TEST CODE **01230032**

FORM TP 2005102

MAY/JUNE 2005

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

INTEGRATED SCIENCE
(Single-award)

Paper 03/2

General Proficiency

PRACTICAL PAPER

2 $\frac{1}{2}$ hours

READ THE FOLLOWING DIRECTIONS CAREFULLY

1. Candidates MUST use this answer booklet when responding to the questions. For EACH question, write your answer in the space indicated and return the answer booklet at the end of the examination.

2. This test consists of THREE questions. You should attempt **ALL** questions.

3. Each question is divided into parts. Each part measures a particular skill. The allocation of marks to the skill within each part is given at the end of that part.

4. **Be sure to read ALL instructions completely and carefully before you begin the questions.**

N.B. Candidates are allowed to have practical notebooks and/or any materials relevant to the practical examination.

Candidates may be given additional materials without penalty.

If candidates lose time during the examination through no fault of their own, they must be awarded the equivalent time.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

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1. You are provided with the following apparatus:

1 metre rule with a hole in the middle
1 long metal rod or a sturdy knitting needle
1 piece of plasticine
1 retort stand
Weights of the following masses with attached string: 100 g, 80 g, 60 g, 50 g

Carry out the instructions below:

(a) Securely clamp the metal rod/knitting needle to the retort stand.

(b) Balance the metre rule on the metal rod/knitting needle as shown in the diagram in Figure 1. Use plasticine to balance the weights.

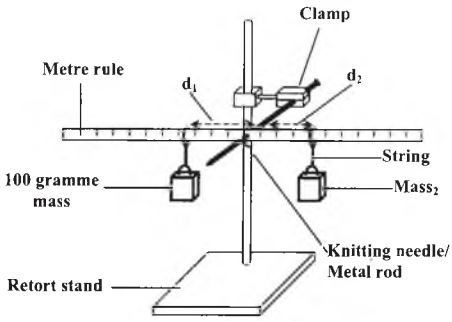


Figure 1. Apparatus for investigation in Question 1

(c) Place the 100 g mass (**$Mass_1$**) 10 cm (d_1) away from the hole on the metre rule.

(d) Place the 80 g mass (**$Mass_2$**) on the other side and move it along the rule until it is balanced.

(e) In Table 1, record the distance (d_2) between the rod and $Mass_2$.

(f) Repeat steps (c) to (e), placing the 100 g mass 20 cm away from the hole in the center.

(g) Repeat steps (c) to (f), using the 60 g mass in place of the 80 g mass.

(h) Repeat steps (c) to (f), using the 50 g mass. **(6 marks)**

GO ON TO THE NEXT PAGE

(i) Using your results after following instructions (c) to (e), complete Table 1 below.

TABLE 1. RESULTS OF INVESTIGATION 1

Mass$_1$ (g)	**Distance from center d_1 (cm)**	**Mass$_2$ (g)**	**Distance from center d_2 (cm)**	**$m_1 \times d_1$**	**$m_2 \times d_2$**
100	10	80			
100	20	80			
100	10	60			
100	20	60			
100	10	50			
100	20	50			

(12 marks)

(j) The procedures (a) to (i) are used to investigate the principle of moments.

Suggest an alternative term for

a) Mass$_1$ _____

b) Mass$_2$ _____

c) the hole at the center of the metre rule. _____

(3 marks)

(k) Name ONE machine which operates by the principle of moments.

_____

(1 mark)

Total 22 marks

2. Plan and design an experiment which uses the principle of moments to determine the mass of an unknown object. Draw and label a diagram of the apparatus which you would use.

Diagram of apparatus to determine the mass of an unknown object

(12 marks)

Total 12 marks

3. (a) Using the bulb, batteries, wire, and electrodes, set up an electrical circuit as shown in Figure 2 below to be placed in EACH of the EIGHT solutions provided.

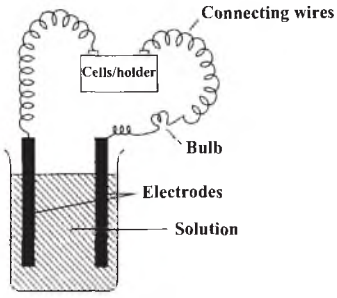


Figure 2

Place the electrodes into each of the solutions provided and observe the brightness of the bulb. **(5 marks)**

(b) Record the relative brightness of the bulb in EACH solution in Table 2 below.

TABLE 2. OBSERVATIONS

Solution	Observations
Sodium chloride	
Sulphuric acid	
Water	
Ethanoic acid	
Sugar solution	
Starch solution	
Orange juice	
Rubbing alcohol	

(8 marks)

(c) In Table 3 below, classify the solutions as conductors and non-conductors.

TABLE 3

Solutions that are conductors	Solutions that are non-conductors

(4 marks)

(d) (i) Which solution in Table 3 is the best conductor?

_____

(1 mark)

(ii) Give ONE reason for your selection in (d) (i).

_____

(1 mark)

(e) State another name for a non-conductor.

_____

(1 mark)

Total 20 marks

END OF TEST