



General Certificate of Secondary Education

Physics 4451

PHY3F Unit Physics 3

Report on the Examination

2011 Examination – June series

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Physics
Foundation Tier PHY3F**General**

Questions 1 to 6 were low demand targeting grades E, F and G. Questions 7 and 8 were standard demand targeting grades C and D.

The majority of candidates attempted all parts of all questions, with few parts left unattempted. It was disappointing how many candidates had failed to take a calculator into the examination and therefore had difficulty with 8(b) and some did not appear to have a ruler either. In both calculations a few candidates obtained the correct answer but then transcribed it incorrectly into the answer box and consequently lost a mark.

Candidates continue to find it difficult to express a relationship between two variables in terms of increasing and decreasing, rather than 'the bigger one is, the smaller the other is', or whatever is appropriate. A significant number of candidates also use the terms directly proportional and inversely proportional incorrectly.

Question 1 (Low Demand)

A third of candidates obtained full marks on this question. Most of the other candidates gave the answer 'white dwarf' instead of 'black hole' having failed to notice that the question referred to 'a very large star'.

Question 2 (Low Demand)

- (a) This was a well answered question, with four fifths of candidates giving the correct answer.
- (b) Most candidates did not read the paragraph carefully enough. Less than a third of candidates gained all three marks although nearly a third of candidates inserted two of the three words correctly.
- (c) (i) These part questions were answered well with nearly all of candidates managing to mark the centre of mass correctly. However part (c)(i) was marred by
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(c) (ii) candidates drawing a plethora of lines some of which were incorrect and some of which may have been construction lines but were not identified as such and therefore a mark could not be awarded.

Question 3 (Low Demand)

- (a) This was well answered with over half of candidates gaining both marks and under a tenth of candidates not achieving any.
- (b) Many of the quarter of candidates who did not gain this mark either gave a vague answer such as 'scans' or wrote an incorrect answer such as 'X-rays'.
- (c) (i) Surprisingly, just over a quarter of candidates were unable to count the number of waves and give the correct answer.
- (c) (ii) Over four fifths of candidates were able to identify the pattern showing the most waves as being the one showing the highest frequency.

Question 4 (Low Demand)

- (a) Four fifths of candidates knew the time period of a geostationary orbit.
- (b) Over two thirds of candidates identified the correct answer.
- (c) Many candidates frequently described, incorrectly, a use of the satellites rather than an advantage with over three quarters of candidates not gaining any mark and very few candidates did not give an answer at all.
- (d) Again very few candidates did not answer this part question. Less than half of candidates gained the mark by giving some form of communication. The most popular incorrect answers were some form of weather forecasting or monitoring.

Question 5 (Low Demand)

- (a) (i) Although over half of candidates knew that the experiment worked because copper is an electrical conductor, just under half of candidates thought it was because copper is a magnetic material.
- (a) (ii) Nearly three quarters of candidates were able to describe an acceptable way to increase the speed of the copper roller. However in this question and the next many candidates suggested tilting the rails to achieve the desired effect.
- (a) (iii) Candidates lost marks in this question by not explaining clearly enough what they meant, for example several mentioned moving the battery to the other side without mentioning reversing the current or the connections and there were many incorrect answers relating to the switch. However, more than two fifths of candidates gained at least one mark. The most common correct answer related to reversing the magnetic field in some way.
- (b) (i) This was well answered with nearly all candidates gaining the mark.
- (b) (ii) This was well answered with nearly two thirds of candidates giving the correct type of issue.

Question 6 (Low Demand)

- (a) (i) Nearly half of candidates correctly identified the mirror/reflector. A few candidates lost the mark by describing it as convex but the most common mistake was to call it a lens.
- (a) (ii) Just over half of candidates could correctly name the process as refraction. The most common error was to call it reflection. There were very few alternatives.
- (b) (i) Two thirds of candidates knew that the diagram showed a converging lens.
- (b) (ii) Nearly three quarters of candidates obtained both marks for the calculation. However, it was disappointing to see how many candidates gave a unit, usually cm, for the magnification. Very few candidates made no attempt to answer this part question.

Question 7 (Standard Demand)

- (a) This was well answered with nearly all candidates giving the correct answer.
- (b) (i) Only a quarter of candidates correctly showed the amplitude. Over a third of candidates made no mark on the diagram at all.
- (b) (ii) Under half of candidates knew that increasing amplitude increased volume/loudness. Most of the incorrect answers suggested frequency or pitch would change.
- (c) Over four fifths of candidates were able to obtain the correct answer from the graph.
- (d) Pleasingly, over three quarters of candidates were able to write a correct conclusion based on the graph. Many of those who did not do so either described how they got their answer to part (c) or just stated the co-ordinates of a point on the graph.
- (e) It was disappointing that only two fifths of candidates could give correctly both ends of the range of frequency for human hearing. More than a third of candidates gave totally incorrect values despite this being the third consecutive paper where it has been required.

Question 8 (Standard Demand)

- (a) (i) Candidates continue to be confused between moments and momentum. Under a quarter of candidates gave an acceptable meaning of the word 'moment'. Very few candidates did not attempt to give an answer.
- (a) (ii) Just over three quarters of candidates correctly gave the purpose of the G-clamp.
- (a) (iii) More than half of candidates described fully the relationship between X and Y as detailed in the table. Over a third of candidates gave a more general relationship which scored one mark.
- (a) (iv) Just over three quarters of candidates knew the reason for ignoring the weight of the ruler.
- (b) Just over a quarter of candidates obtained full marks for the calculation and were able to give the correct unit. Nearly two thirds of candidates obtained two out of the three marks. It was evident that quite a lot of candidates were unable to do the calculation because they did not have a calculator. Some candidates tried to work it out long hand with varying success.

Mark Ranges and Award of Grades

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

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