



**General Certificate of Secondary
Education**

Physics 4451

PHY3F Unit Physics 3

Report on the Examination

2012 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.

A high proportion of students did not attempt either part of question 8, possibly because they failed to turn over the page. However more students attempted part (b) than part (a). There are still a number of students whose writing is very small or otherwise barely legible and some which were very faint.

Students were better able this year to express a relationship between two variables as shown on a graph.

Throughout the paper students lost marks by not reading the question sufficiently carefully and therefore not knowing what was being asked.

Question 1 (Low Demand)

This was disappointing in that less than one tenth of students scored full marks. Significantly more students recognised diagram E than B as being correct and surprisingly very few students realised diagram A was correct.

Question 2 (Low Demand)

- (a) It was pleasing that about three quarters of students recognised the mirror as concave.
- (b) Most students scored both marks for the calculation.
- (c) Despite the fact that there was a very clearly marked and labelled diagram only a third of students were able to pick out the two words describing the image.
- (d) This part was very badly answered with a few students leaving it blank. The majority of students incorrectly gave mirrors in shops or at road bends or magnifying glasses as their example of a concave mirror being used for magnification.

Question 3 (Low Demand)

- (a) (i) This question was well answered with most students scoring the mark.
- (a) (ii) This question was not well answered with a few students giving an acceptable response. Some students lost the mark by using the term 'coil' instead of 'turns' and others did not stipulate which coil was being adjusted. However many students ignored the stem of the question and suggested changing the power supply or the lamp.
- (b) (i) Most students were able to identify the step-up transformer.
- (b) (ii) Over three quarters of students scored this mark.

Question 4 (Low Demand)

- (a) Most students completed the calculation correctly to score both marks.
- (b) (i) Less than a quarter of students correctly answered this question and it became obvious from part (b)(ii) that often their reasoning was incorrect.
- (b) (ii) Many students did not consider moments in this question but merely considered the lifting force and the weight of the pole. Other students thought that the person was only lifting part of the weight. A few students left this question blank.
- (c) Most students gave an answer in terms of changing the length of the pole or varying the distance of the lifting force from the pivot rather than simply increasing the force.

Question 5 (Low Demand)

- (a) (i) Just over three fifths of students realised that frequency is related to pitch.
- (a) (ii) Only a third of the students knew that waveform describes the quality of the sound.
- (b) The answers to this question were disappointing given that it has appeared several times in recent papers. Less than half of students scored both marks although a further two fifths of students did score one mark for the idea of the sound being quieter or not being able to hear the sound.
- (c) (i) Although the students seemed to have had some difficulty in really understanding the information shown in the graphs, just under three quarters of students did score at least one mark.
- (c) (ii) Just over half of students scored at least one mark.
- (d) This was well answered with the majority of students scoring the mark.

Question 6 (Low Demand)

- (a) This was well answered with most students scoring 2 or 3 marks. The most common mistake was to use 'produced' instead 'induced' for the current.
- (b) (i) Almost all students chose the correct response.
- (b) (ii) Less than a third of students could give an acceptable reason for their answer to part (b)(i). Many students incorrectly wrote that the magnetic field increased or grew stronger while other students wrote about the coil turning but made no reference to the magnet or the magnetic field.

Question 7 (Standard Demand)

- (a) (i) A third of students knew the direction of the centripetal force.
- (a) (ii) Nearly half of students were able to give the provider of the centripetal force.

- (b) (i) Very few students were able to give a complete answer as to why the radius of the circle and mass of the rubber bung were kept constant. However nearly one fifth of students did score 1 mark.
- (b) (ii) Disappointingly only a third of students could identify the two words to describe the chosen variable.
- (b) (iii) Almost a half of students could explain why 10 rotations were timed rather than 1. However some students had clearly not read the question carefully and seemed to think that 10 separate timings had been made.
- (c) This question was well done with most students giving the correct relationship between the two variables. It was good to notice that very few used the word 'proportional' this year.
- (d) (i) Over four fifths of students realised that the centripetal force was provided by the gravitational pull of the earth.
- (d) (ii) Fewer than one fifth of students realised that the satellite described was not geostationary and gave an acceptable reason.

Question 8 (Standard Demand)

- (a) For a question testing recall of a standard experiment given in the specification, the responses produced were very disappointing. A few students gave a sufficient explanation to score three marks. Just over a tenth of students did not attempt it at all and a further two fifths of students did not score any marks. Most students did not describe the correct experiment and of those who tried to do so the descriptions were often superficial and inadequate. There was some confusion as to what is meant by a plumb line and a number of students do not know the difference between vertical and horizontal. Some students scored marks by drawing a good, labelled diagram.
- (b) This question was not attempted by a few students and a further half of students did not score any marks. Many students incorrectly suggested repeating the experiment with another piece of card or comparing their results with other groups.

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