.

Question 13(a)

This was a 6-mark linkage question involving linking the motion of a projectile to the force on it. More successful candidates started by describing the distances shown on the diagram and discussing horizontal motion and vertical motion separately. Thos who did not consider the horizontal and vertical components separately found it hard to score. A common error was to use the word 'motion' from the stem instead of 'velocity'. Indeed, candidates would do well to remember that quoting from the question stem will not gain them marks.

Question 13(b)

This question involved a multi-step projectile calculation made more complex by the need to find both magnitude and direction of the initial velocity. Successful candidates divided up the data into vertical and horizontal groups to ensure that they only used data in one direction at a time. Common errors seen involved using the horizontal range in an equation intended to calculate a vertical component, leading to an incorrect value for the vertical component of the initial velocity. Some of these candidates were still able to gain the processing marks for combining the vertical and horizontal components, although their final answers were incorrect. A few candidates correctly found the components of the initial velocity, but then did not know how to combine them.

Question 14(a)(i)

This question involved the calculation of a power. Most candidates were successful, although some seemed confused in how to use the mass flow rate given. Remembering the definition of power as the rate of transfer of energy is key to answering this question confidently.

Question 14(a)(ii)

This question involved a description of energy transfers from the water as it flowed down the pipe. These questions inevitably involve using the phrase 'work done' but it is very rarely seen. Candidates should remember that the phrase is very useful in most contexts where energy is transferred and a force is involved.

Question 14(b)

This question involved a short two-step calculation, made more difficult by the use of non-standard units. Most candidates realised that in this situation, converting to SI units was unnecessary. Those who did try to convert units often made a mistake along the way.

Question 14(c)(i)

This was a simple one step 'show that' calculation. Almost all candidates successfully worked this out and remembered to give more significant figures than the 'show that' value.

Question 14(c)(ii)

This question involved an unfamiliar context. It was not a standard calculation and involved a complex combining of data. Many got off to a bad start by using $P=IV$, rather than $P=I^2R$, failing to realise that the potential difference was across not just the cable, but the household appliances connected to it as well. Most candidates went on to gain some processing marks regardless. Of those who got to an answer, most were successful in comparing their numbers to the claim in the question and giving a conclusion.

Question 15(a)

This question was a single-step calculation. Most candidates got the correct value, with a few forgetting to convert to metres. A significant number of candidates rounded their answer to 1 significant figure. This is not acceptable for any answer, unless it is an estimate. A significant number also got confused about the units, giving W for power instead of D.

Question 15(b)

This question was well answered considering it had many stages to the explanation. Some candidates did not involve all the stages, jumping from the first mark point to the fourth or fifth. This meant they could not be awarded many marks, as the final two marks were dependent on the middle marks to link them to the refractive index change. A few candidates ignored the data given on the graph and discussed viscosity changes and how it might affect the intensity of light allowed through the oil. This was not successful. Candidates should be encouraged to look at all information given in a question to help point them to the correct approach.

Question 16(a)

This question tested practical skills. As it was a light practical, many candidates explained how they would measure distances for the similar core practical involving light through a diffraction grating. This question was different with many equally spaced fringes. A few candidates realised that the technique of measuring across many fringes at once should be utilised. This technique should be familiar to them, but most were unable to transfer their knowledge to this context.

Question 16(b)(i)

Most candidates attempted this question and scored some marks. The vast majority plotted the correct graph. Most candidates chose sensible scales, but occasionally awkward scales were chosen for the y axis (remember that 2.5's and 4's are included in these) and therefore could not be awarded either MP3 or MP4. Many candidates are still using brackets around units on graph axes labels instead of quantity/unit. Best fit lines were generally of a high quality with fewer candidates than normal producing bent lines due to using a short rule.

Question 16(b)(ii)

Most candidates chose a large gradient triangle which was good. A significant number of candidates used a data point either from the best fit line or from the results table and substituted the numbers into the given formula. However, this is a risky strategy as it is only appropriate if the best fit line has passed through the origin. If it did, then they could access all the marks provided that the data point was for $1/\omega > 30\ m^{-1}$ (more than half of the range of $1/\omega$). Candidates should be encouraged to give their answer to a suitable number of significant figures and add the unit.

Question 16(c)(i)

This question involved calculating a percentage uncertainty for a set of repeat readings. Most candidates were successful, although should be encouraged to limit the number of significant figures for percentage uncertainties to 2. A significant number of candidates used the first and last reading from the table without checking whether these were the highest and lowest values. A few candidates used the range instead of half of the range.

Question 16(c)(ii)

This question involved using uncertainties to find the limits of certainty for the value of wavelength and therefore make a conclusion about the relevance of the data. Candidates either calculated percentage uncertainties and combined them to calculate the limits or substituted individual maximum and minimum values into the equation to find the limits directly. In this instance, the first method was more successful for candidates.

Where the equation involves a division, many candidates use the incorrect maximum or minimum vales for the individual pieces of data and therefore so not end up with valid limits. Candidates who do this can still gain processing marks. Many forgot about ω having an uncertainty from (c)(i), and therefore did not include it. This mistake was made by candidates using both methods.

Summary

This paper provided candidates with a wide range of contexts from which their knowledge and understanding of the physics could be tested. A sound knowledge of the subject was evident for many, but the responses seen did not always reflect this as the language lacked precision and its ambiguity prevented some marks from being awarded. Based on their performance on this paper, candidates are offered the following advice:

- Note that graph questions will always involve using a gradient for the following calculation.

- Practise questions under timed conditions to ensure that you do not run out of time on the last question.

- For projectile questions, split your answer section in two, with one side for horizontal data and calculations, and the other for vertical. This way you are less likely to muddle up which piece of data to use.

- Complete questions set in unfamiliar contexts to practice applying knowledge rather than simply learning set methods.

- Repeating phrases from the stem of the question in explanations will not gain marks.

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