**Name………………………………………………………. Index No…………………/…….**

**School……………………………………………………… Date ………………………….…**

**Candidate’s Signature………………………**

232/3

**PHYSICS**

Paper 3

(PRACTICAL)

**Time: 2 ½ Hours**

## INSTRUCTIONS TO CANDIDATES

1. Write your name and Index Number in the spaces provided above.

2. Sign and write the date of examination in the spaces provided above

3. Answer all the questions in the spaces provided in the question paper.

4. You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the

whole paper carefully before commencing your work.

5. Marks are given for a clear record of the observations actually made, their suitability, accuracy

and the use made of them.

6. Candidates are advised to record their observations as soon as they are made.

7. Non-programmable silent electronic calculators and KNEC mathematical tables may be used.

**QUESTION I**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PART A | II | IV | V | VI**TOTAL** |
| MAXIMUM SCORE | 1 | 1 | 1 | 2 |
| CANDIDATES SCORE |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PART B | II | III | IV | V**TOTAL** |
| MAXIMUM SCORE | 5 | 5 | 3 | 2 |
| CANDIDATES SCORE |  |  |  |  |

**QUESTION 2**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PART C | a | g | h(i) | h(ii) | i |
| MAXIMUM SCORE | 2 | 6 | 5 | 3 | 4**TOTAL** |
| CANDIDATES SCORE |  |  |  |  |  |

**GRAND TOTAL**

***This paper consists of 8 printed pages.***

***Candidates should check the question paper to ensure that all***

 ***pages are printed as indicated and no questions are missing***

**Question 1**

You are provided with the following:

- a metre rule

- a lens (Convex) mounted on a lens holder

- a candle

- a white screen

**Proceed as follows**

**Part A**

**i**) Set up the apparatus as shown in figure 1 below. (Ensure that the burning candle and the lens are in a straight line)



ii) With the candle placed at a distance L = 100cm from the screen, determine the position of

a sharply focused magnified image of the candle on the screen by moving the lens towards

the screen.

 iii) Measure the distance U1 between the lens and the candle

 U1 = ……………………………… cm. (1mk)

 iv) Now move the lens towards the screen until you get a sharply focused diminished image.

 Measure the new distance, U2 between the lens and the candle.

 U2 = ………………………………cm (1mk)

 v) Calculate the displacement d of the lens given that d = U2 – U1

 d = ……………………………..

 …………………………………cm (1mk)

 vi) Given that ![](data:application/x-msmetafile;base64...), calculate the value of f. (2mks)

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**Part B**

 i) With the same set up, ensuring that L = 100cm, adjust the lens until you get a sharp

diminished image on the screen. Measure the object distance U and the image distance V.



 ii) Repeat the procedure in (i) with L = 95cm, 90cm, 85cm and 80cm each time recording the

values of U and V and tabulating the results in the table I below.

 **Table I**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| L (cm) | 100 | 95 | 90 | 85 | 80 |
| U (cm) |  |  |  |  |  |
| V (cm) |  |  |  |  |  |
|  |  |  |  |  |  |

 (5mks)

 iii) Plot the graph of M against V (5mks)

![](data:application/x-msmetafile;base64...)

 iv) Determine the slope of the graph (3mks)

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 v) Given that V = fm + f, determine the focal length, f of the lens from the graph above

 (2mks)

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**Question 2**

You are provided with the following

 A measuring cylinder

 Glycerine

 Two rubber bands

 One metre ruler

 Steel ball bearing

 A magnet

 A micrometer screw gauge

 A stop watch

**Proceed as follows.**

a) Measure the diameter D of the steel ball using the micrometer screw gauge.

 D = ……………………………….mm (1mk)

 D = ……………………………….m (1mk)

b) Take a measuring cylinder and fill it with glycerine. Fix the bands A and B such that band A is

 3cm from the surface of glycerine as shown in the fig. 2 below.



c) Adjust the lower rubber band B so that h = 35cm.

d) Release the steel ball from the surface of the liquid and obtain the time, t it takes to travel the

distance h = 35cm. Record this value in the table 2 shown below.

e) Use the magnet provided to remove the steel ball from the liquid,

f) Repeat procedures (b), (c) and (d) for values of h given in the table below.

g) Record the values in the table below.

 **Table 2**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| h (cm) | 35 | 30 | 25 | 20 | 15 | 10 |
| t(s) |  |  |  |  |  |  |

h) i) Plot the graph of t (vertical axis) against h. (5mks)

![](data:application/x-msmetafile;base64...)

 ii) Determine the slope S of your graph (3mks)

 ………………………………………………………………………………………………

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i) The equation of the graph is given by

 ![](data:application/x-msmetafile;base64...)

 Determine the value of K given that (4mks)

 g = 10m/s2

 a = 7.0 x 103kg/m3

 b = 1.26 x 103kg/m3

 ………………………………………………………………………………………………

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 ………………………………………………………………………………………………

 ………………………………………………………………………………………………

 ………………………………………………………………………………………………

End