



General Certificate of Secondary Education

**Additional Science 4463 /
Physics 4451**

PHY2H Unit Physics 2

Report on the Examination

2008 examination - June series

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Physics

Higher Tier PHY2H

General

Most candidates attempted each part of each question.

In calculations it is important that candidates show their working clearly.

When an arithmetic error is made candidates can gain credit for a correct method. Candidates should also know that numerical answers are usually realistic figures and therefore should appreciate whether their answer is realistic or not.

Question 1 (*Standard Demand*)

- (a)(i) The majority of candidates gave the correct answer, although a common error was the response of 72 V (8×9).
- (a)(ii) This was poorly answered with many candidates giving an answer of 4 V.
- (b)(i) This was answered correctly by less than half of the candidates. Many answers were given as a description, such as, heat sensitive resistor. There were many guesses. These included 'metal', 'wire', 'kettle' and 'bulb'.
- (b)(ii) The vast majority of candidates clearly understood the term 'range'.

Question 2 (*Standard Demand*)

- (a)(i) The majority of candidates scored both marks. The most common error was the inclusion of electrons.
- (a)(ii) About 50 % of candidates gained this mark. The most common incorrect response was 111.
- (a)(iii) There were few correct answers to this question. Many candidates lost the mark by giving vague answers, such as, 'two protons and neutrons'.
- (b)(i) Less than half the candidates were able to correctly calculate an answer. Many candidates scored one mark for correctly totalling but then appeared to have no idea how to calculate the proportion.
- (b)(ii) Over 50 % of the candidates chose a source from the pie chart, rather than choosing a source that was not natural.
- (c)(i) This was answered well. However, a significant number of candidates gave the answer as '1.8' ie 'how much bigger' rather than 'how many times bigger'.
- (c)(ii) Few candidates scored both marks. More candidates scored a mark for recognising the background radiation was lower than the level that was likely to cause ill health, than mentioned the 2-week period. There were many misconceptions such as the idea that because the people were not used to the higher level that this would have a greater effect on them. Many candidates suggested that radiation sickness is a disease that can be caught or avoided.

Question 3 (Standard Demand)

- (a)(i) Most candidates gained a mark in correctly stating that the thinking distance is directly proportional to the speed.
- (a)(ii) Most candidates drew a correct line, although some drew the line parallel to the given line and above rather than going through the origin.
- (a)(iii) Answers to this question were varied. A number of candidates did not seem to know what the Highway Code was. Many of those who knew its origin and purpose thought that the numbers would have been exaggerated to encourage drivers to keep greater distances between cars.
- (b)(i) This question was poorly answered with less than half the candidates gaining credit.
- (b)(ii) Many candidates did not read the question carefully and gave factors that would affect reaction time or gave speed as a factor.

Question 4 (High Demand)

This question was the most poorly attempted with a number of candidates scoring zero.

- (a) Some candidates scored one mark for using the word 'alternating'. Very few candidates were able to score both marks.
- (b) A small number of candidates gained a mark.
- (c)(i) This was not well done, and there was little indication on the scripts to show how candidates had attempted it.
- (c)(ii) Few candidates obtained the correct answer. A number knew the correct method and gained credit by using their incorrect answer to (c)(i) appropriately.

Question 5 (High Demand)

- (a) This was well done by candidates, a significant number gaining full marks. However, many candidates were not confident of the unit. If the calculation was incorrect the unit mark was rarely scored.
- (b) The majority of candidates scored this mark. The most common incorrect answer being 6 seconds.

Question 6 (High Demand)

- (a)(i) Many candidates answered this well, recognising the benefit of the glue spreading out.
- (a)(ii) This was quite well done although a number of candidates did not realise the sand would become charged and thought that the glue would attract the charged plate and the sand would stick because it was in the way.
- (b) Some candidates were able to complete this calculation and give a correct unit. Others who could transform the equation went on to complete an incorrect substitution. The units were not known to the majority of candidates, with most either omitting them or giving volts.

Question 7 (High Demand)

- (a) This calculation was not often correct. Many candidates were unable to use the correct pieces of data appropriately. There was widespread confusion between mass and force, and even time and velocity were interchanged in many equations. However, some candidates did complete the calculation well.

- (b)** Many candidates recognised that there was more air pushed down per unit time or that the air was moving faster. Some candidates confused the air moving faster with the toy moving faster. Although many candidates scored one mark, few candidates were able to link the increased air movement to the subsequent acceleration in order to score both marks.
- (c)** This was poorly done with most candidates not considering momentum but trying to use their knowledge of polystyrene to answer the question. Many responses centred on the air content of the polystyrene or the air resistance slowing it down on its descent.

Mark ranges and award of grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA website.