CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

29 MAY 2019 (a.m.)

M 1 9 0 1 2 3 8 0 3 2

FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

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

SUBJECT PHYSICS – Paper 032

526

PROFICIENCY GENERAL

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

SCHOOL/CENTRE NUMBER					

NAME OF SCHOOL/CENTRE

A000

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

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

SIGNATURE _____

DO NOT
WRITE ON
THIS PAGE

FORM TP 2019101

TEST CODE 01238032

MAY/JUNE 2019

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

PHYSICS

Paper 032 – General Proficiency

Alternative to SBA

2 hours 10 minutes

526

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.

526

NOTHING HAS BEEN OMITTED.

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Answer ALL questions.

1. Use the apparatus listed below to investigate the relationship between current (I) and potential difference (V) for an unknown device labelled X.

APPARATUS AND MATERIALS

- Match box with protruding leads labelled C and D
- 6 V, DC power supply
- Connecting wires
- Ammeter [0–1 A]
- Voltmeter [0–5 V]
- Rheostat
- Switch

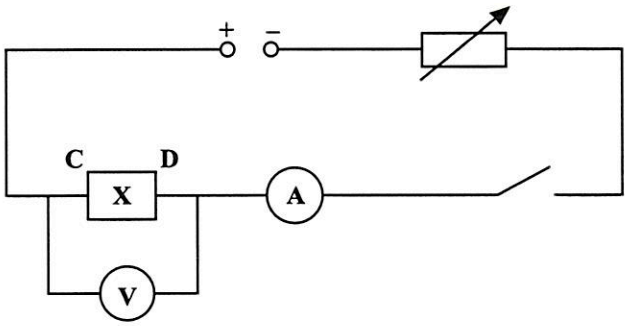

Figure 1. Circuit diagram

PROCEDURE

Step 1: Set up the circuit as shown in Figure 1 with the rheostat set at maximum resistance.

Step 2: Record the ammeter, A, and voltmeter, V, readings in Table 1 **on page 7**.

Step 3: Use the rheostat to vary the resistance to obtain TWO more readings.
[Do NOT exceed 1 A.]

Step 4: Reverse the connections to X and REPEAT Step 3 for THREE additional readings.

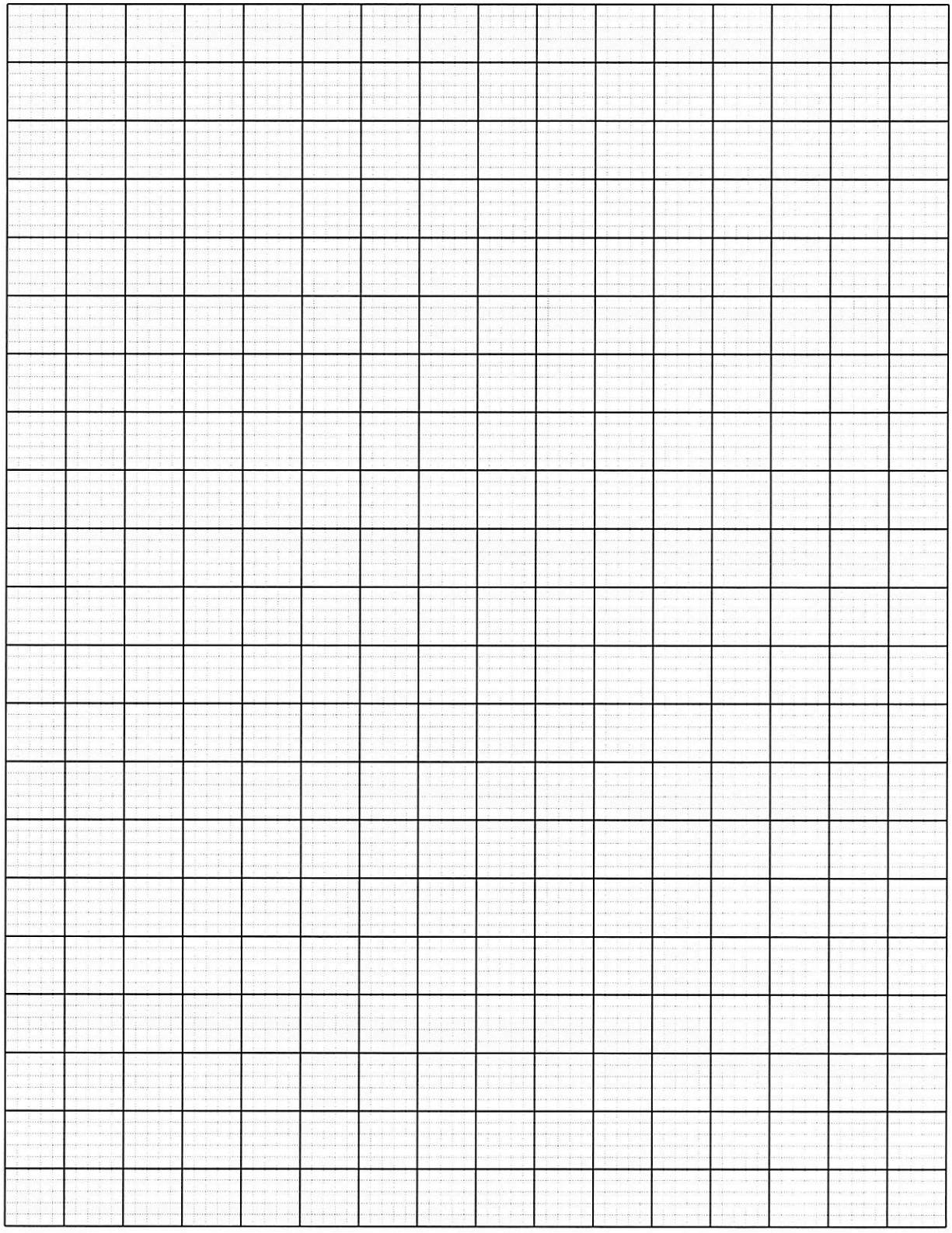

Figure 2. Graph of current, I/A against potential difference, V/V

GO ON TO THE NEXT PAGE

(a) Complete Table 1 below.

TABLE 1: AMMETER AND VOLTMETER READINGS

Current, I/A	Potential Difference, V/V

(4 marks)

(b) On the grid **on page 6**, plot a graph of current, I/A, against potential difference, V/V.

(8 marks)

(c) Use the graph to determine the gradient, G.

(5 marks)

(d) Use the gradient, G, obtained in (c) to determine the resistance of the unknown device, X, in ohms.

(2 marks)

(e) Explain whether or not the device X is ohmic.

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(2 marks)

Total 21 marks

NOTHING HAS BEEN OMITTED.

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2. In an experiment to investigate the refraction of light through a glass block, a student sets up the following arrangement as shown in Figure 3.

(a) Draw the path taken by the ray of light through and emerging from the glass block.

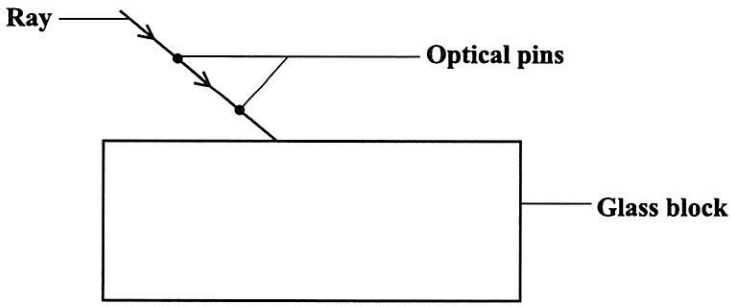

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Figure 3. Glass block

(3 marks)

(b) A graph of the student's results is shown **on page 11**. Use the graph to complete Table 2 below.

TABLE 2: RESULTS

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	$\mathbf{Sin\theta_1}$	$\mathbf{Sin\theta_2}$
1	0.17	
2	0.35	
3		0.33
4	0.65	
5		0.51
6		0.58

(6 marks)

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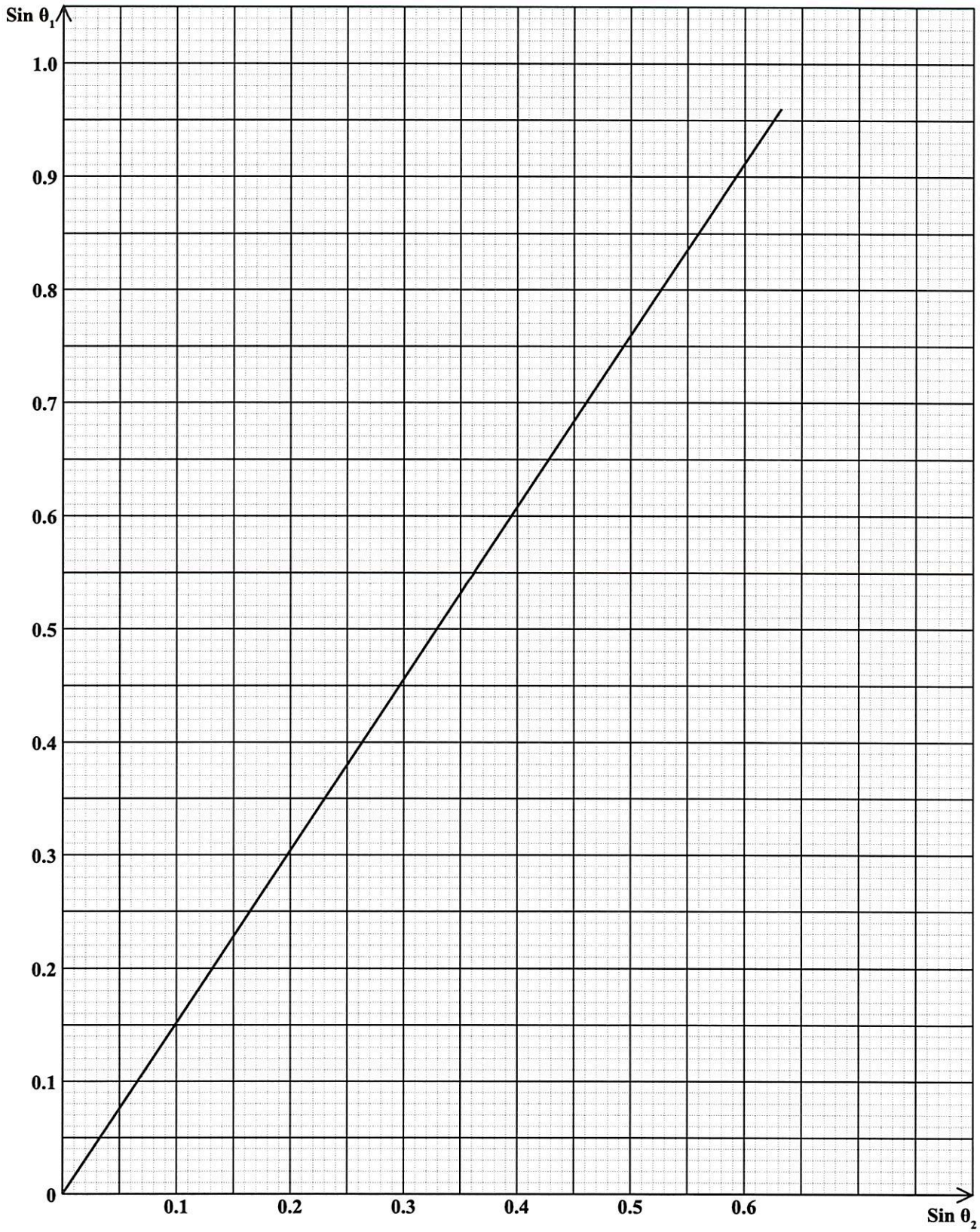

Figure 4. Graph $\sin\theta_1$ against $\sin\theta_2$

GO ON TO THE NEXT PAGE

(c) Calculate the gradient, n, of the graph.

(4 marks)

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(d) What physical quantity does the gradient, n, represent?

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(1 mark)

(e) The gradient is related to the speed of light, c_1, in air and the speed of light, c_2, in the glass such that $n = c_1/c_2$. Calculate the value of c_2, given that $c_1 = 3 \times 10^8$ m s^{-1}.

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(2 marks)

(f) State ONE necessary precaution that the student should have taken while conducting the experiment.

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(1 mark)

Total 17 marks

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NOTHING HAS BEEN OMITTED.

3. "Pressure at a point in a liquid varies with depth."

Plan and design an experiment to investigate the statement above. Your answer should include the following:

(a) Apparatus

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(2 marks)

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(b) Method

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(4 marks)

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(c) ONE 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

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Question No. ☐

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EXTRA SPACE

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Question No. ☐

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Question No. ☐

526

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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: | | | | | | | | | | |

526

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.

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

Signature: _____
Supervisor/Invigilator

Date: _____