General Certificate of Education
Advanced Subsidiary Examination
June 2013

Physics PHY3T/P13/TN

Unit 3 Investigative and Practical Skills in AS Physics

Investigative Skills Assignment (ISA) P

Instructions to Supervisors

Confidential

- These instructions are provided to enable centres to make appropriate arrangements for the Unit 3 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) Investigation of three forces in equilibrium

Centre Instructions for the Investigation

In this ISA candidates will investigate how the angle between two supporting strings varies for different loads.

Information for centres

Candidates should be told approximately one week before undertaking Stage 1 of the ISA that the investigation will be about the equilibrium of the three forces acting when a weight is supported by two strings.

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

Apparatus

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

(a) two stands, each with a boss and a clamp

(b) a metre ruler

(c) two identical short springs with a spring constant of about 25 Nm^{-1} : standard *expendable steel springs* are suitable. If pre-stretched springs are used they must have the same initial length

(d) a 30 cm ruler or a half-metre ruler

(e) a protractor, scale division 1°

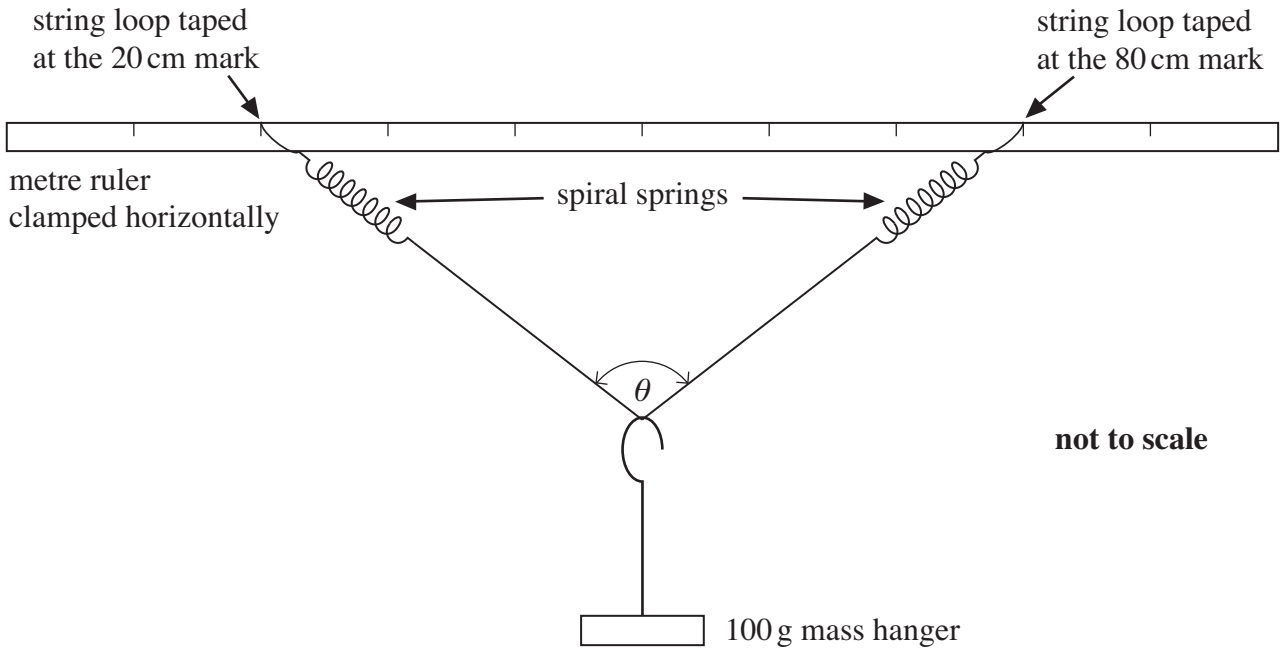
(f) a 100 g mass hanger with five 100 g slotted masses

(g) two identical thin string loops for attaching the springs to the metre ruler

(h) a length of thin string and some sticky tape.

The apparatus should be assembled for each candidate as shown in **Figure 1**. The diagram is not to scale.

Figure 1



- The string connecting the two springs should be about 45 cm in length.
- The system should be symmetrical with the connecting string clearly marked at the point (directly below the 50 cm mark on the ruler) at which the hanger is supported. This is to allow the candidate to remove the mass hanger and then replace it in the same position.
- The angle θ with just the 100 g mass hanger in place should be between 100° and 150°.