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

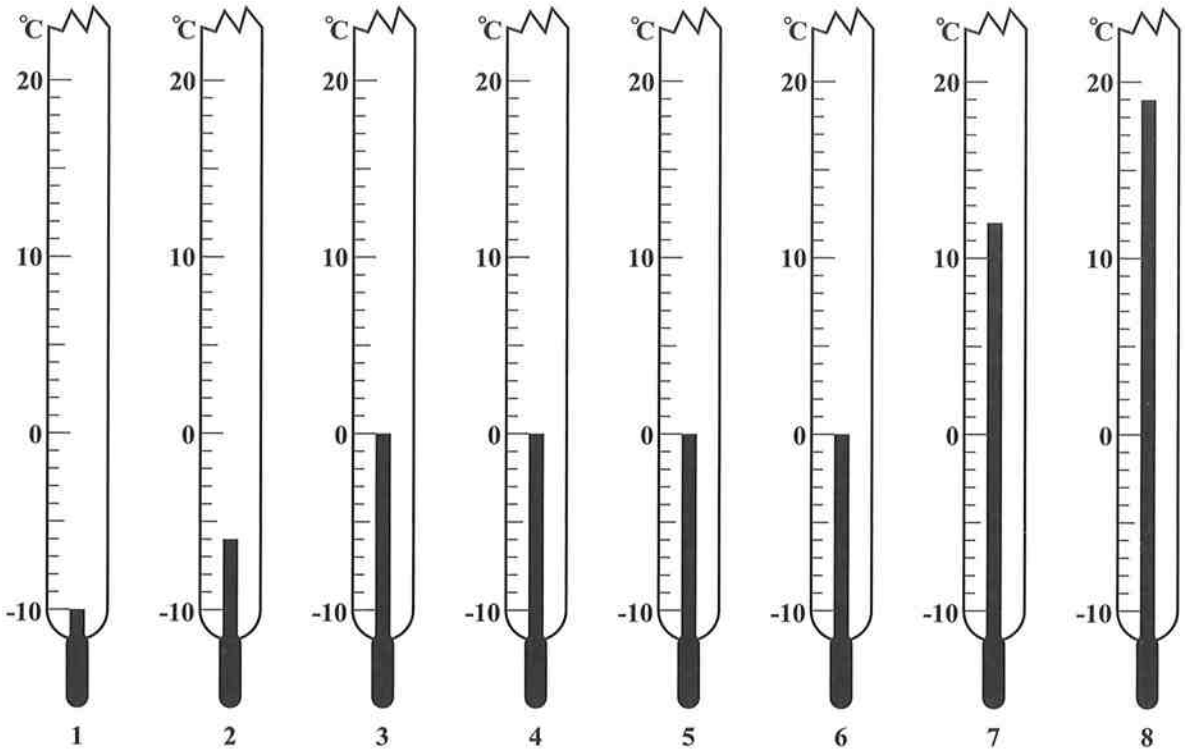


Figure 1.

(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)**

GO ON TO THE NEXT PAGE

(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.

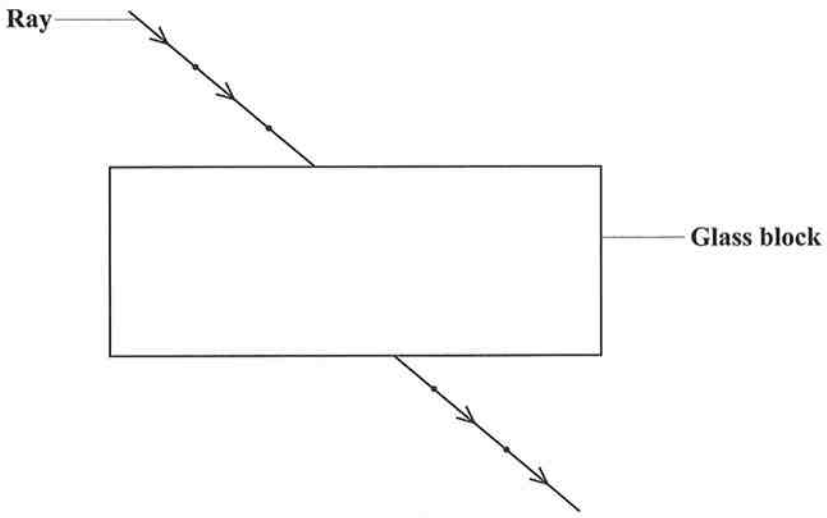
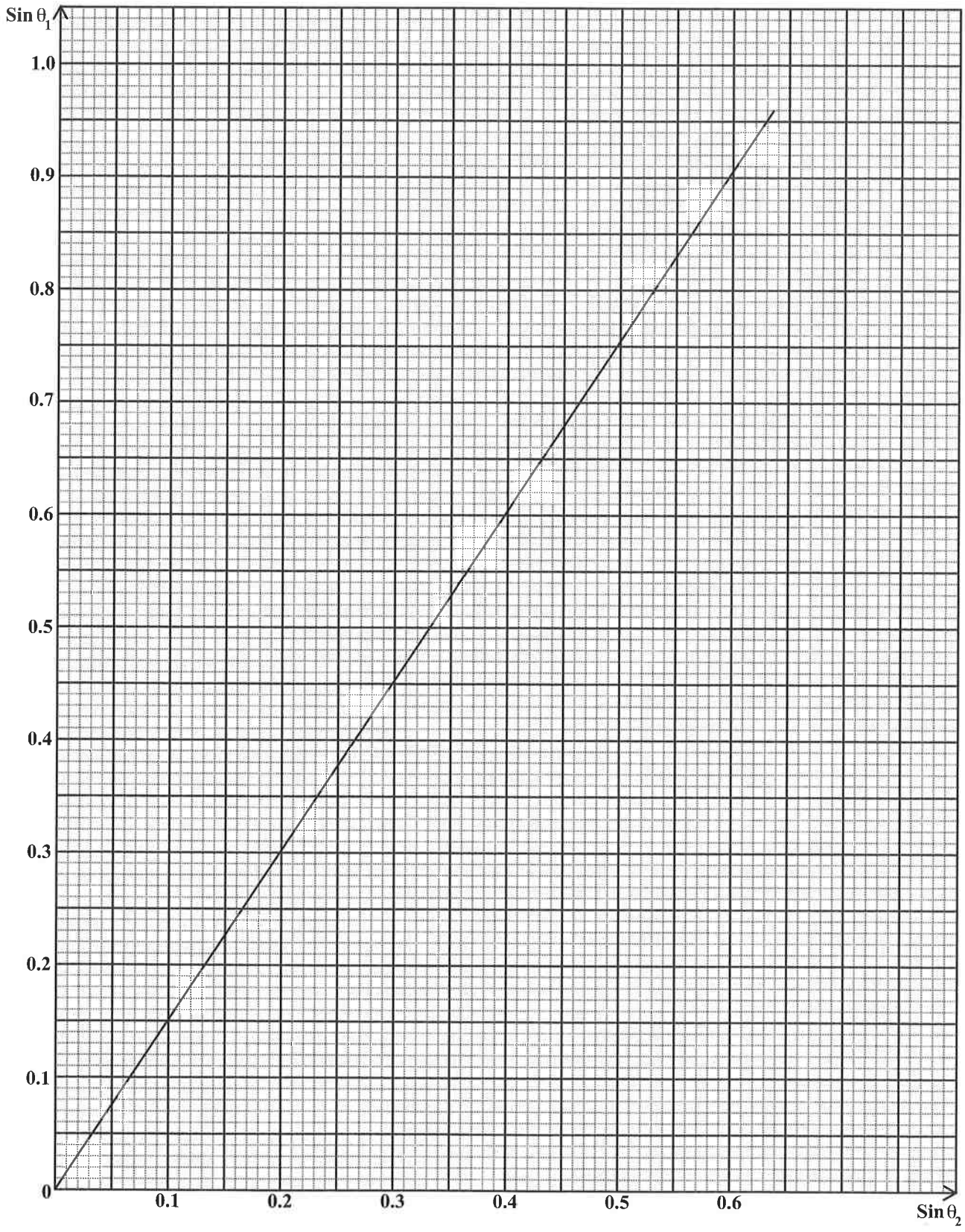


Figure 2.

(1 mark)

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



(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.

.....

.....

.....

.....

.....

.....

(2 marks)

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

(4 marks)

GO ON TO THE NEXT PAGE

(b) What physical quantity does the gradient represent?

.....

.....

(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

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

.....

.....

.....

.....

OR

Labelled diagram

(3 marks)

GO ON TO THE NEXT PAGE

(b) Procedure

.....

.....

.....

.....

.....

.....

(3 marks)

(c) Use of Data to support/reject

.....

.....

.....

.....

.....

.....

.....

(3 marks)

Total 9 marks

END OF TEST

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