



**General Certificate of Secondary Education**

**Physics 4451**

**PHY3F Unit Physics 3**

**Report on the Examination**

*2008 examination - June series*

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# Physics

## Foundation Tier PHY3F

### General

The overall impression of the paper was that it gave candidates opportunities to show what they knew and understood.

One continuing issue is that candidates do not always answer the question asked. Candidates also make it difficult for the examiner if they do not write legibly in black ink.

Questions 6 and 7 were identical to questions 1 and 2 of the Higher Tier paper.

### Question 1 (*Low Demand*)

- (a) Just less than half of the candidates gained the mark. Those that did not often failed to place the X inside the lampshade. A favoured incorrect position was at the junction of the lampshade and the cable.
- (b) The majority of candidates identified that the centre of mass is directly below the point of suspension.
- (c) A third of candidates gained all 3 marks by identifying the correct sequence for the experiment.

### Question 2 (*Low Demand*)

- (a) A third of candidates gained the mark by recognising the correct transformer.
- (b) A third of candidates knew that a.c. stands for alternating current.
- (c)(i) Most candidates recognised that when a current flows in a coil, the coil becomes a magnet.
- (c)(ii) Two thirds of candidates gained both marks by recognising that the coil attracts the iron bolt which moves upwards.

### Question 3 (*Low Demand*)

- (a)(i) Most candidates identified the diagrams which showed traces with the same amplitude.
- (a)(ii) Two thirds of candidates identified the two diagrams showing traces with the same frequency.
- (b)(i) Just over half of the candidates chose the correct range that a human child can hear.
- (b)(ii) Just over half of the candidates gained a mark but those that did not often failed to mention that the frequency of the whistle was above 20 000 Hz. It was not sufficient to state that dogs can hear higher frequencies than humans.
- (c)(i) Approximately a third of candidates gained both marks whilst three quarters of candidates gained at least one mark.
- (c)(ii) Nearly two thirds of candidates identified that the information is collected by the ultrasound detector and gained a mark.

**Question 4 (Low Demand)**

- (a) The majority of candidates gained at least 1 mark.
- (b) Just under a third of candidates knew that stars are able to give out energy for millions of years by atoms joining together.
- (c) Three quarters of candidates correctly identified 'The Milky Way'.
- (d) Just over a third of candidates selected the correct reason.

**Question 5 (Low Demand)**

- (a)(i) Slightly fewer than half the candidates could identify **P** as the direction of the centripetal force.
- (a)(ii) Very few candidates realised that the centripetal force was provided by the girl's grip.
- (a)(iii) Three quarters of candidates identified that if the speed of the roundabout increases that the centripetal force increases.
- (b)(i) This question was well answered with more than 80 % of candidates gaining the 2 marks available.
- (b)(ii) Two thirds of candidates were able to identify the direction in which the father moves correctly.
- (c)(i) Over 80 % of candidates gave the correct answer and therefore gained a mark.
- (c)(ii) Very few candidates could identify the friction between the tyres and the road as the source of centripetal force.

**Question 6 (Low Demand)**

- (a)(i) A third of candidates identified the angle of refraction correctly.
- (a)(ii) A quarter of candidates could name the dash line as the normal.
- (b) A small minority of candidates answered in terms of a digital camera. Only a few of the candidates identified any kind of light detecting device eg film.
- (c) (i) About half of candidates recognised that this is a converging or convex lens.
- (c) (ii) The diagram had been reduced to fit the page but, regrettably, the dimension 1.4cm had not been altered. However no candidate was disadvantaged. This question was answered well with 50 % of candidates gaining at least 1 mark. Numerically correct answers obtained by measuring or by counting or by using the dimension in some appropriate combination were awarded both marks. Where, for example, a correct method and calculation had been employed but a small mistake had been made, eg the object had been miscounted as 21 small squares rather than 20, then one mark was scored.
- (d) Very few candidates related the formation of a real image to the necessity for light to fall on a light detector.

**Question 7 (Standard Demand)**

- (a)(i) Nearly three quarters of candidates gained the mark by recognising the greater the altitude, the greater the period of orbit.
- (a)(ii) A very small minority of candidates gave correct answers, usually commenting on the small number of results and the unreliability of the internet as a source.

- (b) Many candidates gained one mark by mentioning the Earth's gravitational force. Few realised that this provided the centripetal force.
- (c) About a half of the candidates gained the mark. Some candidates did not gain this mark as they failed to make it clear that space does not contain a medium to transmit sound.
- (d) This question produced a wide variety of answers. Credit was given for answers relating for the need to explore other planets/galaxies, to find proof of the origins of the universe, discover minerals, habitable planets, aliens etc., as well as for arguments about the cost or inability to survive in space.

### **Mark ranges and award of grades**

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