

Examiners' Report/
Principal Examiner Feedback

Summer 2014

Pearson Edexcel International GCSE
in Physics (4PH0) Paper 2PR

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Publications Code UG039702

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General

Many students scored very well across all aspects of this paper, indicating thorough preparation fully covering the specification. Numerical work was usually handled very well, including simple rearrangement of equations. There was evidence that some centres were better at preparing their students for questions relating to experimental work and other AO3 skills. It was also evident that many students found difficulty in structuring their responses to longer, extended questions. There are strategies that can be used to improve students' performance in these areas.

It was noted that some students wrote in such a heavy pen that there was 'bleed through' to the opposite side which caused difficulties in reading the responses.

Question 1

This question proved to be an accessible start to the paper for most students with over 80% gaining full marks in each part. There were few consistent errors apart from numerical ones in part (c).

Question 2

Most students also found this question on pressure and temperature in gases accessible. Approximately 80% correctly choose harder impact for part (a). In part (b), less than 10% failed to gain a mark. However, many students did not realise that there were two marks available and gave brief incomplete answers for this part.

Despite asking for students to convert a temperature into Kelvin in part (ci), many students used Celsius temperatures in the calculation of pressure and thus less than 40% of candidates gained full marks in part (cii).

Question 3

Apart from (a), the rest of the question was AO3 based and showed some lack of skill in evaluation of experimental method.

In part (a), over 80% of students correctly identified the trace for the loudest sound with the lowest frequency. The graph work in (bi) and (bii) was well attempted by the majority of students with over 70% gaining six or more marks. The usual range of common errors was seen: points as 'blobs', the line of best fit with kinks, the line of best fit not extending beyond the plotted points and awkward or non-linear scales. For part (bii), most students realised that they needed to find the gradient of the best fit line but quite a few choose to use a single data point (often from the table), rather than drawing a suitable triangle and using two data points. Similarly, some students did not match their unit to the value they obtained e.g. 0.33 m/s rather than 0.33 km/s.

The idea of a 'fair test' was well known but ways to improve quality of data were not known as only 30 % of candidates gained a mark in part (biv). Centres are advised to download the teachers support materials from the Edexcel web site for guidance on AO3.

Question 4

It was pleasing to note that the majority of students gained full marks in (ai) for a clear diagram with sufficient detail. A few students lost marks for the usual errors: crossing field lines, gaps at the poles and conflicting field directions. The reason for the iron core was only known by about 25% of students.

The responses to part (b) showed good understanding of the properties of hard magnetic materials, but many students repeated the stem of the question 'remain attached' and hence failed to gain a second mark.

Question 5

This question on the transformer had a variable level of response. In part (a), which was AO1 and AO2 based, students gained high marks. However in part (b), the extended writing explanation of how a transformer works, many students had great difficulty in structuring and sequencing the required causal explanation. Only 1/3rd of students gained three or more marks in (b). Some of this was due to lack of precision but more often great misconceptions were shown e.g. 'the current travels through the core to reach the secondary coil' instead of the magnetic field in the core interacting with the secondary coil.

Question 6

The responses to parts (a) and (b) of this question were pleasing and demonstrated good understanding of electrostatics. There were only a few instances of responses where positive charge moved. Where students failed to gain marks, this was often due to lack of precision in their answers. It was therefore surprising that the vast majority of students (nearly 90%) did not realise that the charge won't move in part (c) because the balloon is made from an insulating material. However, about 25% of students were able to suggest why the experiment does not work well in humid conditions.

Question 7

Nearly half of the students named 'crumple zones' as a safety feature in cars and a further 40 % were able to name another feature often 'air bags'.

The difficulty that students have in structuring extended writing was seen in part (bi). However, about 50% of students were able to identify longer time of impact and reduction of force and hence gained two marks or more. Very few considered the effect of stretching on the seat belt and the consequential reduction in pressure. Slightly fewer students could make a sensible suggestion for the use of a full-body harness. Only 25% of students knew what happened to the momentum of the car in a crash. It was somewhat worrying that some students thought it could be converted into energy.

Question 8

The responses to this question were pleasing and demonstrated that students are able to recall equations and manipulate numerical data. Over 90% of students gained full marks for this question.

Based on the performance shown in this paper, students should:

- Take note of the number of marks given for each question and use this as a guide as to the amount of detail expected in the answer
- Be familiar with the equations listed in the specification and be able to use them confidently
- Recall the units given in the specification and use them appropriately, for instance speed
- Be familiar with the names of standard apparatus used in different branches of physics
- Practice structuring and sequencing longer extended writing questions
- Show all working, so that some credit can still be given for answers that are only partly correct
- Be familiar with the list of suggested practical given in the specification and be able to describe these experiments in reasonable detail
- Be able to identify independent, dependent and control variables and be ready to comment on data and improving experimental methods
- Take care to answer the question asked not a similar question on the same topic from a previous exam paper
- Take advantage of opportunities to draw labelled diagram as well as or instead of written answers.
- Allow time at the end of the examination to check answers carefully and correct basic slips in wording or calculation.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

