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Examiners' Report/ Principal Examiner Feedback

Summer 2012

International GCSE

Physics (4PH0) Paper 2P

Edexcel Level 1/Level 2 Certificate

Physics (KPH0) Paper 2P

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4PH0 & KPH0 (2P) Examiners' Report – Summer 2012

General comments

Once again, most candidates were able to recall the equations and usually they handled the related calculations well. Candidates who gave the best practical descriptions usually appeared to be writing from first-hand experience. Responses to the longer questions showed that the less able candidates often struggle to assemble a logical description or to include more than one basic idea. There was a wide range of response and it was good to see that many candidates were able to give full and accurate answers.

Question 1

These questions were designed to provide a straightforward start to the paper. Most candidates coped well with the astronomy questions and were able to score full marks here.

Question 2

Some candidates did not deduce the number of periods correctly from the trace. A common error was to count the half periods and give the answer as 6. When the candidate's working showed that this error was carried forward into the frequency calculation, it was possible to allow some credit. Many candidates found it hard to calculate the frequency correctly, even if they had not made an initial error. Most of the drawings were worthy of credit, although a common mistake was to draw the new trace with exactly the same frequency as the example given.

Question 3

Many candidates found it difficult to describe a magnetic field line in terms of direction, although they usually went on to label the lines in the diagram correctly. A majority of candidates could give the direction of the force on the wire as perpendicular to both field and current, but many drew their arrow pointing to the left rather than to the right.
Candidates usually found a way to say that the magnetic field in the square was non-uniform, but few went on to qualify their comment, for instance, by pointing out that the field decreased as distance from the wire increased.

Question 4

Most candidates could identify the anomalous reading and calculate an average. Far fewer were able to give a perfect response that both ignored the anomalous reading and gave the final value to an appropriate number of significant figures.
Many candidates made an appropriate comment on the student's statement, although very few came up with more than one idea. The most common creditworthy response was that there may be variation in coin thickness.
Some candidates did not notice that the volume was already known and gave detailed accounts of methods for calculating or measuring volume. Most realised that a value for mass would be needed and many gave enough detail in their

descriptions for full marks. This extra detail usually included the equation for finding density.

Question 5

Most candidates could draw the path of the ray correctly, but fewer were able to identify the angles of incidence and refraction accurately. Although the calculation of the refractive index was generally done well, some candidates offered an inappropriately large number of significant figures for the sine values. Even so, most gave the refractive index acceptably to 1 or 2 decimal places. Some candidates remembered the form of the Snell's law equation correctly, but omitted to mention sine and simply gave a ratio of angles.
The candidates who gave the best accounts of the investigation appeared to be writing from experience, and included useful experimental details. Weaker responses usually included the idea of repeating measurements, but did not suggest collecting readings for a range of angles. Some candidates suggested extending the investigation to include a range of materials or colours, rather than concentrating on improving the accuracy.

Question 6

The Ohm's law calculation was generally done very well. Most candidates realised that an instruction to "show that the current is about 10 A" requires them to calculate a value to an appropriate number of significant figures to demonstrate this. Most had clearly been encouraged to show their working and those who included 10.5 (or 10.45) at an appropriate point in their response were rewarded.
The idea that a fuse operates when there is excessive current appeared to be well understood, but few responses also included the idea that a fuse is a safety device or that it prevents fires. Most candidates realised that the current would exceed 2 A, but few related this to the 10 A heater current that they had calculated in the first part of the question.

Question 7

Most calculations of the work done were correct. Even if they did make a calculating error, many candidates were still able to get some credit for realising that the energy transferred was the same as the work done.
The idea that a stationary carton would no longer have kinetic energy seemed to escape many candidates. Responses that gave an appropriate description of the fate of the kinetic energy were accepted. Many candidates were able to explain why the gravitational potential of the carton was reduced, but few mentioned the idea of centre of gravity

Question 8

The weaker responses were often limited to a single relevant idea, for instance that beta particles are more penetrating or that alpha particles are more massive. In many cases candidates filled the available space simply by repeating ideas, or by giving a single idea together with its converse e.g. "alpha particles are larger and beta particles are smaller." Even the weakest responses showed

that candidates had learned well, there were very few incorrect statements. Better responses usually came from candidates who compared the ionisation effects and there were many thorough and accurate answers worthy of full marks. The best responses were usually characterised by logical sequencing of the ideas presented, for instance “alpha particles have a larger charge so they can cause more ionisation and this means that they lose their energy more quickly.”

Question 9

Most candidates could calculate the momentum of the cloth, but the weaker candidates were confused as to the appropriate unit. Many wrong units included an extra oblique, e.g. kg/m/s or kg/ms^{-1}. The conservation of momentum calculation proved more demanding and the common mistakes were omitting to add the masses or incorrect transformation of the equation. Where possible, marks were given for correct partial working.
Nearly all candidates rightly concluded that the student’s statement was incorrect but many found it difficult to find the words to justify this conclusion. A formal statement about controlling variables was not expected and many candidates received credit simply for pointing out that the two cloths would have different masses. More thoughtful responses mentioned that “throwing the cloth the same way” does not necessarily guarantee an identical velocity.

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