



CASPA-INTER-REGIONAL MOCK EXAMINATION-CASPA-IRMEX BOARD	SUBJECT CODE NUMBER 0780	PAPER NUMBER 3
	SUBJECT TITLE PHYSICS	
CANDIDATE NAME: CANDIDATE NUMBER: CENTRE NUMBER:		
ADVANCED LEVEL	DATE: To be scheduled by the school	

PAPER NUMBER: 3

Two and a half hour

INSTRUCTIONS

ANSWER ALL QUESTIONS

Do not write in pencil except for graphs.

If you have difficulty understanding the requirements of the question, or other problems, you should ask the supervisor for advice.

Your result must be recorded in the spaces provided in this question book. No further descriptions of the experiments are required. Candidates must allow themselves enough time to complete and check their calculations where these are required. In calculations, you are advised to show all steps in your working.

Credit will be given for a written account of the experiment including a diagram. The account should only consider points extra to those in the questions such as techniques adopted to carry out the required procedure and special precautions taken to ensure accuracy.

Stations:

Candidates are advised to give a description of each test carried out, diagram(s) of the set up, relevant calculations and/or identification of device(s). Methods used should be very clear.

The approximate mark distribution is as follows:

- **Diagram, precautions and presentation** **06 marks**
- **Observations** **20 marks**
- **Graphs** **07 marks**
- **Calculations** **07 marks**
40 marks
- **Stations (4)** **40 marks**
- **SBA** **20 marks**

In this experiment, you will be verifying the principle of moments. You will be using the following material: Two disposable plastic cups with string handles, one 70 cm long piece of twine, one 40 cm long piece of twine, a metre rule, a rigid wooden bar (about one metre long), a tall stand with clamps and a set of masses

Instructions

1. At one end of the 70 cm long string, make a loop through which the wooden bar can pass freely.
2. Tie the other end of the string to the clamp, up the stand.
3. Pass the wooden bar through the loop and suspend it roughly from its midpoint (O). Keep the bar horizontal with your hand.
4. Put a large known mass (M) of about 100 g in one plastic cup (A) and a smaller known mass in the other plastic cup (B).
5. Suspend A from the bar using its handle, so that it hangs freely on it, at a distance of about 35 cm from O.
6. Measure and record the horizontal distance x between O and A.
 $x = \dots\dots\dots$ (1 mark)
7. Suspend B from the bar on the other side of O and keep on adjusting its position until the bar becomes horizontal again and remains so.
8. Measure and record the horizontal distance l between O and B and the corresponding mass m in B.
 $l = \dots\dots\dots$ (1 mark)
 $m = \dots\dots\dots$ (1 mark)
9. Increase the mass m in B and keep on adjusting its position until the bar is again horizontal and repeat steps (7) and (8) to obtain other values of m and l .

10. Table of Data (21 marks)

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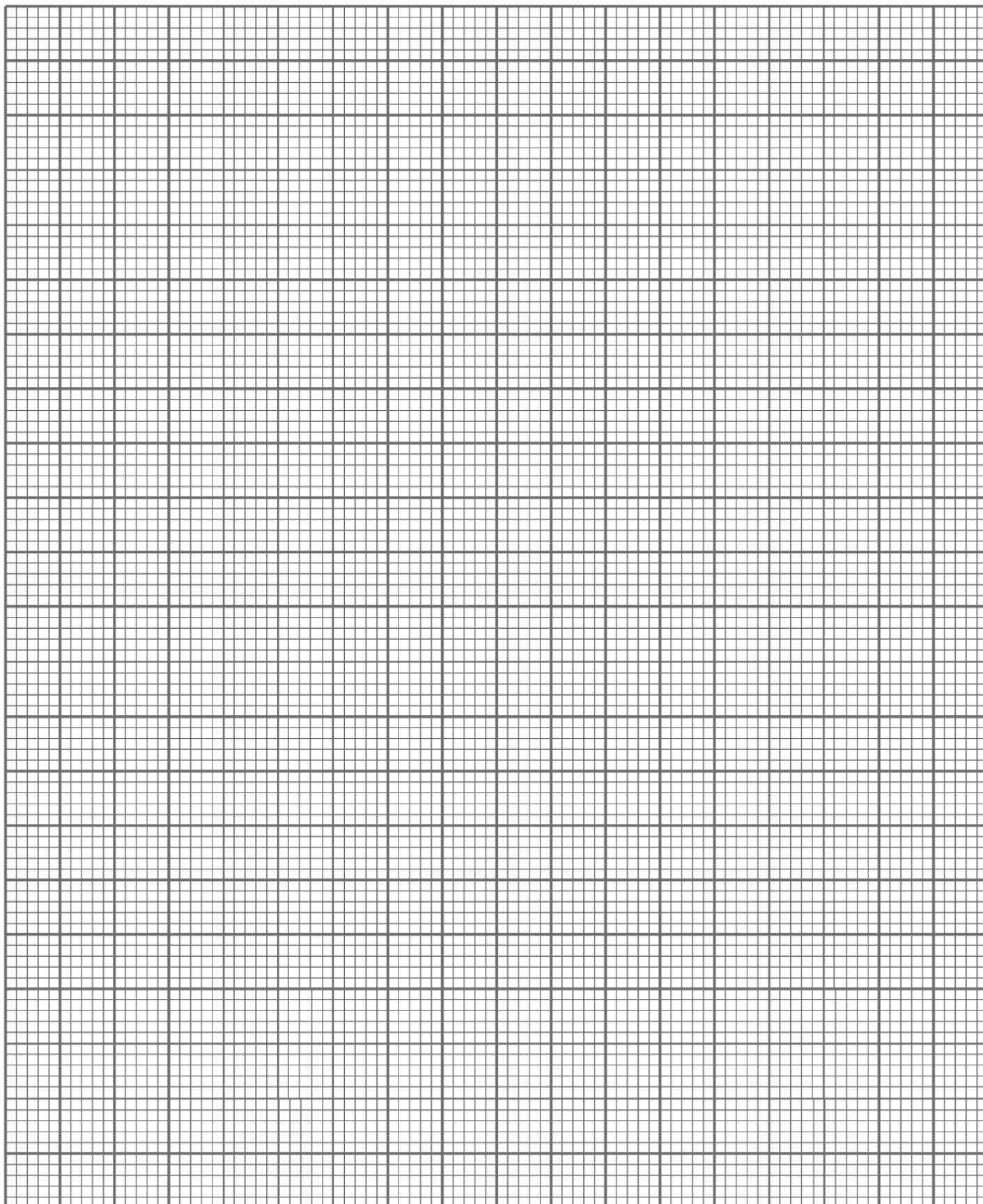
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11. Plot a graph of m as ordinate against $\frac{1}{l}$ as abscissa.

(7 marks)



12. Determine the slope S_1 of the graph.

(3 marks)

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13. Calculate $Q = M \cdot x$ and compare it with the value of the S_1

(2 marks)

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14. Comment your result.

(1 mark)

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15. Precaution

(1 mark)

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16. Diagram

(2 marks)

STATIONS

Station 1: Determining the length of a string using simple harmonic motion.

You are provided with a string, a pendulum bob, clamp and stand and a stop watch. Using the method of S.H.M, determine the length of the string.

Diagrams (2 marks)

Method and precautions (2 marks)

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Data collected (2 marks)

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Calculations (3 marks)

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Precaution (1 mark)

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Station 2: Estimating the internal resistance of a battery

You are provided with an ammeter, a voltmeter, a resistor, and a battery in its holder.

1. Use colour codes to determine the nominal value (R) of the resistance of the resistor.

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R = (2 marks)

2. Measure the Emf (E) of the battery.

E = (1 mark)

3. Connect the battery in series with the resistor and the ammeter and note the ammeter reading (I).

Measure the potential difference (V_2) across the battery with another voltmeter while the circuit is still connected.

I = (1 mark)

V_2 = (1 mark)

4. Diagrams

(2 marks)

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5. Determine the internal resistance of the battery.

(2 marks)

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6. Precaution

(1 mark)

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Station 3: Estimating the focal length of a convex lens

You provided with a convex lens, a lens holder, a meter rule and a white sheet of paper. Determine the focal length of the lens

Diagram

(2 marks)

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Method

(2 marks)

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Observation

(2 marks)

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Inference

(2 marks)

Conclusion

(2 marks)

Station 4: Determination of the specific heat capacity

You are provided with 50 cm³ of liquid B, a spring balance, a measuring cylinder, hot water with a plastic cup and a thermometer. Determine the specific heat capacity of the liquid B.

Diagram

(2 marks)

Method

(2 marks)

Observation

(3 marks)

Calculation

(2 marks)

Precaution

(1 marks)