



General Certificate of Education

Physics 5451/6451

Specification A

PHA3/C Coursework

Report on the Examination

2007 examination - January series

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General Comments

Administration procedures were usually completed correctly with Centre Mark sheets and samples of candidates work reaching the moderators by the prescribed deadline.

Mark adjustments were again mainly due to misinterpretation of specific points in the assessment criteria. This usually involved skills A4c (fully labelled diagrams), B6a (significant figures), C4c (graphs) and D4b (error estimation). Annotation was generally of a high standard. Although most centres applied the hierarchical scheme correctly, there were still a small number of cases where marks were incorrectly totalled. This was usually because a suitable mark grid had not been used, making it difficult to see the overall pattern of marks awarded for each skill area.

Almost all the investigations used were appropriate, allowing candidates access to the full range of assessment criteria. Electrical experiments accounted for most of the work submitted.

The advice which follows addresses issues raised by moderators on the marking of specific skills. All of these points were again discussed in the recent series of Teacher Support Meetings held last autumn.

In skill A diagrams were again a particular concern. To achieve A4c candidates must clearly indicate any lengths being measured. This is particularly important in resistivity experiments where candidates must show precisely where the length of wire is measured between the electrical connection points. The wire should also be shown tightly stretched rather than a 'wavy' line. In A4a a 'detailed plan' should include a full description of the proposed experiment. In some candidates work only brief details of the procedure were given, failing to describe how 'key' measurements were taken. For A 4b and A6a (variables), candidates should clearly state the physical quantities being varied and kept constant. To achieve A6d, full instrument specification is required, and for electric meters this requires both range and sensitivity.

In skill B significant figures (B6a) was the main cause for concern. This usually involved length measurements where candidates had used metre rules stated as being accurate to the nearest mm, but only quoting measured lengths to the nearest cm. Many candidates also failed to identify significant errors for skill B6d.

In skill C graph scales were again a problem for some candidates. To achieve C4c an appropriately large scale must be used on A4 graph paper. Each scale must be chosen so that the plotted points occupy more than half the length of each axis. Some centres awarded C4c for graphs with no titles, missing units on axes and where the plotted points occupied less than a quarter of the area of the paper. (This would effectively limit the mark for skill C to a maximum of three).

In skill D the majority of candidates scored significantly less than in other skill areas. Comments made by candidates were often superficial or too vague, with many candidates failing to address at least one of the four marking points in D2 and thereby effectively limiting their mark to a maximum of one. In particular, for D2b a simple statement about discrepancies or anomalous results was required. For D2c candidates must state whether there is much variation in their repeated results, indicating the level of uncertainty in the data. In D4b candidates frequently calculated errors based on instrument sensitivity only. Where possible, the error estimate should be based on the spread of repeated results. Eg in a resistivity experiment the error in length might reasonably be estimated from the sensitivity of the metre rule ($\pm 1\text{mm}$). The error in diameter might also be estimated from the sensitivity of the micrometer ($\pm 0.01\text{mm}$) The percentage error in diameter can then be doubled to give the error in cross sectional area.

The error in resistance, however, should be estimated from the spread of repeated voltmeter/ammeter readings and not the sensitivity of the meters used.

Mark Ranges and Award of Grades

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