## 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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# CARIBBEAN EXAMINATIONS COUNCIL

**CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION**

**05 JUNE 2014 (a.m.)**

M1401238032

**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 |

| HOW MANY ADDITIONAL PAGES HAVE YOU USED IN TOTAL? | |
|---|---|

SIGNATURE _____

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FORM TP 2014101

TEST CODE 01238032

MAY/JUNE 2014

CARIBBEAN EXAMINATIONS COUNCIL

# CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

## PHYSICS

**Paper 032 – General Proficiency**

**Alternative to SBA**

***2 hours 10 minutes***

**READ THE FOLLOWING INSTRUCTIONS CAREFULLY.**

1. You MUST use this answer booklet when responding to the questions. For each question, write your answer in the space provided and return the answer booklet at the end of the examination.
2. ALL WORKING MUST BE SHOWN in this booklet, since marks will be awarded for correct steps in calculations.
3. Do NOT write in the margins.
4. Answer ALL questions.
5. The use of silent, non-programmable calculators is permitted.
6. Mathematical tables are provided.
7. You are advised to take some time to read through the paper and plan your answers.
8. If you need to re-write any answer and there is not enough space to do so on the original page, you must request extra lined pages from the invigilator. **Remember to draw a line through your original answer and correctly number your new answer in the box provided**.
9. **If you use extra pages you MUST write your registration number and question number clearly in the boxes provided at the top of EVERY extra page.**

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

**Answer ALL questions.**

**You MUST write your answers in this answer booklet.**

**1.** A teacher did a demonstration to show that temperature remains constant during a phase change. She heated 20 g of ice at –10°C for 20 minutes and the students read the thermometers at different intervals. Some of their observations are shown in Figure 1 below

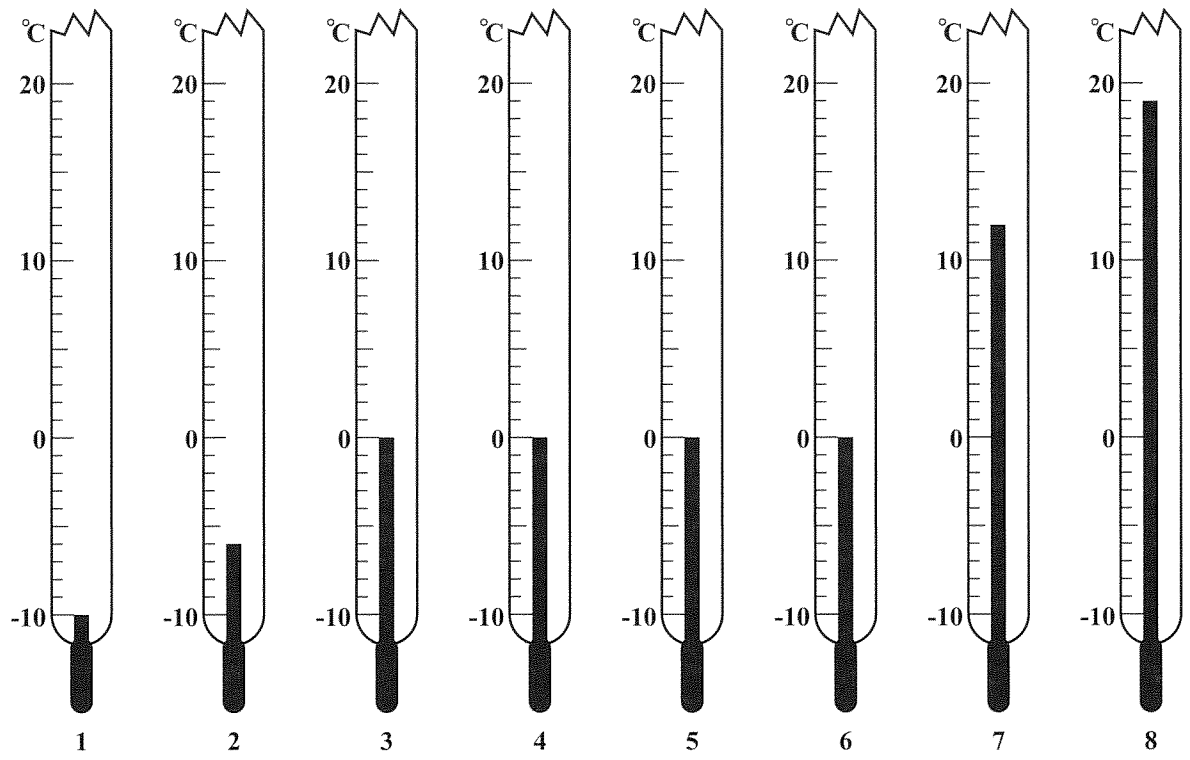


**Figure 1.**

(a) (i) Record the readings in Table 1 below.

**TABLE 1**

| **Intervals** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|---|---|---|
| **Temperature, θ/°C** | | | | | | | | |
| **Time, t/s** | 0.0 | 10.0 | 25.0 | 75.0 | 125.0 | 250.0 | 280.0 | 305.0 |

**(8 marks)**

(ii) Plot a graph, on page 3, of Temperature (θ/°C) versus Time (t/s). **(6 marks)**

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(b) How much time did the change of phase take?

**(2 marks)**

(c) How much heat is absorbed during the change of phase?

[Specific Latent Heat of Fusion of Ice = 336 000 $JKg^{-1}$ ]

**(4 marks)**

**Total 20 marks**

**2.** (a) In an experiment to investigate the refraction of light through a glass block, a student produced the result shown in Figure 2.

(i) Draw the path taken by the ray through the block.

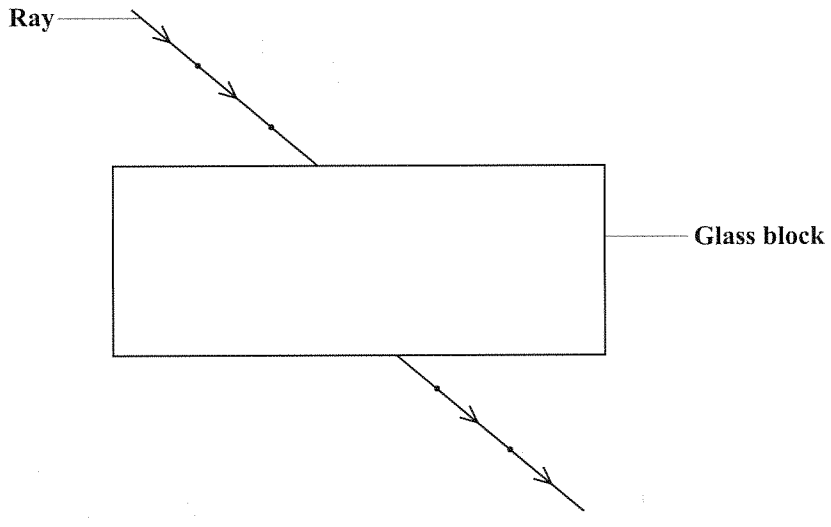


**Figure 2.**

**(1 mark)**

He plotted his results on a graph as shown on page 5.







(b) Procedure

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**(3 marks)**

(c) Use of Data to support/reject

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**(3 marks)**

**Total 9 marks**

**END OF TEST**

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

**3.** Sandy made the following statement: "The resistance of a metallic conductor at a constant temperature is constant as the potential difference across it varies".

Using the filament of a light bulb, investigate if this statement is true for a range from 1.0V to 2.8V.

Your response should include:

(a) **EITHER**

A list of all the apparatus used

**OR**

A well-labelled diagram

(b) A description of the procedure

(c) How the data gathered is used to support or reject Sandy's statement

**Write your answers to question 3 here.**

(a) Apparatus

.....

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.....

**OR**

Labelled diagram

**(3 marks)**

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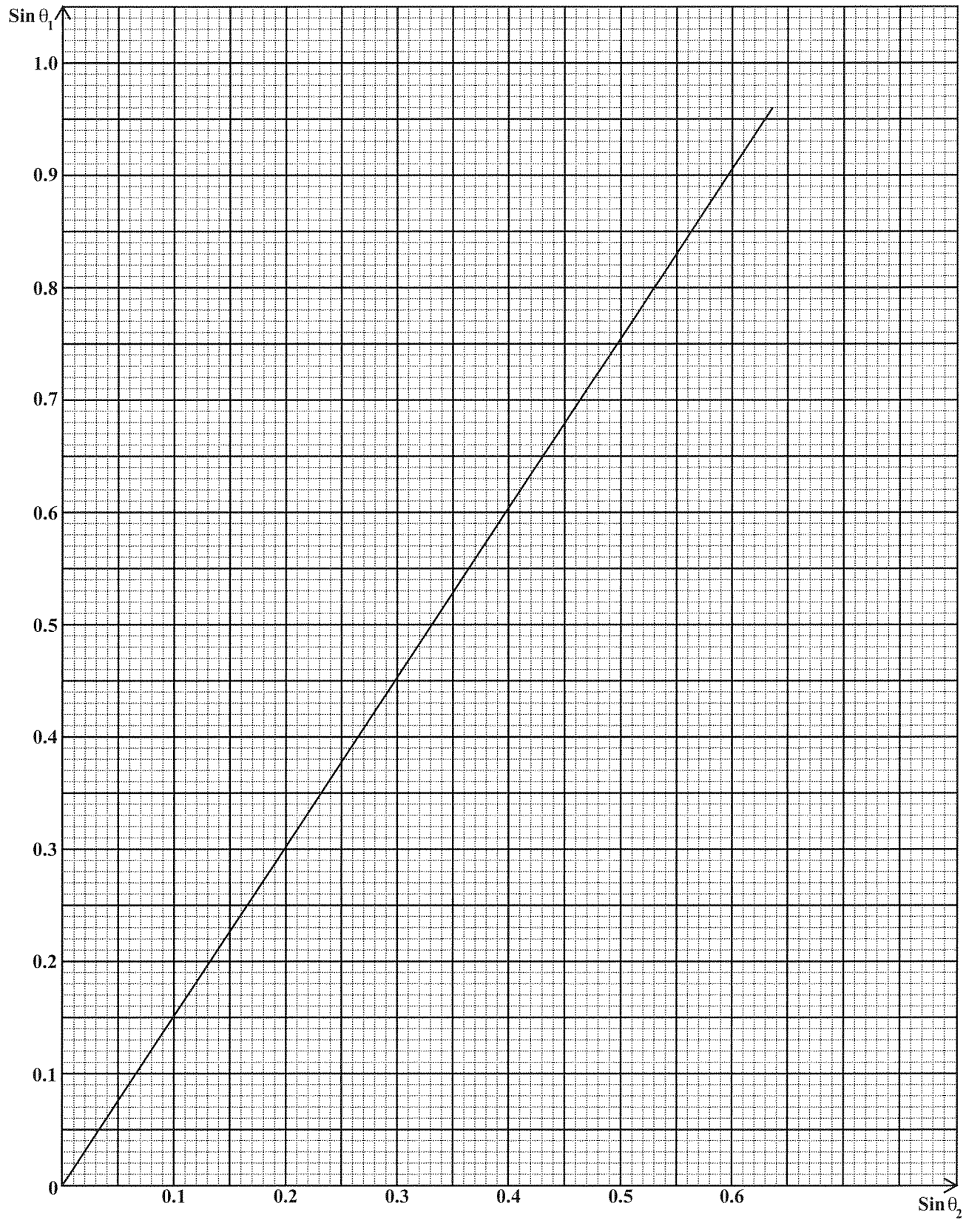


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(ii) Use the graph to complete the table below.

| | $\sin \theta_1$ | $\sin \theta_2$ |
|---|---|---|
| 1 | | 0.11 |
| 2 | | 0.23 |
| 3 | 0.50 | |
| 4 | | 0.43 |
| 5 | 0.77 | |
| 6 | 0.87 | |
| 7 | | |

**(8 marks)**

(iii) State TWO necessary precautions that the student should have taken in conducting the experiment.

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**(2 marks)**

(iv) Calculate the gradient, $n$, of the graph.

**(4 marks)**







(b) What physical quantity does the gradient represent?

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**(1 mark)**

(c) It is known that 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 $n = c_1 / c_2$.

If $c_1 = 3 \times 10^8$ m s$^{-1}$, find the value of $c_2$.

**(3 marks)**

**Total 19 marks**