

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION

17 JANUARY 2022 (p.m.)



FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE

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SUBJECT PHYSICS – Paper 032

PROFICIENCY GENERAL

REGISTRATION NUMBER

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SCHOOL/CENTRE NUMBER

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NAME OF SCHOOL/CENTRE

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

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DATE OF BIRTH

D	D	M	M	Y	Y	Y	Y
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SIGNATURE _____



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FORM TP 2022026



TEST CODE 01238032

JANUARY 2022

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION

PHYSICS

Paper 032 – General Proficiency

Alternative to School-Based Assessment

2 hours 10 minutes

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.**

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

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NOTHING HAS BEEN OMITTED.

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Answer ALL questions.

1. You are required to determine if the extension of a rubber band obeys Hooke's Law.

Apparatus and Materials

- Retort stand, boss and clamp
- Mass hanger plus 7 masses (100 g each)
- Metre rule
- A marked rubber band

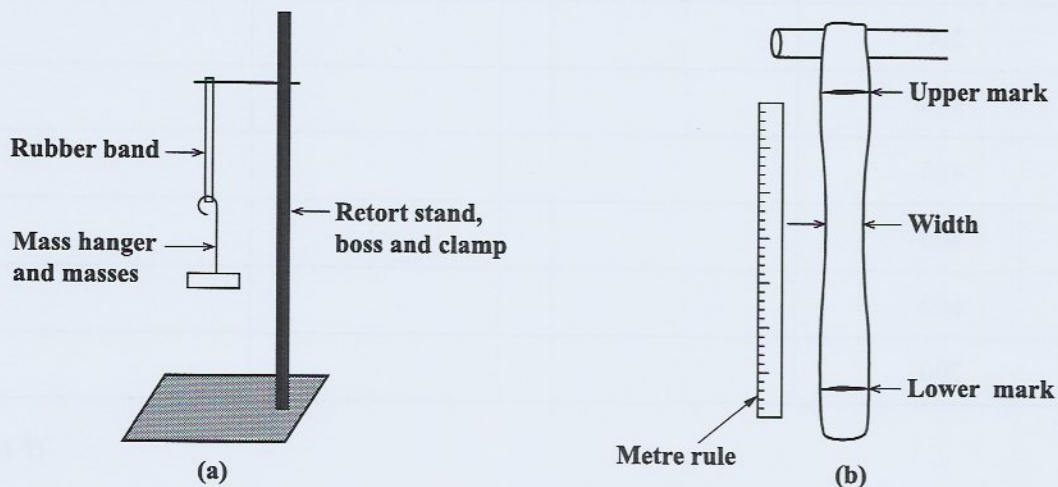


Figure 1. Setup of apparatus

Procedure

1. Hang the rubber band from the clamp as shown in Figure 1 (a) and attach the mass hanger to the lower end of the rubber band.
2. Measure the distance (S) between the two marks on the rubber band as shown in Figure 1 (b) and record this value in Table 1.
(N.B. This is the value of S when $m = 0$ and $F = 0$)
3. Gently, add a 100 g mass to the hanger and record the distance between the marks.
(N.B. Do not drop the mass onto the hanger.)
4. Repeat Step 3 by adding a 100 g mass each time, until the total mass is 700 g.
5. Calculate the stretching force (F) by using the equation $F = m \text{ (kg)} \times g \text{ (Nkg}^{-1}\text{)}$, where $g = 10 \text{ Nkg}^{-1}$. Record the value of F in Table 1.
6. Calculate the increase in length or the extension (x / cm) of the rubber band by subtracting the initial scale reading from each of the loaded readings. Record these values in Table 1 (in the extension of the rubber band column).

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(a) Complete Table 1.

TABLE 1: STRETCHING FORCE AND ASSOCIATED DISTANCE READING

Mass on massholder $m / (\text{g})$	Stretching force $F / (\text{N})$	Distance between upper and lower mark $S / (\text{cm})$	Extension of the rubber band $x / (\text{cm})$
0	0		0
100	1.0		
200			
300			
400			
500			
600			
700			

(5 marks)

(b) On the grid provided in Figure 2 on page 7, plot a graph of extension/(cm) versus stretching force/(N). Draw the best smooth curve through the points. (8 marks)

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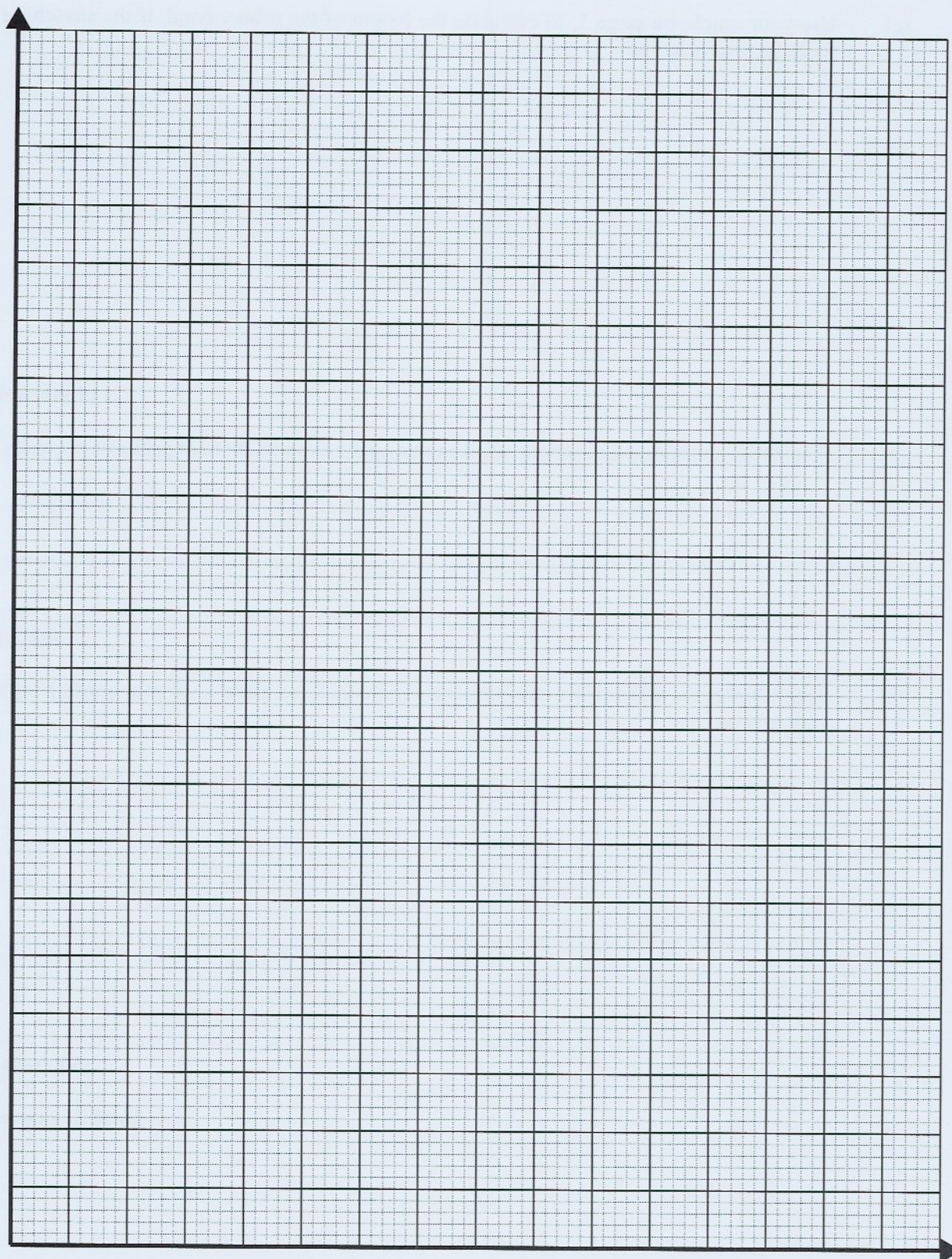


Figure 2. Graph of extension/(cm) versus stretching force/(N)

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- (c) Use your graph, on page 7, to calculate the length of the rubber band, if the stretching force applied is 3.5 N.

(4 marks)

- (d) State ONE precaution that should be taken during the experiment to improve its accuracy.

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(1 mark)

- (e) State whether the rubber band obeys Hooke's Law. Making reference to your graph, justify your answer.

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(3 marks)

Total 21 marks

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2. A student plotted the graph shown in Figure 3 of the results of an experiment to find the cooling curve of paraffin.

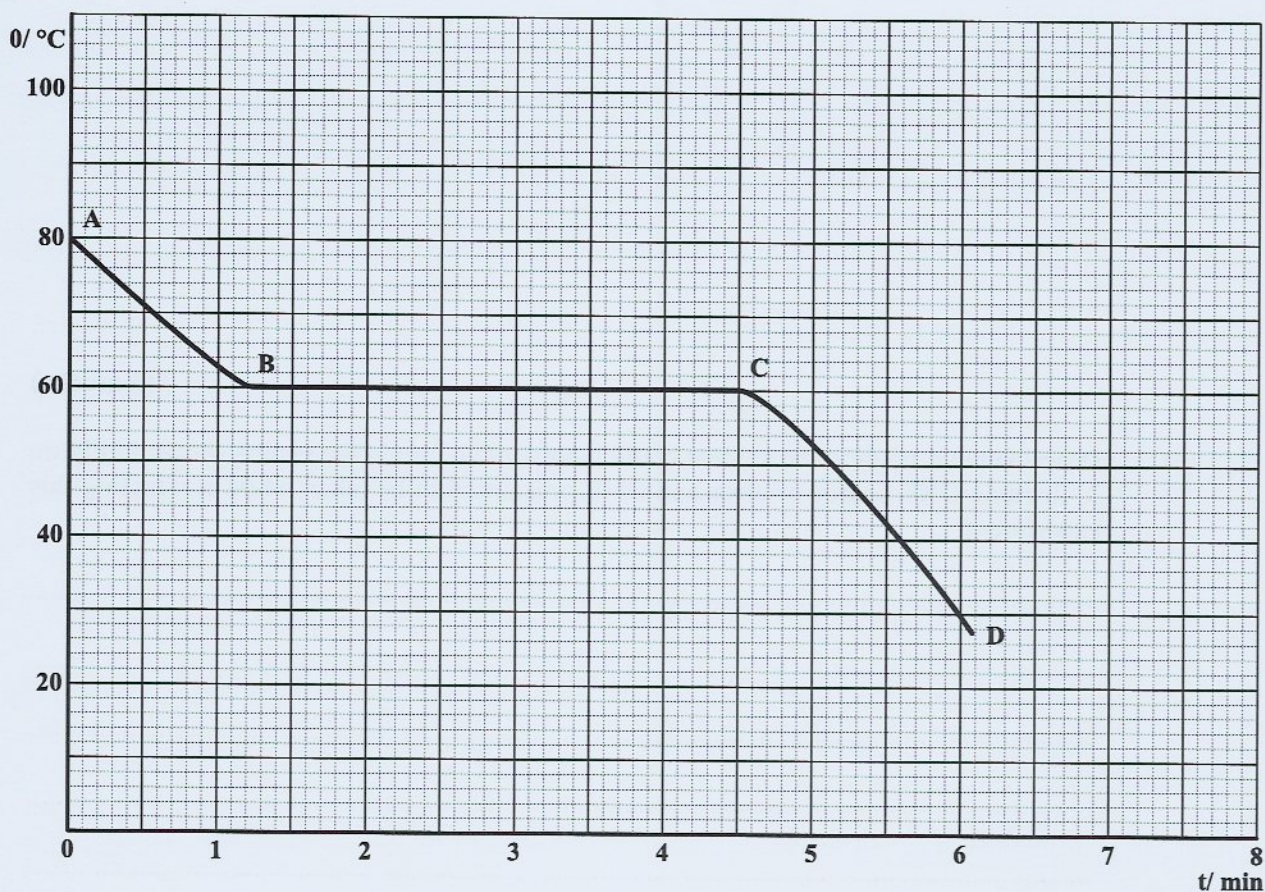


Figure 3. Cooling curve for paraffin

- (a) Complete Table 2 for values of θ and t using the graph shown in Figure 3.

TABLE 2: TEMPERATURE AND ASSOCIATED TIME READING

$\theta/^\circ\text{C}$				53		30
t/min	0.5	1.2	3		5.5	

(6 marks)

- (b) Which pair of letters, from the graph in Figure 3, indicates that the paraffin is in

(i) a solid state only

(ii) a liquid state only

(2 marks)

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(c) Analysis of Results

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.....
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(3 marks)

(d) ONE limitation

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.....
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(1 mark)

Total 10 marks

END OF TEST

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

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CANDIDATE'S RECEIPT

INSTRUCTIONS TO CANDIDATE:

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

TEST CODE:

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SUBJECT: PHYSICS – Paper 032

PROFICIENCY: GENERAL

REGISTRATION NUMBER:

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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: _____

