Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

November 2020

Pearson Edexcel International GCSE
In Physics (4SS0) Paper 1P

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General comments

The paper consists of 60 marks assessed by a mixture of different question styles, including multiple-choice questions, cloze and short open response questions, calculations. All questions should be answered in the allowed time of 1 hour 10 minutes. The paper aimed to give candidates of all abilities the opportunity to demonstrate their knowledge and understanding. Candidates seemed to be well prepared on the whole, and most could attempt all of the questions which was evidence of the overall accessibility of the paper. There seemed to be no evidence of candidates being short of time. The paper produced a very wide spread of marks indicating that the paper successfully discriminated between students of varying abilities.

Question 1

This question provided an accessible start to the examination with most students able to gain 3 or 4 marks. Part (c) was less well known.

Question 2

(a) Students generated some good clear answers, with the best illustrating their answer with a labelled diagram. In general, if a diagram was drawn, the angle of refraction at 90 degrees was chosen. Weaker answers failed to link the critical angle with the angle of incidence or if a diagram was drawn to show the angle of incidence clearly or drew it incorrectly.
The weakest answers included poor descriptions, confusing reflection and refraction and considering mirrors rather than refracting materials.

(b) Generally, this was a well answered question with many carefully drawn and correct diagrams scoring full marks. In some cases, there was some poorer drawing, that made it difficult to judge if the emergent ray was intended to be parallel with the incident ray. It was evident that a small number of students had little experience of the diagram and drew rather random rays of light in the proximity of the prisms.

Question 3

(a) This question generally was able to yield some marks for all students. The most commonly awarded mark was for mentioning that time was to be measured. A good number also scored a mark for suggesting that the time is recorded at each marking. Students were often able to suggest a suitable graph to draw but most were then unable to explain how to obtain a value for acceleration from their graph. Having said that, there were a number of excellent full mark answers that were well structured and logical.
Weaker students simply described the equipment and made comments such as ‘use the stopwatch to measure the acceleration’ of insisted that the height of the slope should be involved in some way. There was an indication that response quality was centre dependent, clearly some students had been well schooled in answering such questions. Others were left floundering in generalisations about the diagram.

(b) This question was often quite poorly answered. Where correct answers were seen they tended to relate to reaction time. The other possibilities were seen rather less. The term

'human error' was seen in big numbers and such generalised comments did indicate that students had not really considered the context of the question.

Question 4

(a)(i) Most students were able to provide the correct equation. Some students incorrectly used the symbol "c" to represent current. This is not creditworthy as it is too easily confused with charge. Where students are uncertain of the correct symbol to represent a quantity they would be best advised to use the words given in the question.

(a)(ii) Many good responses were seen which were awarded full marks. Some students were unable to correctly rearrange the equation and some apparently evaluated incorrectly giving the incorrect answer of 0.84A rather than 0.084A

(b)(i) Most students were familiar with the correct symbol for a voltmeter, but a significant number placed it in series rather than parallel.

(b)(ii) Students tended to score either full marks or zero on this question.

Question 5

(a)(i) Usually answered correctly

(a)(ii) A significant number of students answered this question by saying that the nucleus becomes unstable. This could not be credited as the question asks about fission. Those who focussed on fission were able to state that the nucleus splits or divides. Some very good answers went on to describe fission in more detail often naming the fission products, though this was not needed for this question.

(a)(iii) Generally answered correctly, the most common incorrect response was to state nuclear.

(b) Most students scored either one or two marks on this question. Most recognised that gamma radiation presents a hazard, and that gamma is very penetrating. Not many students explained that the shielding will absorb the gamma radiation. Answers were generally well organised and addressed the question and showed a good knowledge of hazard and penetration ability. Some students got the wrong end of the stick and considered the concrete shield as a means of keeping out extraneous radiation just in case it upset the fission process. This was rare, most students seemed to understand what was expected of them.

Question 6

(a) The mathematical skills of many students were good, and this question gave a good number of correct answers. In a few cases the final answer was given as 512 where students forgot to take the square root to obtain the final answer, but most were able to work through to the end. In some cases, poor algebra meant that rearrangements were incorrect. It was a pity to see that some students, clearly in a hurry, mis-transferred data into the equations particularly where standard form was being used. Weaker students were poorly practiced in substitution and rearrangement.

(b)(i)-(ii) Many students scored at least a mark if not two. The recall of the equation was quite frequently seen, as was the substitution. For some reason students then added some extra bits to arrive at the wrong answer, losing a mark. The most common error was missing out 'g' from the equation. In part (ii) correct answers were more rarely seen. There were more bank spaces for this part than in other questions. Many students seemed to be compelled to undertake a calculation in this part, which was generally wrong. Students appeared to ignore the low mark tariff on this item. A good deal of valuable time was probably lost in pointless calculations.

(b)(iii) Some students tried to answer this by naming the starting and end energy stores of this process rather than by naming the method of energy transfer. This type of incorrect response may be centre dependant depending on how students have been taught energy transfer.

Question 7

(a) Many students were able to gain full marks on this question, though some were clearly unfamiliar with the left-hand (motor effect) rule and failed to score.

(b) This was a very well answered question. Many good diagrams were seen, drawn with a ruler and with care. The result was a good number of full mark answers. Where marks were lost it was generally as a result of getting the arrows the wrong way round, or sloppy drawing. Nearly all students appeared to understand what they had to draw.

(c) (i) The ability to clearly express themselves gave a problem for some students in this question. It was evident that some students were trying to describe ac but vocabulary was not good. It was evident that this had been taught well in some centres, with good clear answers. Generally, students scored the dc mark more easily. The issues came in describing ac where the essential point that direction frequently changes was not well described. Those students that included a diagram, generally scored both marks.

(c)(ii) Less than half of the responses seen were correct. Incorrect answers often stating that the cone would rotate or vibrate.

(c)(iii) Similar to 7ci, language issues were a problem for some, in trying to express the lack of vibration generated by dc. The idea of the current a battery produces was better understood, and a fair few scored a mark. The problem was relating that to the way the cone would behave. Weaker students thought that the battery was some part of the actual speaker or thought it would obstruct the physical movement of the speaker. Many incorrect answers focussed on the incorrect assumption that dc could not provide enough energy.

Question 8

(a) Overall, this question scored well. In most cases students could work out the correct temperature and plot it correctly. The y axis scale gave some students problems, and a few plotted the point too low. Where students got 8(a)(i) wrong, they were in most cases able to plot their point on the graph and gained a mark for doing so. Graph plotting skills were found to be very accurate for most students. It was unusual to find a point wrongly plotted. The final

mark was the most challenging. Many were unable to draw a line of best fit, instead joining the points dot to dot. Where the line was drawn as a straight line, many of those were able to get an accurate line and score this last mark.

(b) Many students included a unit as part of their answer which is not needed for a simple ratio.

(c) Most recognised that the gas molecules collide with the walls but less scoring the second mark for explaining that this creates a force. Very few answers gained the third mark gained for making the link to the pressure equation. Overall though the concept seems to be quite well understood.

(d) It was evident that some students had not read the stem of the question and understood that temperature was constant. Those that did read carefully, scored well, with most recognising that the pressure increases. Some students did not go on to explain the effect that this would have on the graph. In a few cases students gave a molecular explanation rather than a macroscopic explanation and wasted some time.

Summary Section

The following are a few general comments based on the performance of students on this paper.

- Students should be given as much practical experience as possible, such as in setting up electrical circuits and using a range of measuring apparatus.

- Students need to ensure they read the question carefully as some were giving answers that were already given in the question and so did not gain credit. They should also be encouraged to avoid vague generic answers. Instead they need to give more detail and qualify their answers, such as in describing the pattern or trend shown in a graph.

- Students should be given practice so that they are confident at rearranging a given mathematical equation.

- Students should ensure to answer the question applying their knowledge to the context provided.

- Answers need to be written so that the meaning is clear, eg “the temperature of the water increases”, rather than “it increases”.

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