CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

17 JANUARY 2019 (p.m.)

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FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE | 0 | 1 | 2 | 3 | 8 | 0 | 3 | 2 |

SUBJECT PHYSICS – Paper 032

PROFICIENCY GENERAL

REGISTRATION NUMBER | | | | | | | | | | |

SCHOOL/CENTRE NUMBER					

NAME OF SCHOOL/CENTRE

CANDIDATE'S FULL NAME (FIRST, MIDDLE, LAST)

DATE OF BIRTH | D | D | M | M | Y | Y | Y | Y |

SIGNATURE _____

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702

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FORM TP 2019026

TEST CODE 01238032

JANUARY 2019

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

PHYSICS

Paper 032 – General Proficiency

Alternative to SBA

2 hours 10 minutes

702

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of THREE questions. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. Where appropriate, ALL WORKING MUST BE SHOWN in this booklet.
5. You may use a silent, non-programmable calculator to answer questions, but you should note that the use of an inappropriate number of figures in answers will be penalized.
6. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
7. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

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

0 1 2 3 8 0 3 2 0 3

Answer ALL questions.

1. In this experiment you are required to investigate the relationship between the length, *l*, and the period, T, of a pendulum.

You are provided with the apparatus shown in Figure 1 below. The pendulum is 0.75 m in length.

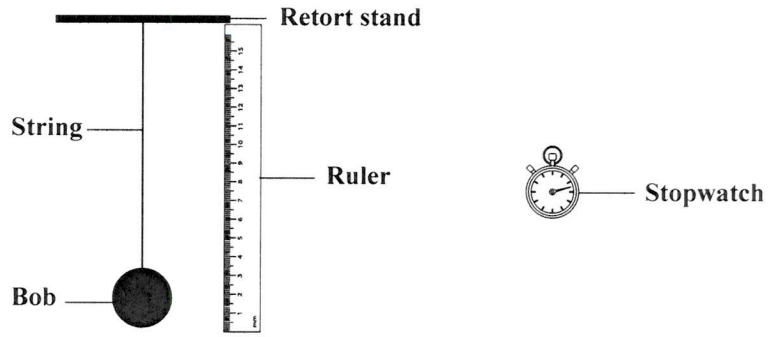

Figure 1. Simple pendulum

Step 1: Start the pendulum oscillating with a small angle of swing in one plane.
Step 2: Using the countdown method, or otherwise, record the time, t, for 20 oscillations.
Step 3: Adjust the length, *l*, of the pendulum for values in Table 1 and repeat Step 2.

(a) Record the times for 20 oscillations, t, in Table 1 below. **(2 marks)**

TABLE 1: RESULTS

Length, *l*/m	Time, t/s	Period, T/s	Period^2, T^2/s^2
0.10			
0.20			
0.25			
0.50			
0.60			
0.75			

(b) Calculate the Period, T, and Period^2, T^2, and record the results in Table 1. **(2 marks)**

(c) **On page 5**, plot a graph of T^2 against *l*. **(8 marks)**

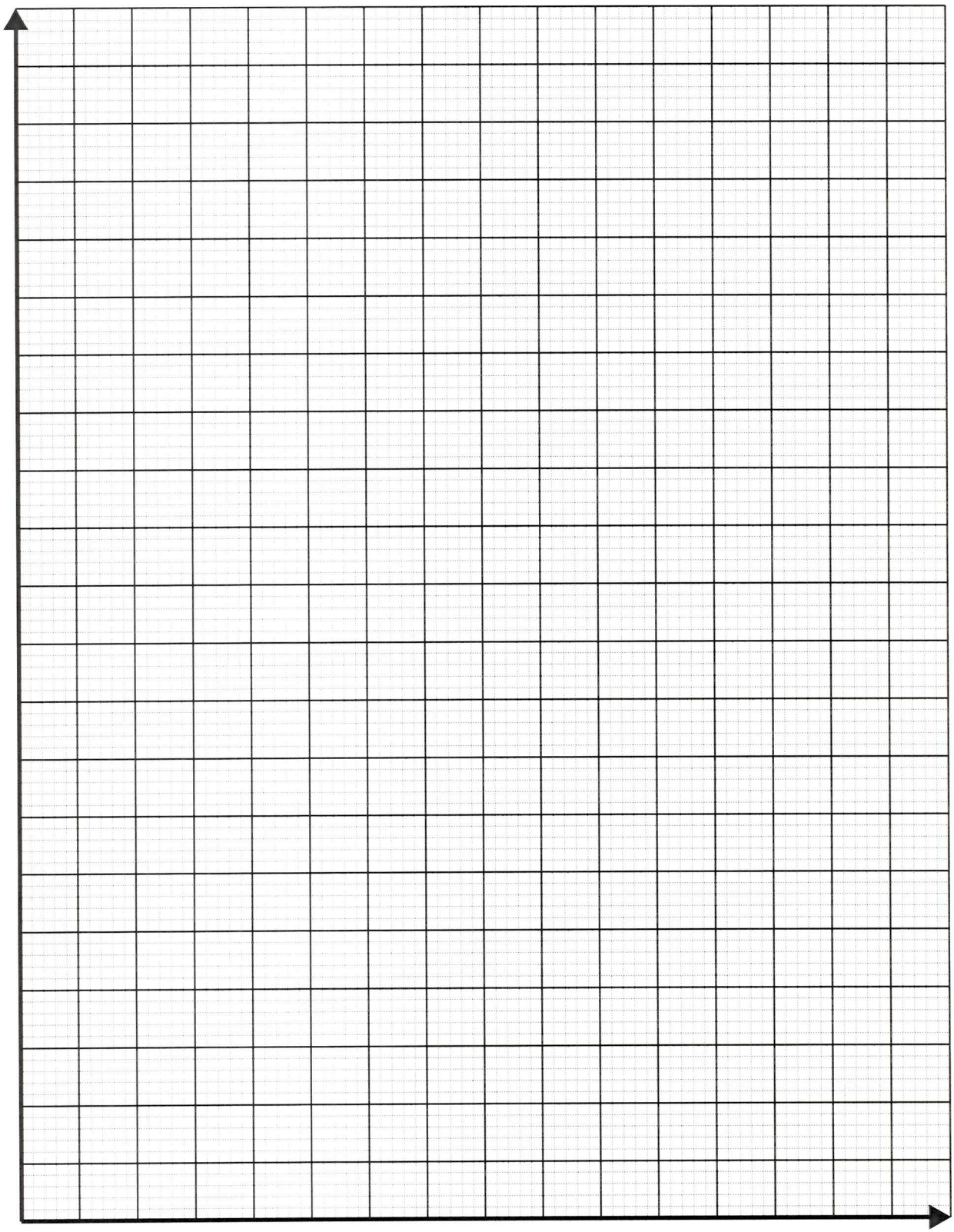

Figure 2. Graph of T^2 against l

(d) Calculate the gradient, S, of the graph.

(5 marks)

(e) State the relationship between T^2 and l.

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(2 marks)

(f) State TWO precautions that should be taken in this experiment.

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(2 marks)

Total 21 marks

2. A group of fifth form students was given a School-Based Assessment to investigate the relationship between voltage, V, and current, I, for a light bulb.

(a) Draw a circuit diagram of the apparatus which would be used by the students to determine the resistance of the light bulb. The circuit diagram MUST include the following components:

- dc supply
- Switch
- Variable resistor
- Voltmeter
- Ammeter
- Light bulb

(6 marks)

(b) Outline the procedure which the students would use to investigate the relationship between voltage, V, and current, I, for a light bulb.

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(3 marks)

GO ON TO THE NEXT PAGE

(c) A graph of voltage, V/V, against current, I/A, is shown in Figure 3.

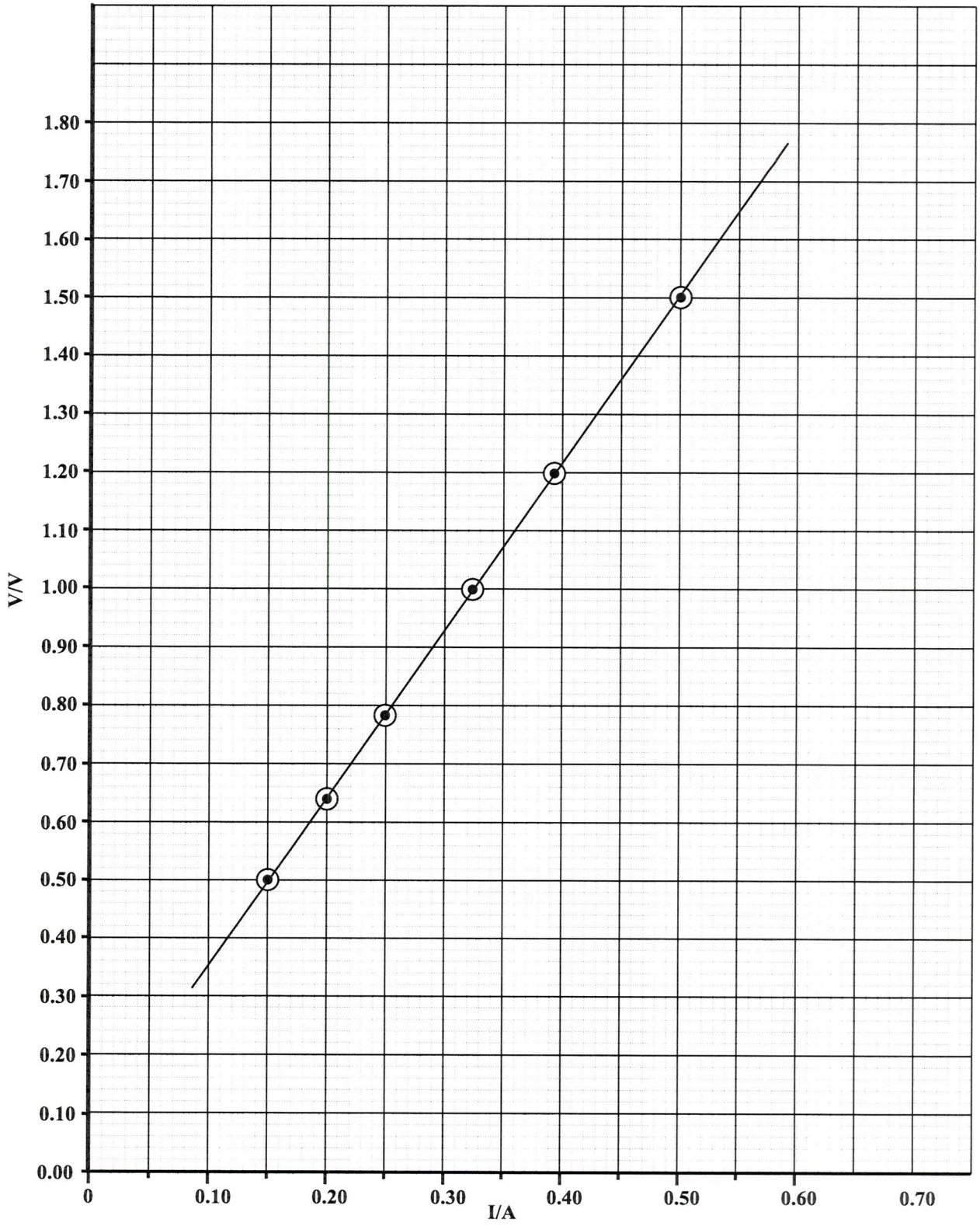

Figure 3. Graph of voltage, V/V, against current, I/A

Complete Table 2 below by inserting the following:

(i) The voltage value and current value for EACH of the six plotted points

(ii) The calculated resistance value for EACH of the six plotted points

TABLE 2: VOLTAGE AND CURRENT

Voltage, V/V	Current, I/A	Resistance, R/Ω

(4 marks)

(iii) Determine the average resistance of the light bulb in the circuit.

(2 marks)

(d) The present light bulb is replaced with a resistor of resistance 3.96 Ω. The circuit is closed and the voltage is recorded as 1.9 V. Calculate the current passing through this new resistor.

(2 marks)

Total 17 marks

3. A student is provided with three unlabelled radioactive sources: an alpha particle emitter, a beta particle emitter and a gamma ray emitter.

Design an experiment which will help the student to identify EACH radioactive source based on its penetrating properties. Your answer should include the following:

(a) Apparatus

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(3 marks)

(b) Method

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(3 marks)

(c) ONE safety precaution

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(1 mark)

(d) Expected results

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(3 marks)

Total 10 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

EXTRA SPACE

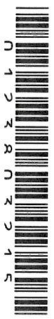
If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. [ ]

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. [ ]



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CANDIDATE'S RECEIPT

INSTRUCTIONS TO CANDIDATE:

1. **Fill in all the information requested clearly in capital letters.**

TEST CODE: | 0 | 1 | 2 | 3 | 8 | 0 | 3 | 2 |

SUBJECT: PHYSICS – Paper 032

PROFICIENCY: GENERAL

REGISTRATION NUMBER: | | | | | | | | | | |

FULL NAME: _____

(BLOCK LETTERS)

Signature: _____

Date: _____

2. **Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.**

3. **Keep it in a safe place until you have received your results.**

INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: _____
Supervisor/Invigilator

Date: _____

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