



# NORTHERN EDUCATION DIVISION

## 2024 MSCE MOCK EXAMINATIONS

### PHYSICS

Subject Number: M164/II

Monday, 18<sup>th</sup> March, 2024

Time Allowed: 2-hour sessions  
10:00 onwards

### PAPER II

#### Practical

(100 Marks) Instructions

1. This paper contains 6 printed pages. Please check.
2. Write your Name at the top of the question paper and on all other sheets.
3. Answer **all** the **thirteen** questions in the spaces provided.
4. Use of electronic calculators is allowed.
5. Maximum number of marks for each answer is indicated against each question.
6. In the table provided on this page, **tick** against the question number you have answered.
7. At the end of the examination, hand in your paper to the invigilator when time is called to stop writing.

#### Section A (20 Marks)

Answer **all** the question in this section.

1. With the aid of a well labelled diagram, describe an experiment that can be done to verify Charles law.

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Student Name: \_\_\_\_\_

(10 marks)

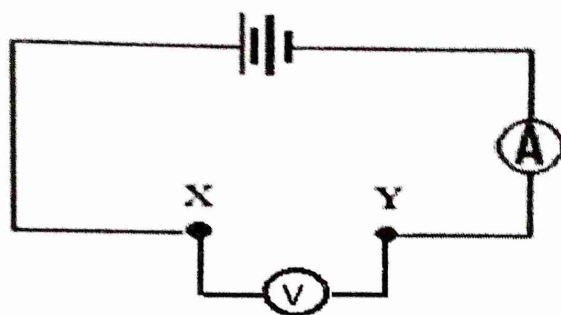
2. Describe an experiment that can be done to show that the sum of clockwise moments about a point is equal to the sum of anticlockwise moments about the same point.

(10 marks)

**Section B (20 Marks)**

You are provided with 2 cells, a cell holder, an ammeter, voltmeter, 5 connecting wires and nichrome wire with different number of strands.

- a. Set up the experiment as shown in figure 2 below



- b. Connect one strand of nichrome wire on the gap xy  
 c. Note and record the ammeter reading and voltmeter reading in the table of results below  
 d. Remove the nichrome wire from the gap  
 e. Repeat steps (b) to (d) using nichrome wires with two, three, four and five strands.  
 f. Calculate ratio of voltage to current and record in the table

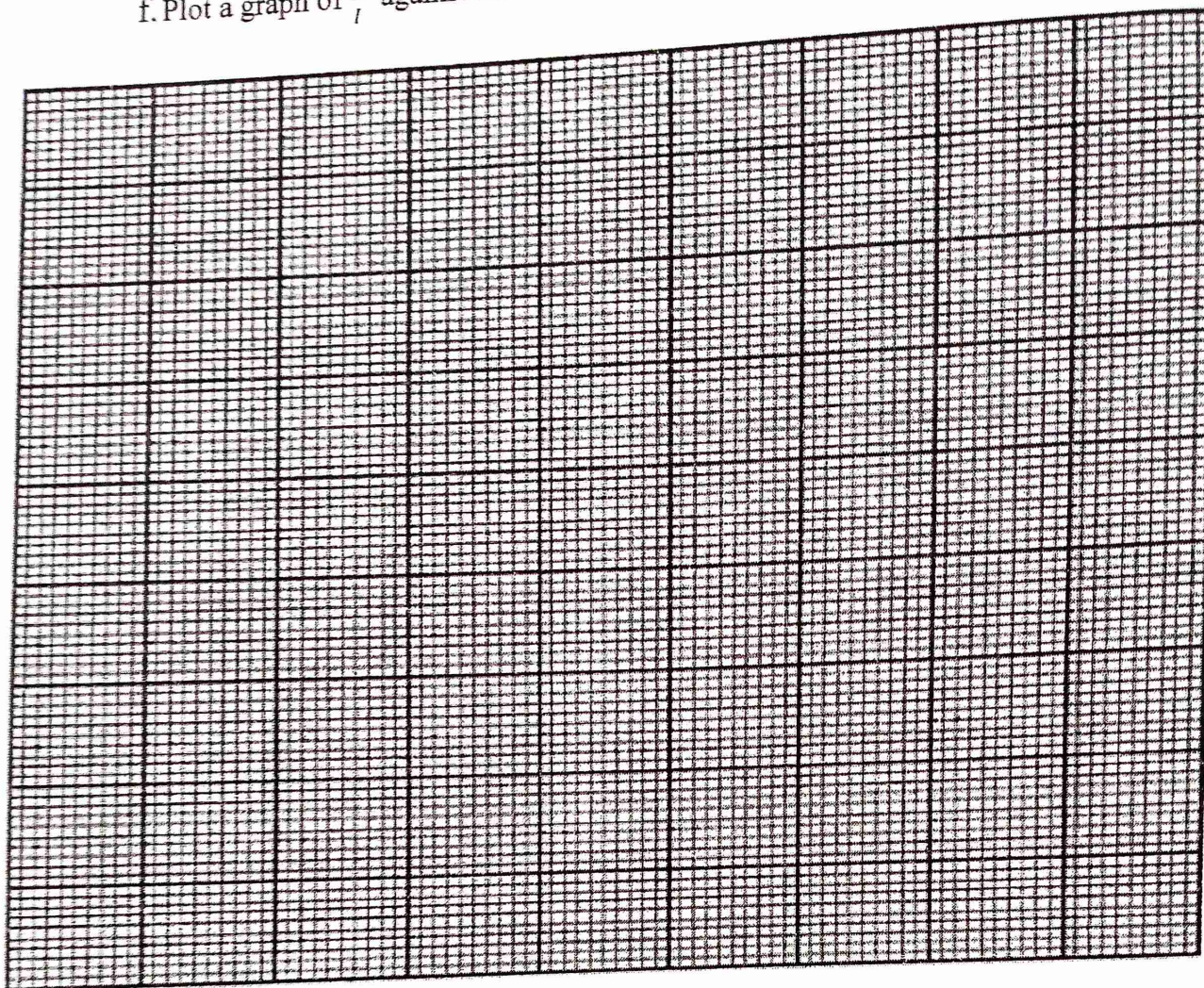
**Table of results**

Number of strands (N)	Current (A)	Voltage(V)	$\frac{V}{I}$
1			
2			
3			
4			

(4 marks)



f. Plot a graph of  $\frac{V}{I}$  against number of strands



(5 marks)

g. From the graph determine the relationship between  $\frac{V}{I}$  and number of strands.

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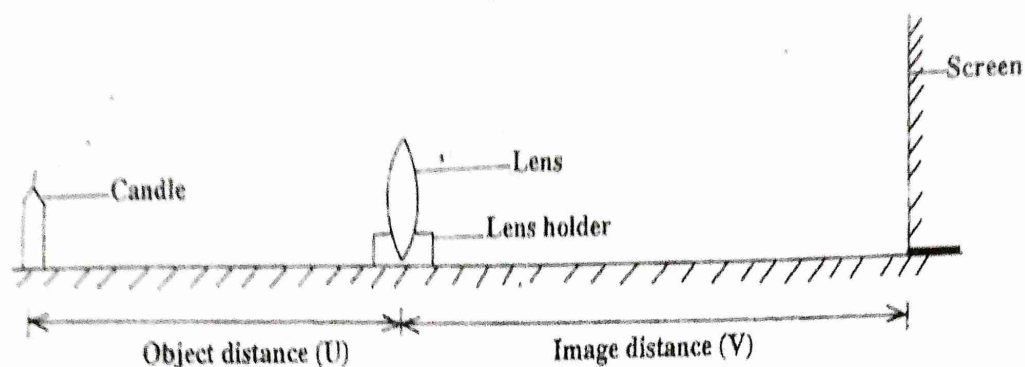
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(1 mark)

4. You are provided with a candle, matches, a lens, a lens holder, a meter ruler and a screen.

a. Arrange the apparatus as shown in the figure below.





- b. Light the candle
- c. Move the candle (object) until it is 15cm from the screen.
- d. Move the screen until a clear image is formed on the screen.
- e. Measure the image distance,  $V$  and record it in the table of results.
- f. Repeat steps c to e for object distances shown in the table below.
- g. Complete the  $(U+V)$  column of the table below.

Table of results

Object distance, $U$ (cm)	Image distance, $V$ (cm)	$U+V$ (cm)
15		
18		
20		
25		
30		

(5 marks)

- h. Plot a graph of  $(U+V)$  against  $U$ .

