General Certificate of Education
Advanced Subsidiary Examination
June 2011

Physics PHY3T/Q11/TN

Unit 3 Investigative and Practical Skills in AS Physics

Investigative Skills Assignment (ISA) Q

Instructions to Supervisors

Confidential

- These instructions are provided to enable centres to make appropriate arrangements for the Unit 3 ISA Q test.
- For further details of the administration of the ISA and for information about these instructions, please see the document *Guidance Instructions for the Administration of Investigative Skills Assignment (ISA): GCE Physics.*

ISA (Q) Resistivity of a Metal Wire

Centre Instructions for the Investigation

In this ISA, candidates will be expected to set up a circuit to measure the pd across and the current in a metal wire, and then to determine the resistance for different lengths of the wire.

Information for centres

Candidates should be told about one week before undertaking Stage 1 of the ISA that they will be investigating the resistance of different lengths of a wire and determining the resistivity of the metal of the wire.

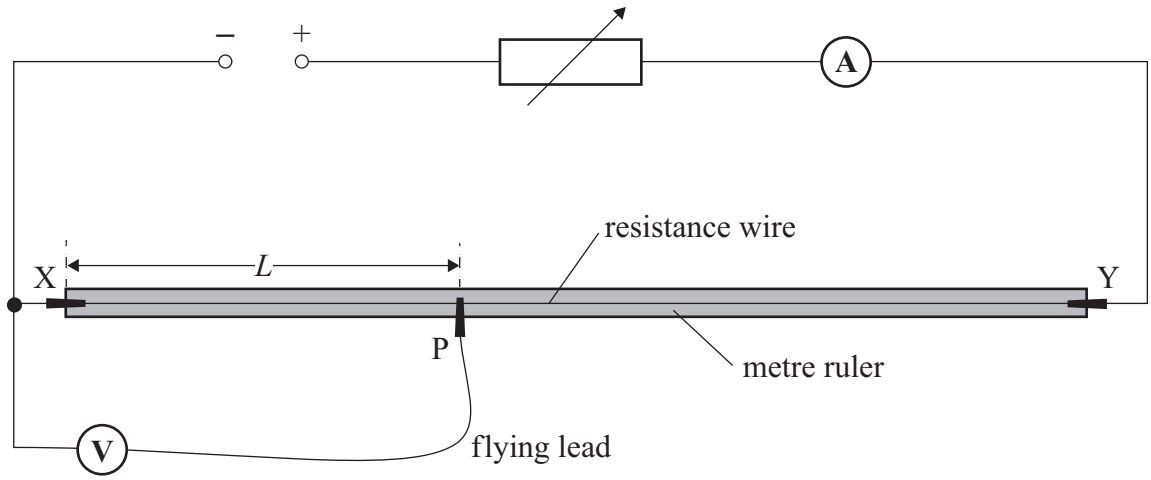
Stage 2 of the ISA (the written test: Sections A and B) should take place as soon as possible after Stage 1.

Apparatus

Centres should ensure that the apparatus provided can be used safely. Each candidate will need:

(a) approximately 1.1 m of 28 swg constantan resistance wire (resistance approximately 5 Ω). Alternatively a different resistance wire of the same length may be used (see below)
(b) a metre ruler
(c) dc voltmeter, at least 0 to 5 V range, precision 0.1 V or better
(d) dc ammeter, at least 0 to 3 A range, precision 0.1 A or better
(e) dc power supply set to 5 V (or a suitable value for the wire used: see below)
(f) a variable resistor (a 5 A, 12 Ω rheostat is suitable), however if the power supply has a continuous range control, this can be used instead
(g) three crocodile clips labelled X, Y and P with a lead attached to each
(h) connecting leads.

The resistance wire should be gently straightened and attached along the length of metre ruler using adhesive tape at each end. The crocodile clips with the leads attached should be clipped as shown on the diagram below. The candidates will be asked to complete the circuit.



If a resistance wire of a different gauge and/or a different metal is used, the voltage of the power supply should be set to a value approximately numerically equal to the resistance of the wire in ohms to give a current of about 1 A with the variable resistor set at zero resistance. Centres using continuously varying power supplies should inform candidates that the variable resistor will not be required.