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Examiners' Report/ Principal Examiner Feedback

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Examiner's Report International GCSE Physics 4PH0 2PR

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, excluding 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.

Question 1

This question was proved to be not as accessible as expected, as over 30% of students failed to gain a mark in part(a). There were some detailed sketch graphs and over 55% gained both marks. The advantages of digital signals were also quite well known although some students described the differences between digital and analogue which did not gain credit.

Question 2

It was pleasing that nearly 90 % of candidates were successful in part (a). Students were also successful in parts (bi), (bii) and (biii) with over 70 % gaining eight or nine marks. Common errors included: poor scales in multiples of three, nonlinear scales, incorrect rearrangement of the equation and inevitably the incorrect unit.

However, the rest of the question showed a distinct misunderstanding of what the question asked. This could be due to common practice where the description of the pattern shown by the graph is mixed with the conclusions that can be drawn from the pattern. Nearly 50% of students gained 2 or more marks in (biv) by describing where the graph was linear and where it was not. Frequently students then continued by writing the conclusion *also* in part (biv). As a consequence, many students did not know what to write in part(bv). Students also omitted any mention of 'resistance' in the last part. Nearly two thirds failed to gain a mark in part (bv).

Question 3

This application based question was shown to be accessible to most students, with almost two thirds gaining full marks in all parts. The only sections that caused any difficulty were (bii) and (biii). It is unfortunate, but inevitable, that students who cannot recall the equation correctly, also lose the marks for the calculation. Some students were unable to rearrange the equation.

Question 4

It was very surprising that over a third of students could not name a suitable nuclear fuel: petrol and coal were common responses! This, presumably, was because students had not read the stem of the question. Part (aii) was quite disappointing as over 40% of students gained no marks for an explanation of fission products. Similarly, part (aiii) was also poorly attempted with a similar success rate.

In part (aiv) the function of a moderator was quite well known. Many students seemed not to have read the question in (av) as they wrote (at length) about what control rods did, but not about what would have without control rods: hence they limited their marks.

The conversion to kelvin was usually correct in part (bi). It was quite common to see students attempting to use p.v= constant in part (bii) even though the equation was given on page 2. Inevitably, many students could not rearrange the equation and some did not use the kelvin temperature. However, over 50% of students gained full marks.

Question 5

Most students made very good attempts in part (a) with over 50% gaining 4 or 5 marks. There were a few students who (again) could not rearrange the equation but the most common error was to not add the mass of the skateboard to the boy's mass. The explanation in part (b) was also well attempted with many very detailed explanations seen. Just under 25% of students failed to gain a mark.

Question 6

The data analysis question proved to be a good discriminator across all the grades. It was pleasing that over a third of students gained full marks. The most common error seen was that students merely quoted the data from the table without commenting on the data or its relevance in some way e.g. 'the gas turbine starts up in 15 minute' without adding 'which is the fastest of the power stations'. Repeating the data without using it failed to gain credit.

Question 7

This was an application question based on the principle of moments. Parts (ai) and (aii) were designed to be a straightforward introduction into how the gate worked. However, only25% gained the mark for part (ai) with a further 35% gaining the mark in (aii). Possibly this was because of lack of precision e.g. saying 'the lever moves the bolt' instead of 'the lever arm moves the bolt to the left'.
The calculation in part (bii) was much better done with over 40% gained all the marks and a further 25% of students gained 2 marks. In part (biii), it was pleasing to see that some students decided to use a mathematical explanation by giving a larger value for the distance to point A. Many students failed to gain full marks because of lack of precision in their answer by for example not qualifying which distances they were referring to. Just over 40% failed to gain any mark for part(biii).

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
- Practice structuring and sequencing longer extended writing questions
- Read the introduction (stem) of each question in order to get the correct context
- Practice using data given in the question in a meaningful way by for example making a comparison or using it further into the question
- Show all working, so that some credit can still be given for answers that are only partly correct
- Be able to comment on data and experimental methods
- Take care to answer the question asked not a similar question on the same topic from a previous exam paper
- Be able to rearrange equations
- Allow time at the end of the examination to check answers carefully and correct basic slips in wording or calculation

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