NAME_____ INDEX NO _____

KENYA HIGH SCHOOL
POST MOCK EXAMINATIONS
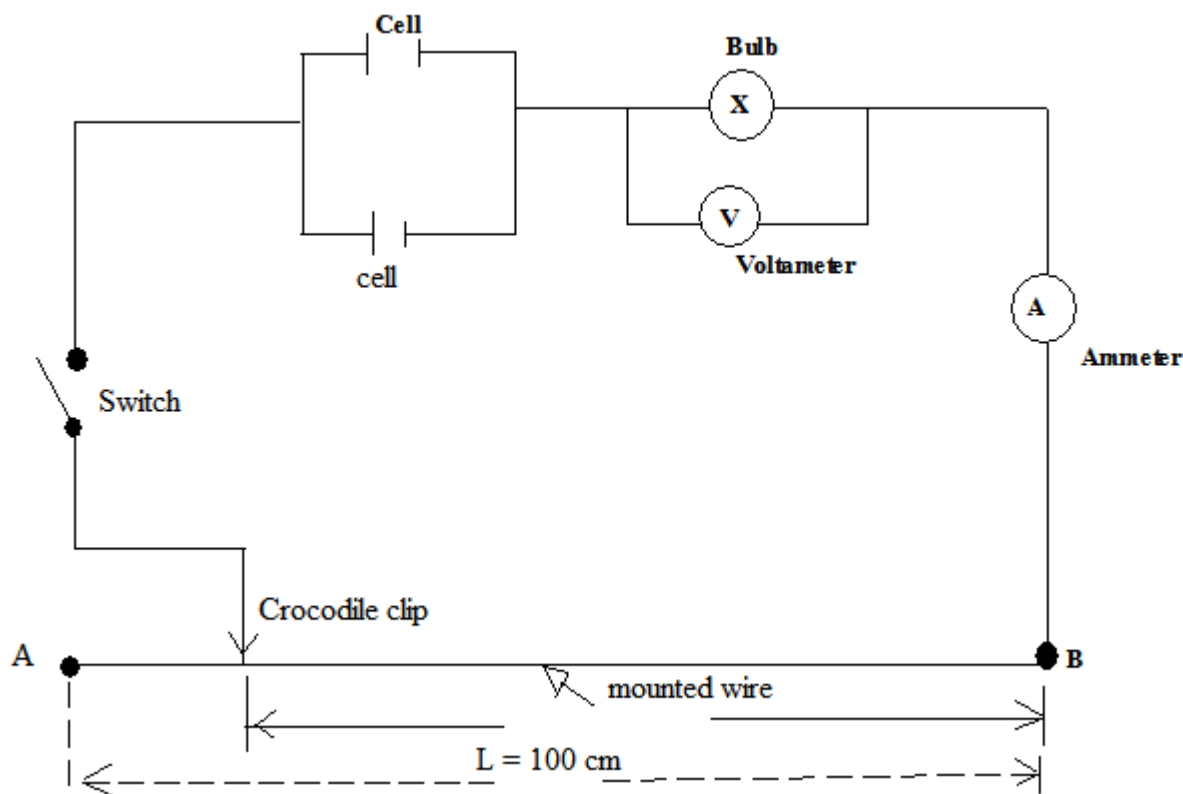## FORM 4
2021
Kenya Certificate of Secondary Education

Question 1
You are provided with the following apparatus
• Two dry cells
• A cell holder
• A bulb
• A voltameter
• An ammeter
• A switch
• Amounted resistance wire labelled AB

a) Set up the apparatus as shown in the circuit below.

b) With the crocodile clip at A (ie L = 100cm) take the voltameter reading (V) and the ammeter reading (I). Record V and I in the table below.

Length l(cm)	100	80	60	40	20	0
Voltage (V)						
Current I (A)						

(7 marks)

c) Repeat the procedure in (b) above for the lengths shown and complete the table above.

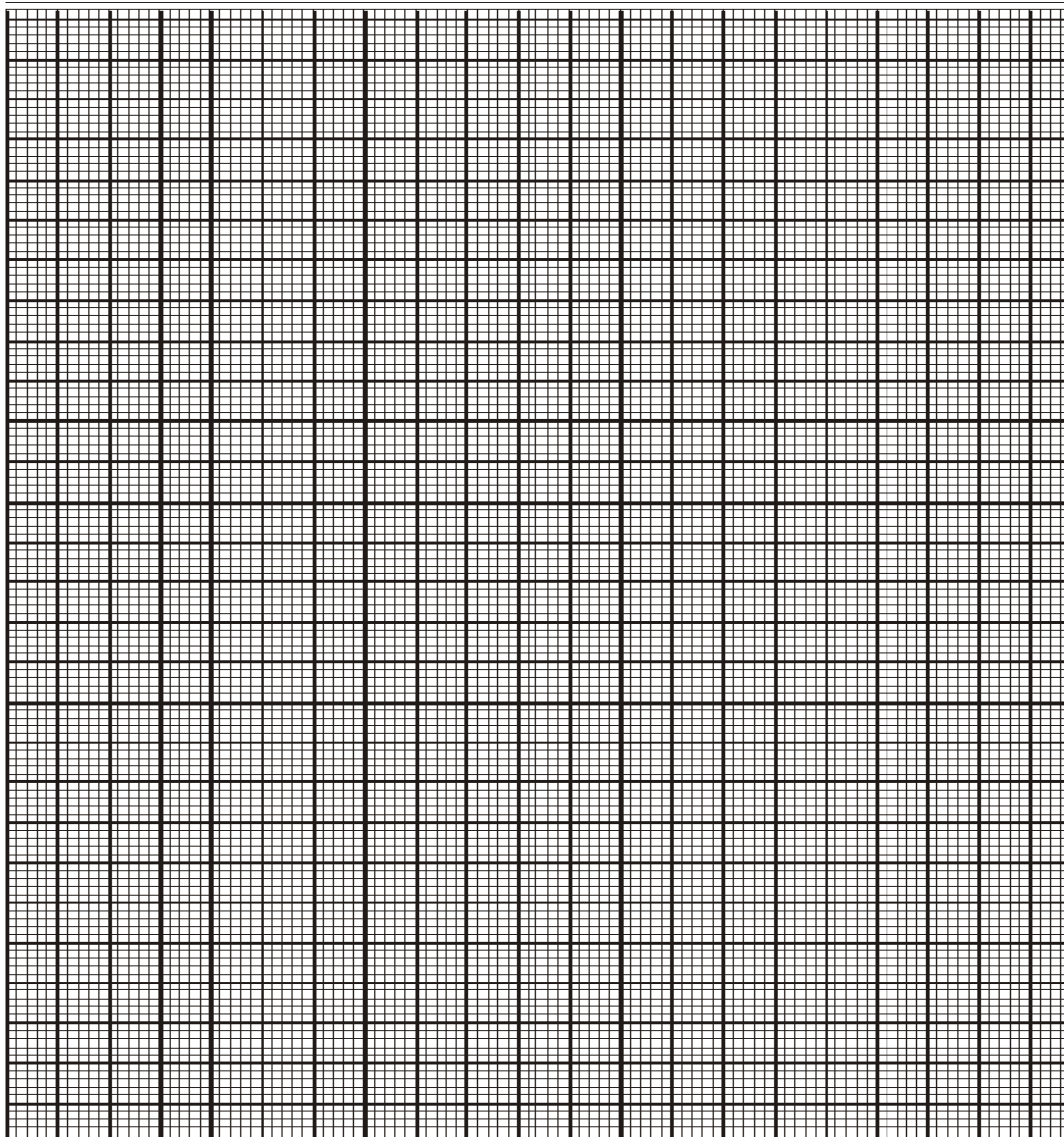d) State the changes you observe on the bulb as L decrease from A. (2 marks)

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………

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e) Plot a graph of voltage against length (cm) (5 marks)

f) What physical quantity does the slope of the graph represent at any given point. (2 marks)

g) From your graph determine the value of voltage at length L = 70cm. (2 marks)

h) Use your graph to describe how the physical quantity in (e) above is affected as the current increases. Explain why. (2 marks)

Question 2

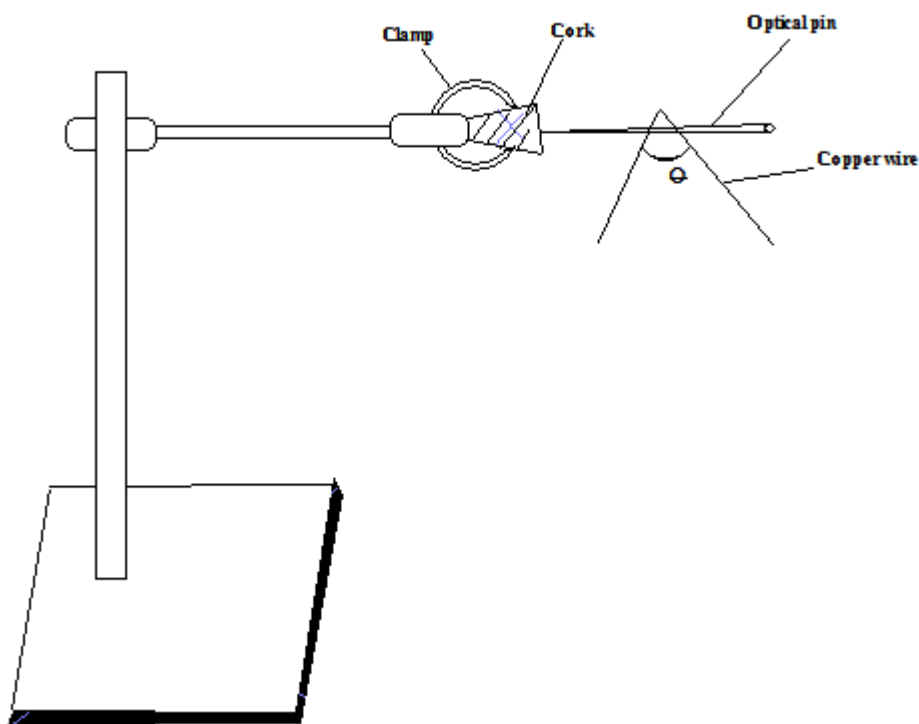You are provided with the following apparatus

- A complete stand
- Copper wire (wire length about 30cm)
- A stop watch
- A protractor
- A meter rule
- Corked optical pin

  Procedure

a) Measure the length L of the copper wire.

   L = ...   m   (1 mark)

b) Bend the wire to form an angle θ of 60^0, suspend it from the corked optical pin as shown in the diagram below.

c) Give it a small displacement so that it oscillates about a point on the pin. Measure the time, t(s) for 10 oscillations of the wire.

   t = ... (s)   (1 mark)

d) Repeat the procedure (b) above for the values of $\theta = 70^0, 80^0, 90^0, 100^0, 110^0$.

e) Record and complete the results in the table below.

θ (°)	60	70	80	90	100	110
Cos $\frac{1}{2}\theta$						
Time for 10 oscillations, t (s)						
Periodic time T (s)						
T^2 (s^2)						
$\frac{1}{T^2}$ (s^{-2})						

(7 marks)

f) On the grid provided, plot a graph of $\frac{1}{T^2}$ (s^2) against Cos$\frac{1}{2}\theta$. (5 marks)
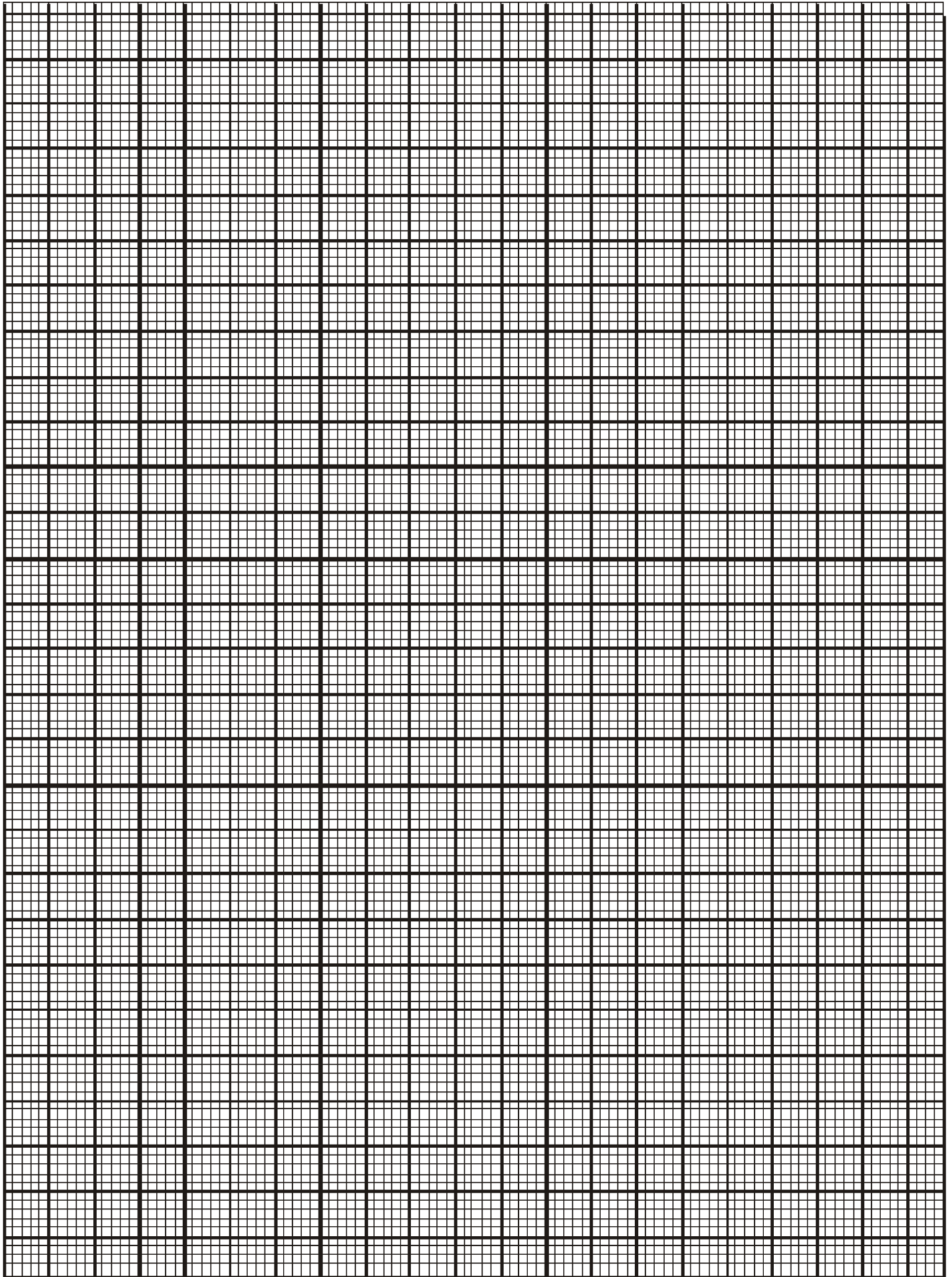
g) Determine the slope. (3 marks)

h) Given that the graph is related by the equation $^1/_T{}^2 = \frac{8\pi^2 L}{g} \cos{} ^1/_2\Theta$, determine the value of constant g. (3 marks)