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General Certificate of Secondary Education

Physics 4451

PHY3H Unit Physics 3

Report on the Examination

2010 examination – June series

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Physics
Higher Tier PHY3H

General

Questions 1 to 4 were standard demand, targeting grades C and D. Questions, 4 to 8 were high demand, targeting grades A* to B.

Candidates were able to access all questions with very few items not attempted by the vast majority of candidates. There was no evidence of candidates being unable to complete the paper in the time allocation.

Question 1 *(Standard Demand)*

(a) (i) A large majority of candidates correctly explained what was meant by the period of a planet.

(a) (ii) Almost all candidates gave a correct answer related to reliability.

(a) (iii) Virtually all candidates gave the correct relationship that as the distance increases so does the period.

(a) (iv) Over three quarters of candidates realised that there was no relationship.

(b) Virtually all candidates gave the correct answer as gravity.

(c) Virtually all candidates could name the Milky Way.

(d) Less than three quarters of candidates gave the correct answer as billions of galaxies.

Question 2 *(Standard Demand)*

(a) (i) Just over three fifths of candidates gave the correct frequency range. Clearly some candidates were simply guessing.

(a) (ii) Most answers were correct, the most common incorrect answers were supersonic and sonic.

(b) Just under half of candidates gave an acceptable answer, most of these were in terms of human rights and potential inequality.

(c) Well answered with the majority of responses correct. However, a significant number of candidates gave answers too vague to credit, such as ‘movement of the machine’.

(d) (i) A well answered part with most candidates scoring at least one mark. Some candidates failed to give any data to support the pattern described.

(d) (ii) Most candidates scored a mark for the idea of identifying anomalous results but very few candidates scored a second mark. Many candidates simply repeated the stem of the question or followed the reliability line of argument.

Question 3 ***(Standard / High Demand)***

(a) Just over half of the candidates gave a correct answer. Many candidates still seem to think that iron is used because it is a good electrical conductor.

(b) A large number of candidates thought the wire was insulated to stop energy losses or for safety purposes. Incorrect answers also showed many candidates think that potential difference flows. Only just over a third of candidates were able to give an acceptable answer.

(c) Nearly half of the candidates scored full marks. Those candidates who struggled either did not know which coil was the primary and which was the secondary, or were unable to rearrange the equation.
A significant number of candidates did not know that the unit for p.d. is the volt.

Question 4 ***(Standard / High Demand)***

(a) Many candidates failed to gain marks here as their responses were definite ie it is where all the mass is.

(b) Just over half of the candidates were able to make two clear comparative statements with a further quarter able to make one correct clear statement.

(c) Many responses were not worth a mark because candidates had not used the terms as instructed in the stem of the question. It was encouraging to note that the fuller answers often used the phrase 'resultant moment restores equilibrium' or words to that effect.

Question 5 ***(High Demand)***

(a) Under half of candidates were able to name the effect being demonstrated.

(b) (i) The majority of candidates managed a correct response, although a number of responses needed to be read through a few times as ideas were not expressed clearly.

(b) (ii) The majority of responses were correct.

Question 6 ***(High Demand)***

(a) Most candidates were able to complete the calculation and give the correct unit. However, a significant minority (about a third) were unable to give the correct unit or simply missed it out.

(b) Just under three quarters of the candidates were able to complete this calculation correctly.
A few candidates scored one mark for showing a correct method but incorrect numerical answer.

Question 7 ***(High Demand)***

(a) A significant number of candidates (approximately a quarter) failed to score any marks, with an equal number scoring all four. Many candidates, having completed the ray diagram, successfully omitted any arrows showing direction. It was perhaps fortunate

that marks were not awarded for the accuracy of the diagram as this was often poor. Independent marks meant that candidates were able to score one or two marks for image placement or ray direction even when their rays were more suitable for a mirror instead of the lens shown.

(b) Surprisingly just under half of candidates scored both marks. Many candidates lost credit by producing a long list of features that were often contradictory.

Question 8 *(High Demand)*

(a) Most candidates gave at least one of the correct responses although some lost credit by listing contradictory points. Some candidates gave the full life story of a star which necessitated the use of additional pages even though they had gained the marks in the first sentence.

(b) Only a minority of candidates gained the two marks by recognising radiation pressure as one of the factors involved. A significant number of candidates gave correct responses in terms of fusion although a minority of candidates gave answers involving either fission or the burning of hydrogen.

(c) As in part (a), candidates gave very long responses requiring extra sheets or answers out of the clip area; in some of these longer responses, candidates contradicted themselves. Most candidates gained one mark for 'supernova' but very few gave a correct explanation of what happens next.

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