



General Certificate of Education
Advanced Level Examination
June 2013

Physics

PHY6T/P13/TN

Unit 6 Investigative and Practical Skills in A Level Physics

Investigative Skills Assignment (ISA) P

Instructions to Supervisors

Confidential

- These instructions are provided to enable centres to make appropriate arrangements for the Unit 6 ISA P 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 (P) Pressure – volume relationship for gases

Centre instructions for the investigation

In this ISA, candidates will be investigating the relationship between the pressure and the volume of a fixed mass of gas.

Information for centres

Candidates should be told approximately one week before undertaking Stage 1 of the ISA that the investigation will be about the relationship between pressure, volume and temperature of a gas.

Stage 2 of the ISA (the written tests: Sections A and B) should be given as soon as possible after the practical investigation.

Apparatus

Each candidate will require:

- (a) 10 ml disposable plastic syringe
- (b) stand and clamp to support the syringe
- (c) 30 cm or half-metre ruler
- (d) 100 g slotted mass hanger and 9×100 g slotted masses
- (e) loop of string/cord attached to the handle of the syringe so that the slotted mass hanger can be suspended from it.

The piston in the syringe should be adjusted so that it contains about 6 ml of air. The end of the syringe should be sealed by heating or with suitable glue. Mark on the syringe the initial position of the unloaded piston.

The syringe should be clamped above the piston to ensure free travel as the piston moves down. Allow sufficient distance above the bench for the mass hanger plus about 150 mm of free travel.

The internal cross-sectional area, A in m^2 , should be provided for each candidate, and quoted to 2 significant figures. (This can be determined by measuring to the 10 ml mark and using $A = \frac{\text{volume}}{\text{distance}}$ or by measuring the internal diameter of the syringe).

For the syringes used in testing $A = 1.9 \times 10^{-4} \text{ m}^2$.

Figure 1