

LUWERO DISTRICT

S4 Physics 535/3 Marking Guide 2013

1. To determine the density of the material of the masses provided

⇒ Recording the initial position of the pointer with no mass on the spring

⇒ Drawing a table of results of 6 columns with all the values of m entered with unit

$m(\text{g})$	$P_1(\text{cm})$	$P_2(\text{cm})$	$e_1(\text{cm})$	$e_2(\text{cm})$	$(e_1 - e_2)(\text{cm})$
100					
200					
300					
400					
500					

⇒ Labeling of the rest of the columns correctly with unit

⇒ Recording 5 values of P_1 to 1 decimal place in cm

⇒ Recording 5 values of P_2 to 1 decimal places in cm

⇒ Correct calculation of e_1 to 1 decimal place with the values increasing

⇒ Correct calculation of e_2 to 1 decimal place with the values increasing

⇒ Correct calculation of the values of $(e_1 - e_2)$ to 1 decimal place in cm

⇒ Title of the graph: A graph of e_1 against $(e_1 - e_2)$

⇒ Axes drawn and labeled with unit

⇒ Suitable and convenient scales; 1 small square to be represented by any of the figures $(1, 2, 2.5, 5) \times 10^n$ where n is an integer

⇒ Plotting of five points correctly

⇒ Best fit to pass through most of the points or to average them.

⇒ Triangle of slope; right angled triangle with a hypotenuse which encloses all the plotted points.

⇒ Calculation of the slope without unit.

⇒ Calculation of the density of the material of the masses.

Marks

R₁ - 1

T₁ - ½

T₂ - 1

T₃ - 2 ½

-2 ½

-1

-1

-1

G₁ - ½

G₂ - 1

G₃ - 1

G₄ - 2 ½

G₅ - ½

G₆ - ½

C₁ - 1 ½

C₂ - 2

Total 20

2. To determine the refractive index, n of the material of the glass block provided

- ⇒ Tracing the outline of the glass block ABCD
- ⇒ Drawing line RO to AB at an angle $\theta = 80^\circ$
- ⇒ Fixing pins P3 and P4 to produce line PQ
- ⇒ Joining P to O
- ⇒ Drawing a table of results of 4 columns with all the values of θ entered with unit

$\theta(^{\circ})$	$\beta(^{\circ})$	$\cos\theta$	$\cos\beta$
80			
70			
60			
50			
40			
30			

- ⇒ Labeling of the rest of the columns with or without units
- ⇒ Recording 6 values of β increasing to no decimal place
- ⇒ Correct calculation of 6 values of $\cos\theta$ to 3 decimal places
- ⇒ Correct calculation of 6 values of $\cos\beta$ to 3 decimal places
- ⇒ Title of the graph; A graph of $\cos\theta$ against $\cos\beta$
- ⇒ Axes drawn and labeled without units
- ⇒ Suitable and convenient scales
- ⇒ Plotting of 6 points correctly
- ⇒ Best fit; line to pass through most of the points or to average the points
- ⇒ Triangle of slope; right angled triangle with a hypotenuse which encloses all the plotted points.
- ⇒ Calculation of the slope, n of the graph without unit.

D₁ - ½

D₂ - ½

D₃ - ½

D₄ - ½

T₁ - ½

T₂ - 1

T₃ - 6

-1½

-1½

G₁ - ½

G₂ - 1

G₃ - 1

G₄ - 3

G₅ - ½

G₆ - ½

C1 - 1

Total 20

3. To determine the internal resistance, r of the dry cell

⇒ Drawing a table of results of 3 columns with all the values of x entered with unit

x (cm)	V (V)	I (A)
30.0		
40.0		
50.0		
60.0		
70.0		
80.0		

⇒ Labeling of the rest of the columns correctly with unit

⇒ Recording 6 values of V to 2 decimal place in V

⇒ Recording 6 values of I to 2 decimal places in A

⇒ Title of the graph: A graph of V against I

⇒ Axes drawn and labeled with unit

⇒ Suitable and convenient scales; 1 small square to be represented by any of the figures $(1, 2, 2.5, 5) \times 10^n$ where n is an integer

⇒ Plotting of 6 points correctly

⇒ Best fit to pass through most of the points or to average them.

⇒ Triangle of slope; right angled triangle with a hypotenuse which encloses all the plotted points.

⇒ Calculation of the slope, S with unit.

⇒ Calculation of the internal resistance of the cell.

$T_1 - \frac{1}{2}$

$T_2 - 1$

$T_3 - 3$

-3

$G_1 - \frac{1}{2}$

$G_2 - 1$

$G_3 - 1$

$G_4 - 3$

$G_5 - 1$

$G_6 - 1$

$C_1 - 3$

$C_2 - 2$

Total 20

Sample Results

Question 1

$$P_o = 61.4 \text{ cm}$$

$m(\text{g})$	$P_1(\text{cm})$	$P_2(\text{cm})$	$e_1(\text{cm})$	$e_2(\text{cm})$	$(e_1 - e_2)(\text{cm})$
100	65.2	64.5	3.8	3.1	0.7
200	70.2	69.1	8.8	7.7	1.1
300	75.2	73.6	13.8	12.2	1.6
400	80.2	78.1	18.8	16.7	2.1
500	85.2	82.7	23.8	21.3	2.5

Question 1

$\theta(^{\circ})$	$\beta(^{\circ})$	$\cos\theta$	$\cos\beta$
80	84	0.174	0.105
70	76	0.342	0.242
60	70	0.500	0.342
50	65	0.648	0.423
40	59	0.766	0.515
30	54	0.866	0.588

Question 3

$x(\text{cm})$	$V(\text{V})$	$I(\text{A})$
30.0	0.60	0.46
40.0	0.70	0.40
50.0	0.75	0.36
60.0	0.85	0.34
70.0	0.90	0.30
80.0	0.95	0.28