Version 1.0 2/26/2010

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Physics 4451

PHY3F Unit Physics 3

Report on the Examination

2010 examination – January series

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Set and published by the Assessment and Qualifications Alliance.

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Physics
Foundation Tier PHY3F

General

Nearly all the question parts were attempted by the vast majority of candidates, although it was disappointing how many failed to mark anything on a diagram as requested and how many did not appear to have a ruler.

There were some examples of almost unreadable handwriting, sometimes because it was very faint or very small and there were frequent examples of poor spelling.

There was a reasonable response to the 'How Science Works' features of the paper but poorer responses to items based on more traditional content such as questions 1 and 8 on lenses and 6 on electro-magnetic forces.

Question 1 (Low Demand)

(a) (i) A great majority of candidates could describe the mirror as a plane mirror.

(a) (ii) Just under half of the candidates could name the normal.

(a) (iii) Three-quarters of the candidates knew that angle **Y** is the angle of incidence.

(a) (iv) Nearly all candidates realised that if angle **Y** is doubled then angle **Z** will double.

(b) (i) & (ii) Just over half of the candidates identified the concave lens as being diverging but only a quarter of the candidates could then accurately show the rays diverging on the diagram. A number of candidates showed the rays doing the opposite from the answer given in the previous item. A third of candidates did not get any marks on this item not even the 'straight through' mark.

Question 2 (Low Demand)

(a) Three-quarters of the candidates were able to mark the centre of mass on the plastic sheet in an acceptable place.

(b) Nearly all candidates were able to name the centre of mass of the triangle.

(c) Three-quarters of the candidates correctly chose that a plumb line hangs vertically.

Question 3 (Low Demand)

(a) The great majority of candidates were successful with parts (i), (ii) & (iii), but some found part (iv) harder where about two-thirds of candidates correctly chose 24 hours.

(b) (i) & (ii) Half of the candidates could identify the type of orbit for geostationary and monitoring satellites.

Question 4 (Low Demand)

(a) (i), (ii) & (iii) Nearly all candidates gave the correct mammals although fewer candidates were able to give a correct example of a frequency partly because a number used an incorrect unit, many candidates using kHz.

(b) (i) & (ii) Most candidates correctly identified the relevant diagrams but there is some confusion between how amplitude and frequency are shown diagrammatically and some candidates tended to answer from first impressions rather than looking carefully at the diagrams.

Question 5 (Low Demand)

(a) (i) & (ii) A large majority of candidates recognised that dust and gas are pulled together by gravitational attraction but only a quarter of candidates recognised that the energy given out is by their nuclei joining.

(a) (iii) Three-quarters of the candidates recognised that a star is stable when the gravitational forces balance the radiation pressure.

(b) (i) & (ii) Few candidates said more than a galaxy is a collection of stars and planets, but more than three-quarters of the candidates were able, this year, to name our galaxy as the Milky Way.

Question 6 (Low Demand)

(a) & (b) Nearly all candidates were able to do the first two items.

(c) (i) & (ii) Many candidates failed to read this correctly and gave answers in terms of magnets which had been precluded in the first sentence of the item. Only a quarter of candidates gained the mark in (c)(i), and even fewer obtained the mark for (c)(ii).

Question 7 (Standard Demand)

(a) & (b) Two thirds of candidates answered part (a) correctly. However, a number of candidates had difficulty with the terminology in this question answering parts (a) and (b)(i) in terms of names of planets, and (b)(ii) in terms of a variable.

(c) Just over half of the candidates were able to give the correct orbit time for a geostationary satellite round Mars.

(d) Three-quarters of the candidates answered correctly the question on the two moons of Mars.

(e) In this item, nearly all candidates gave the correct force causing the circular path but many candidates gave the answers speed and direction in the wrong places. Less than a quarter of the candidates stated them the correct way round.

Question 8 (Standard Demand)

(a) (i) Just over half of the candidates were able to work out the magnification.

(a) (ii) Just over half of the candidates could name the principal focus.

(a) (iii) Candidates had difficulty explaining how the diagram showed that the image was virtual, many candidates stated it was behind or in front of the lens without reference to the object and a number of answers mentioned reflected rays and /or mirrors.

(b) (i) Half of the candidates gave a correct explanation. A significant number of candidates appear to not understand the term 'directly proportional' and hence gave incorrect answers.

(b) (ii) & (iii) Only a minority of candidates gave the correct answer to why a conclusion could not be given outside the range of the experiment.

Mark Ranges and Award of Grades

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