TEST CODE **01230032**

FORM TP 2007101

MAY/JUNE 2007

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

INTEGRATED SCIENCE
(Single-Award)

Paper 03/2

General Proficiency

PRACTICAL PAPER

2½ hours

READ THE FOLLOWING DIRECTIONS CAREFULLY

1. You 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 TWO questions. You should answer **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. **You MUST 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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Answer ALL questions.

1. You are provided with the following:

- Four different types of soil samples labelled A, B, C and D
- Four boiling tubes
- Four spatulas
- Four rubber bungs
- Universal indicator paper
- Universal indicator colour chart
- Dropper
- Four test tubes
- One test tube rack
- Distilled water

Proceed as indicated below.

(a) Half-fill EACH of the four boiling tubes with one of the soil samples: A, B, C and D. Place EACH tube in the test tube rack. **(1 mark)**

(b) Add distilled water to EACH boiling tube until it is almost full and observe the appearance of the contents in the tube. **(1 mark)**

(c) Record your observations in the space provided below.

A: _____

_____

B: _____

_____

C: _____

_____

D: _____

_____

(2 marks)

(d) Cover EACH boiling tube with a rubber bung and shake for a few minutes. **(1 mark)**

(e) Allow the tubes to settle for 5 minutes and observe the appearance of the contents in the tubes. Record your observations in the space provided below.

A: _____

_____

_____

B: _____

_____

_____

C: _____

_____

_____

D: _____

_____

_____

(4 marks)

(f) In the space provided below, draw a diagram of one of the boiling tubes to show the appearance of the soil.

(4 marks)

(g) Using a dropper, transfer a small quantity of EACH soil suspension to separate test tubes. **(1 mark)**

(h) Use the universal indicator paper to check the pH of EACH of the soil samples, A, B, C and D. **(1 mark)**

(i) Insert an appropriate table below and record your results in it.

(3 marks)

(j) Using your universal indicator colour chart, estimate the pH of EACH of the soil samples and complete the table below.

Soil Sample	Estimated pH of Sample
A	
B	
C	
D	

(4 marks)

(k) Plan and design an experiment to confirm that of the four soil samples, A, B, C and D, the **most** suitable one for growing carrots is Sample C. **(7 marks)**

Total 29 marks

2. You are provided with the following materials and pieces of apparatus:

- 50 cm^3 1M sodium hydroxide (NaOH) solution
- 50 cm^3 1M hydrochloric acid (HC1) solution
- 1 styrofoam cup
- 1 thermometer
- 1 measuring cylinder
- 1 stirring rod

Proceed as indicated below.

(a) Using your measuring cylinder, place 25 cm^3 of NaOH solution into the styrofoam cup. **(1 mark)**

(b) Leave the sodium hydroxide solution for 5 minutes and then record the temperature. **(1 mark)**

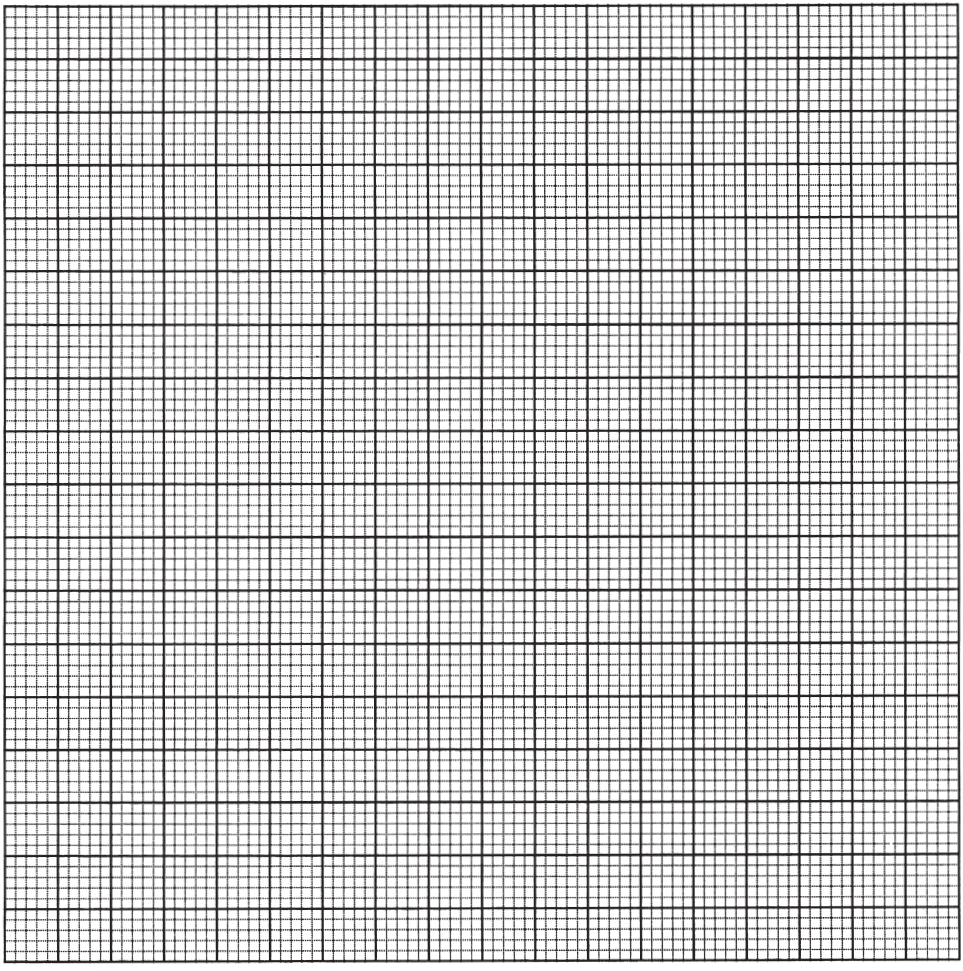
(c) Measure 5 cm^3 of HC1 and add to the styrofoam cup. Stir the mixture and record the temperature in degrees Celsius or Centigrade (°C). **(2 marks)**

(d) Repeat (c) above ten times. **(1 mark)**

(e) Insert an appropriate table below and record your observations in it.

(8 marks)

(f) On the axes provided below, draw a graph of volume of acid added against temperature in degrees Celsius (°C).



(6 marks)

(g) Write a word equation for the reaction which is occurring.

_____

_____

(2 marks)

(h) What type of reaction is this?

_____

_____

(1 mark)

(i) For what volume of acid is the maximum quantity of heat energy evolved?

_____

_____

(2 marks)

(j) Why was a styrofoam cup used in performing this experiment?

_____

_____

(1 mark)

Total 25 marks

END OF TEST