

NAME Index No.

Class ADM. NO..... Date:.....

232/3

PHYSICS PRACTICAL

PAPER 3

TIME: 2½ hours

4MCK JOINT EXAMS – 2016

Instructions to candidates

1. Write your name, index number, class and admission number in the spaces provided.
2. Answer all questions on spaces provided
3. You are supposed to use the first 15 minutes of 2½ hours to check the apparatus carefully
4. Marks are given for correct, suitable and accurate observations
5. Record your observations as soon as you make them
6. Mathematical tables and silent electronic calculators may be used.

For Examiner's Use

QUESTION	MARKS	CANDIDATE'S SCORE
1	20	
2	20	

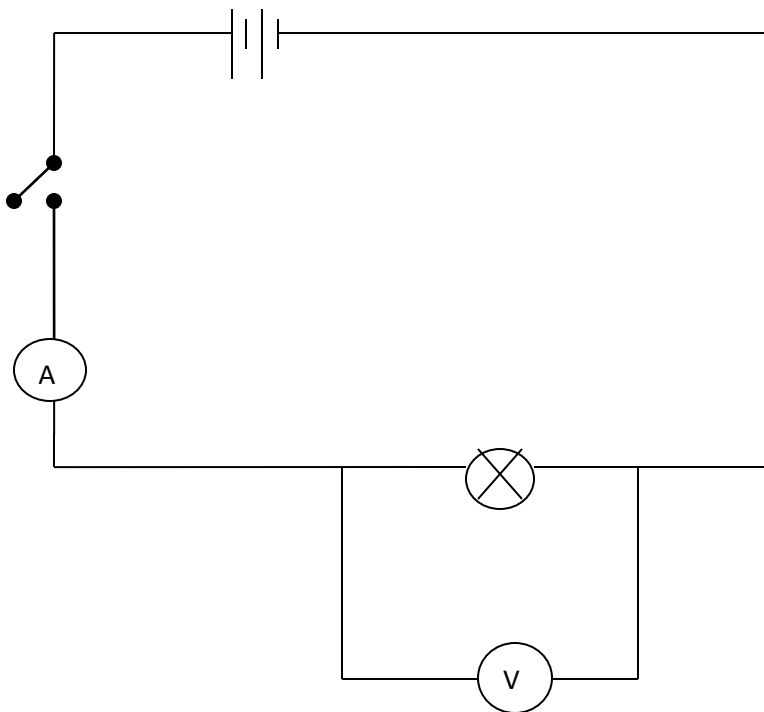
Q1. PART A

You are provided with the following

- A voltmeter
- An Ammeter
- Six connecting wires
- A cell holder
- A torch bulb
- Two new dry cells
- A switch

Proceed as follows

- a) i) Connect the apparatus provided as shown in figure below.



- ii) Close the switch and record the ammeter and voltmeter readings.

I = _____

(1 mark)

V = _____

(1 mark)

- iii) Using the relation $KI = V$, calculate K for the bulb stating its units.

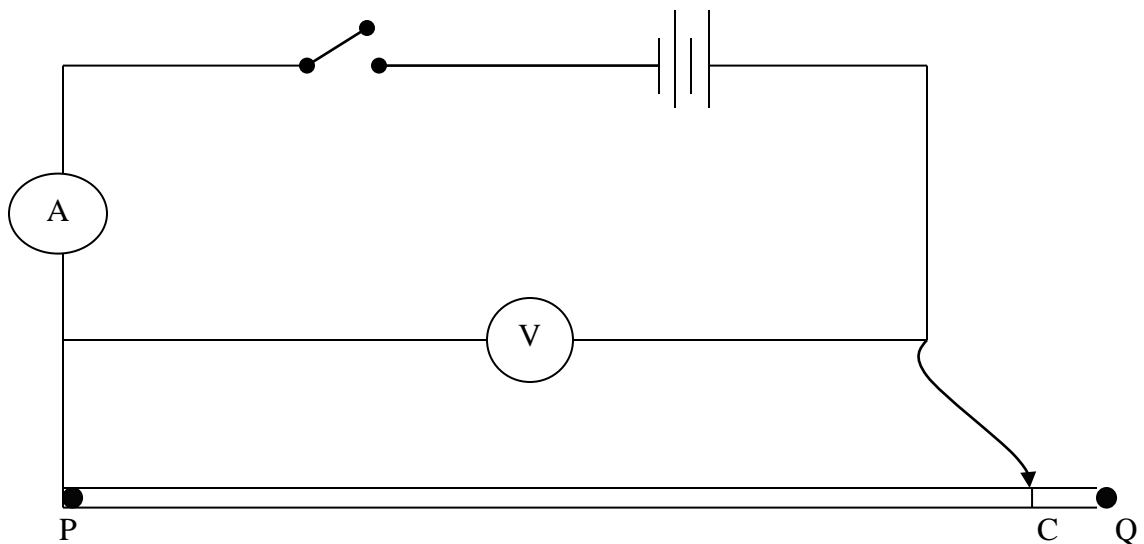
(2 marks)

PART B

You are provided with the following

- Two dry cells
- A voltmeter
- An ammeter
- A wire mounted on a mm scale (1m long)
- A switch

a)i) Connect the circuit as shown in figure below



N.B- The switch should be open when no readings are being taken.

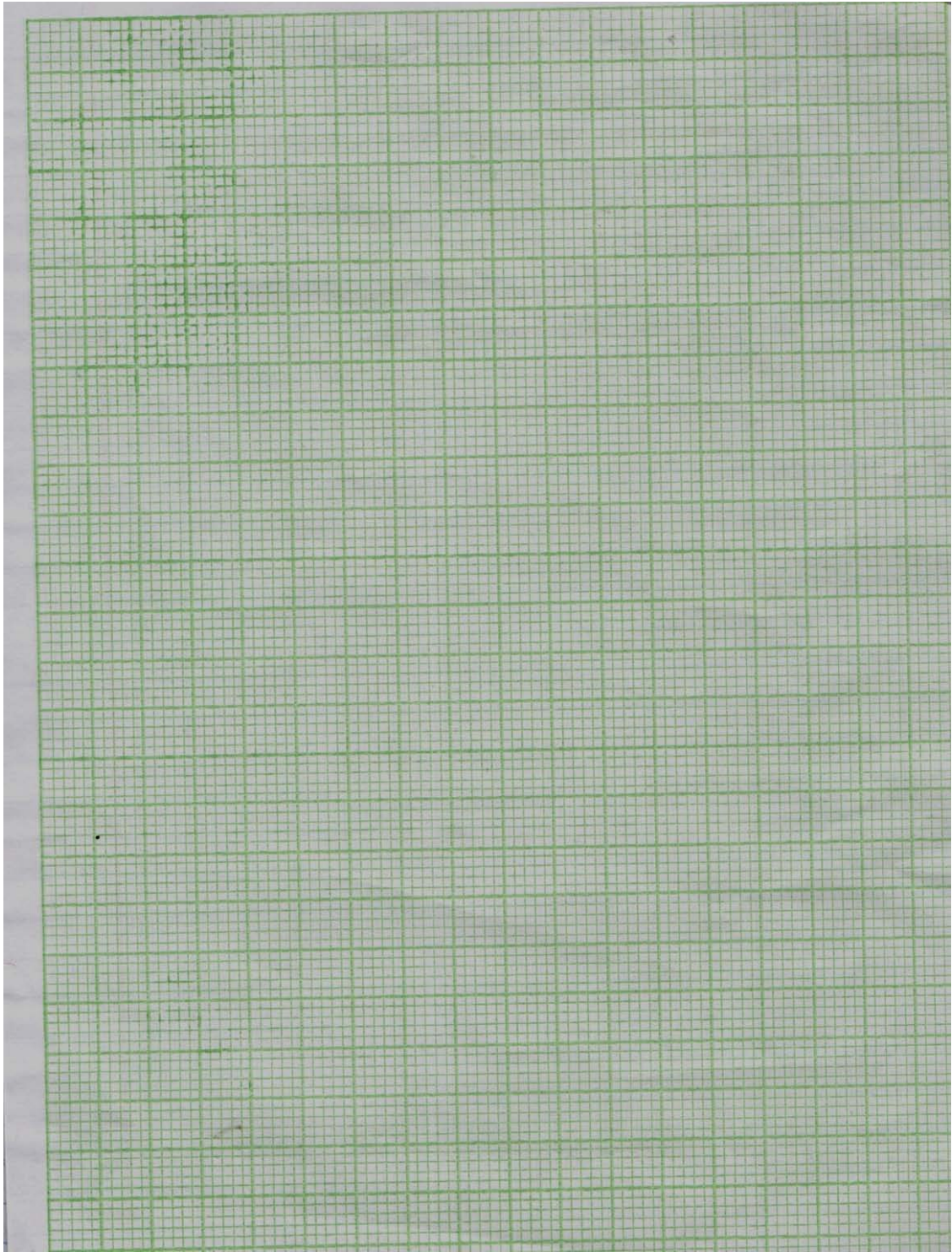
ii) Adjust the length of the nichrome wire PQ to PC = 75cm, using the crocodile clip at C. Close the switch and record the voltmeter and ammeter readings in table below.

iii) Repeat (a)(ii) for length PC equal to 65cm,55cm,45cm,35cm, and 25cm. (4 marks)

Length PC (cm)	75	65	55	45	35	25
p.d.(v)						
Current I (A)						

b)i) On the grid provided, plot a graph of I against V.

(5 marks)



ii) Determine the slope of your graph.

(3 marks)

iii) If the equation relating I and V is

$$I = \frac{1.2}{R}V + \log P$$

Use your graph to determine the value of

R = _____ (2 marks)

P = _____ (2 marks)

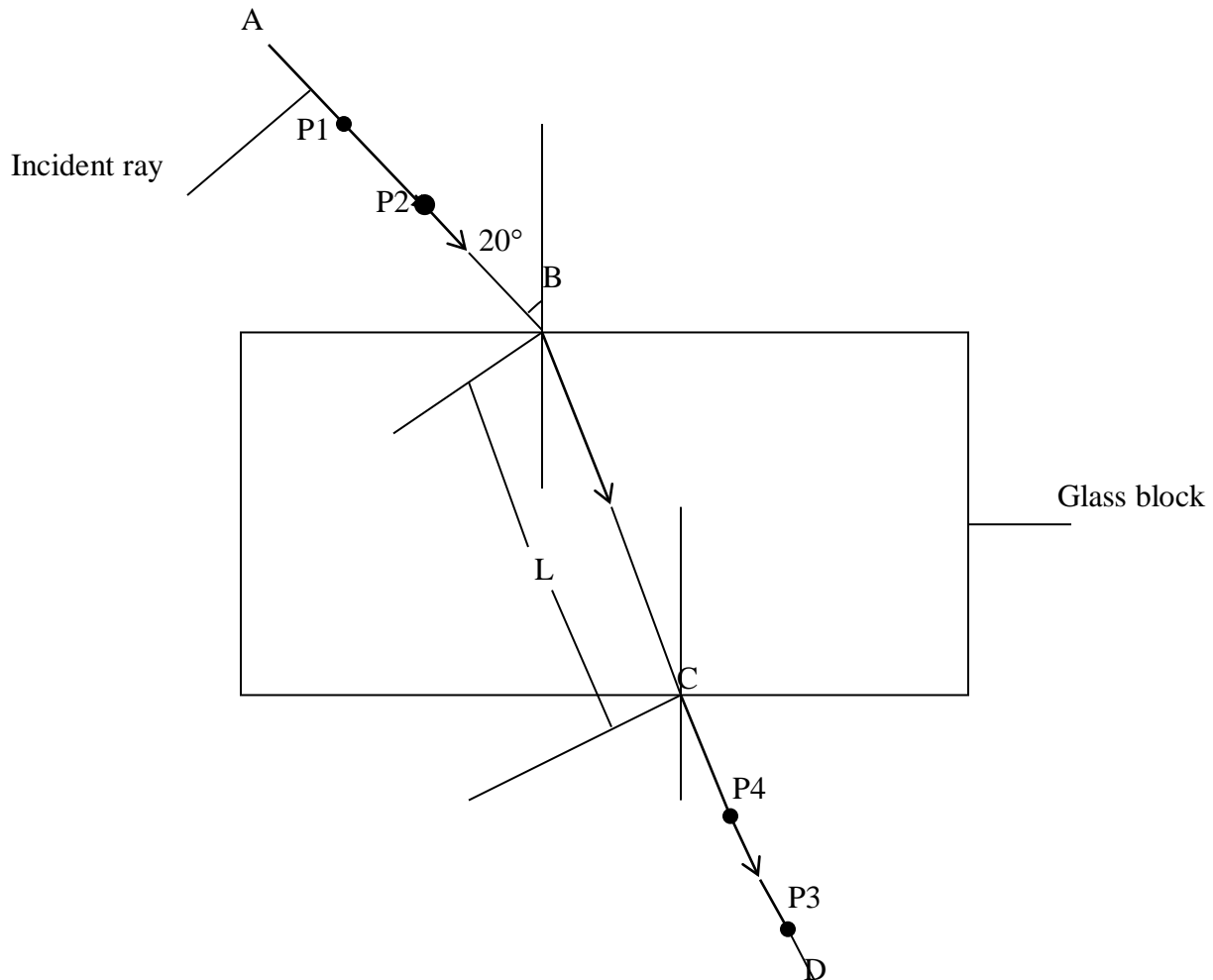
Q2. PART A

You are provided with the following

- A rectangular glass block
- Four optical pins
- A soft board
- A plane paper A4

Proceed as follows

- a) Place the glass block on the plane paper with one of the largest faces upper most. Trace round the glass block using a sharp pencil as shown below



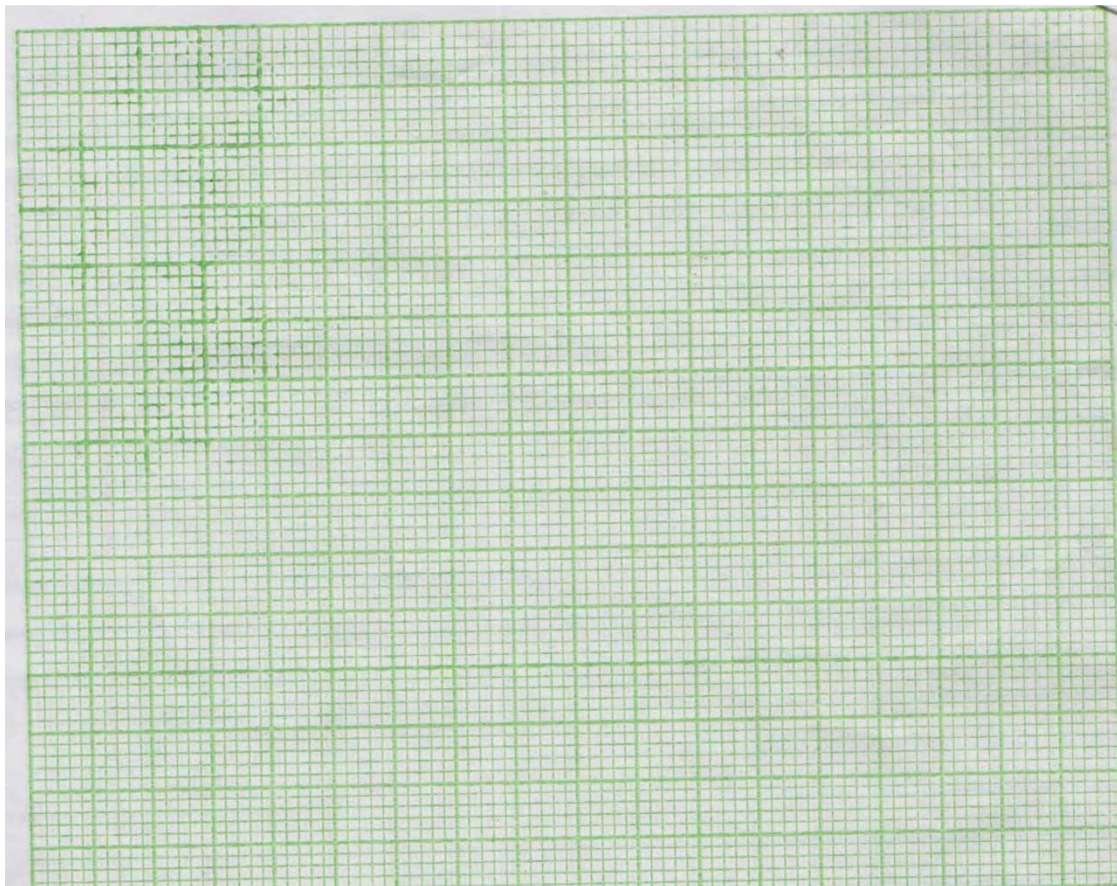
- b) Remove the glass block and construct a normal at B. Construct an incident ray AB of angle of incident equal to 20° .
- c) Replace the glass block and trace the ray ABCD using optical pin P3 and P4.
- d) Remove the glass block and draw the path of ray ABDC using a pencil, measure the length $L = BC$ and record its value in the table below.
- e) Repeat the procedure above for the angles of incident given in the table below and fill the rest of the table as required.

(6 marks)

Angle of incident (i)	L (cm)	$L^2(\text{cm}^2)$	$1/L^2 (\text{cm}^{-2})$	$\text{Sin}^2(i)$
20°				
30°				
40°				
50°				
60°				
70°				

- f) Plot a graph of $\text{sin}^2(i)$ (y-axis) against $1/L^2$

(5 marks)



g) Calculate the gradient, m , of the graph

(3 marks)

h) i) Measure the width, b , of the glass

$b =$ _____

(1 mark)

ii) Calculate the value of $\frac{M}{b}$

(1 mark)

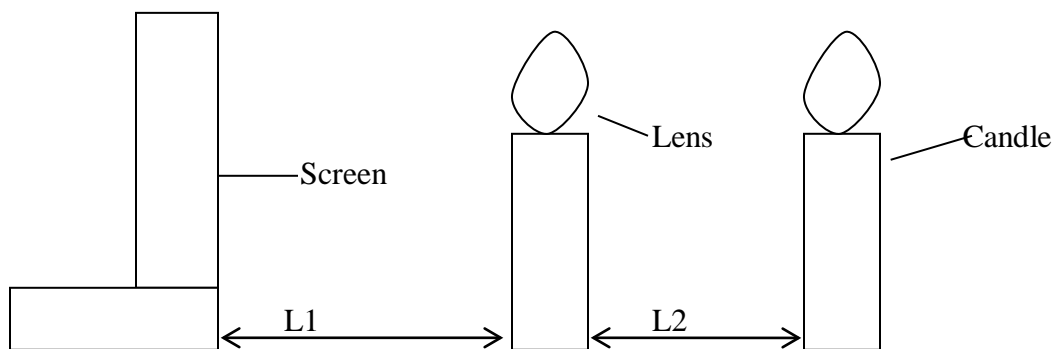
PART B

a) You are provided with the following:

- Meter rule
- White screen
- A candle
- Lens and lens holder

Proceed as follows

i) Set up the experiment as shown



ii) Starting with $L_1 = 30\text{cm}$, adjust the position of the candle in order to obtain a sharp image on screen and record the value of L_2 .

$L_2 = \underline{\hspace{2cm}}$ cm (1 mark)

iii) Repeat the procedure for $L_1 = 60\text{cm}$

iv) Fill and complete for the values of $\frac{L_1}{L_2}$ below

(2 marks)

L_1 (cm)	L_2 (cm)	$\frac{L_1}{L_2}$
30		
60		

v) Given that $F_1 = \frac{L_1}{m+1}$, where m – magnification, determine the value of focal length, F .

(2marks)