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Physics B: Physics in Context PHYB2

(Specification 2455)

Unit 2: Physics keeps us going

Report on the Examination

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GCE Physics, Specification B: Physics in Context, PHYB2, Physics keeps us going

General Comments

The paper was generally accessible to the candidates. All parts of questions attracted high quality answers from some candidates. However, there was some indication that some candidates were not familiar with the contents of question 9. In addition, question 10 (b) attracted answers that tended to cover only some of the significant areas. In this question, it seemed that candidates may have been happy to answer a direct question about the greenhouse effect but linking it with another idea showed up the limitations of some candidates' understanding.

There did not seem to be any issues with timing. Although there were some questions that were not attempted, this seemed to be because of a lack of knowledge and understanding rather than a lack of time.

Once again, the organisation of mathematical work was variable and it was again notable that those candidates that adopted a systematic and careful approach to the setting out of calculations were much more successful that those who were haphazard and untidy.

Question 1

Part (a) was correctly done by most candidates. In part (b), a large number of candidates could make no progress towards a correct parallelogram or triangle of forces.

Question 2

Although many candidates referred to the independence of the horizontal and vertical components, only around half mentioned that there was a constant horizontal component and vertical acceleration caused by gravity. Almost all candidates that attempted part (b) correctly did so. It seems likely that those who did not attempt it had not noticed the question.

Question 3

Most candidates identified the radiation correctly in (a) but only a minority could correctly specify the wavelength in (b). The majority made an acceptable comment about the risk in (c).

Question 4

Around half of the candidates were completely successful with the calculation in (a), but the others tended to miss one of the factors such as the density or *g*. Part (b) was found to be more difficult. A direct comparison of the upthrust and the weight of the diver was rarely given, even though both of them were effectively given in the question.

Question 5

This question was correctly done by more than half of the candidates. Those that went wrong tried to find an average efficiency rather than an overall efficiency.

Question 6

Most candidates managed a partial explanation of the energy transformation involved in electrical heating. The most common error was not making reference to the kinetic energy of the electrons.

Question 7

Most candidates correctly answered the calculation in (a), with the most common error being the introduction of a spurious factor of *g*. Nearly all candidates successfully completed the graph work in part (b).

Question 8

Many candidates managed a partial explanation of this standard phenomenon in part (a).
Most recognised the importance of the increased numbers of charge carriers. Acceptable comments about how electrons are liberated or about the increased lattice vibrations were rare. The calculations in parts (b) (i) and (b) (ii) tended to be done well. Data was correctly extracted and well processed. Some candidates got the potential divider voltages the wrong way round.

Question 9

Around half of the candidates did well with this question, but many of the rest seemed to be unfamiliar with U-values. The most common error was to try to find an average value of U-value instead of summing the energy losses through each section. Although the second part invited candidates to use the data from the table to make a comparison, only a minority did. Those that performed a numerical comparison tended to gain full marks.

Question 10

A small but significant number of candidates did not attempt both parts (a) and (b). In part (a), many candidates did not recognise the need to find the peak wavelength from the value of frequency that had been given. Of those that did, some made a transposition error when using the wave equation. Good answers to (b) were rare. Many candidates gave superficial descriptions of the greenhouse effect and some named the gases responsible. Discussion of the relevance of Wein's Law were rare. Candidates should have been comparing the wavelengths emitted by the hot Sun with the wavelengths emitted by the cooler Earth and its atmosphere. Confusion with other aspects of atmospheric pollution were quite common.

Question 11

In part (a) (i), most candidates realised that they had to divide a change of speed by the time taken for the change, but a large number did not convert to appropriate units. Part (a) (ii) was done well by most candidates. Part (b) was also answered well, with nearly all candidates making at least two appropriate comments.

Question 12

In part (a), most candidates knew the correct equation but had not realised that they should use a simplified form of it, having already been given the area of the blades. Candidates tended to make progress towards a correct calculation in part (b) (i) but many missed out one or other important terms from their calculation, for example, the density of the water. A large number did not attempt the simple power calculation in part (b) (ii), but around half correctly answered it. Answers to the final part tended to be superficial with little careful thought. For example, many commented that there were no suitable sites, which, being untrue, is not the equivalent of making a sensible comment about the limitations of suitable sites.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results statistics page of the AQA Website.