



JINJA JOINT EXAMINATIONS BOARD

MOCK EXAMINATIONS

PHYSICS 535/3

MARKING GUIDE 2023

QUESTION ONE

R1	Record balance length l equals (0.48 - 0.52m).	$1\frac{1}{2}$
R2	Record length y at point of balancing y equals (0.48 - 0.52m).	$1\frac{1}{2}$
T1	Design a table with 4 columns with all values of m entered in given order.	2
T2	Labels of columns with correct units $l(m)$, $y(m)$, $\frac{1}{y}(m^{-1})$.	$1\frac{1}{2}$
T3	Record 5 more values of l increasing.	5
	Record 5 more values of y decreasing.	5
	Record 6 values of $\frac{1}{y}(m^{-1})$ correctly calculated to 3sf.	3

$m(kg)$	$l(m)$	$y(m)$	$\frac{1}{y}(m^{-1})$
0.050	0.614 - 0.654	0.346 - 0.386	
0.100	0.690 - 0.271	0.271 - 0.311	
0.150	0.738 - 0.778	0.222 - 0.262	
0.200	0.775 - 0.815	0.185 - 0.225	

0.250	0.800 - 0.840	0.160 - 0.200	
0.300	0.822 - 0.862	0.128 - 0.178	

G1	Title of graph: m against $\frac{1}{y} (m^{-1})$	1
G2	Label of axes m on the vertical axis, $\frac{1}{y} (m^{-1})$ on horizontal.	1
G3	Suitable and convenient scales	2
G4	Plot 6 points correctly.	3
G5	Draw the best straight line	1
G6	Indicate methods of finding slope with large right angled triangle.	1
C1	Calculate the slope of the graph	1
	- Correct substitution	
	- Correct arithmetic	
	- Accuracy	
	Sources of error	$\frac{1}{2}$
	- Failure to balance metre rule correctly.	
	- Reading distances l and y wrongly	
	Total	30

QUESTION TWO

D1	Tracing the outline of the glass block and labelling it as ABCD.	$\frac{1}{2}$
D2	Draw a normal to AB at M such that AM=3 cm and drawing line PM making 60° to the normal.	$\frac{1}{2}$
D3	Fixing pins P1 and P2, replacing glass block on its outline and fixing pins P3 and P4 to appear in line with images of P1 and P2.	$\frac{1}{2}$
D4	Drawing line through P3 and P4 to meet CD at Q, joining Q to M.	$\frac{1}{2}$
T1	Design a table with 5 columns with all values of angle i entered	1
T2	Label of the rest of the columns: $y(^{\circ})$, $x(^{\circ})$, $\cos x$, $\cos y$.	2
T3	Record 6 values of y increasing.	6
	Record 6 values of x increasing	6
	Record 6 values of $\cos x$ correctly read from table to 3sf.	$1\frac{1}{2}$
	Record 6 values of $\cos y$ correctly read from tables to 3sf.	$1\frac{1}{2}$

I(°)	Y(°)	X(°)	Cos y	Cos x
60	28 - 32	52 - 56		
50	38 - 42	56 - 60		
40	48 - 52	63 - 67		
30	58 - 62	70 - 74		
20	68 - 72	76 - 80		
10	78 - 82	80 - 84		

G1 -	Title of graph: cos x against cos y.	1
G2 -	Label of axes. ; Cos x on vertical, cos y on horizontal.	1
G3 -	Suitable and convenient scales.	2
G4 -	Plot 6 points correctly.	3
G5 -	Draw best straight lines.	1
G6 -	indicate methods of finding slopes.	$\frac{1}{2}$
C1	Calculation of slope w	$\frac{1}{2}$
	- Correct substitution	
	- Correct arithmetic	
C2 -	Calculation of n	$\frac{1}{2}$
	- Correct substitution and arithmetic	
	- accuracy 1.4 – 1.6	
E	Source of error	

	- wrong replacement of glass block on its outline	$\frac{1}{2}$
	inaccurate measurement of angle i	
	Total	30

QUESTION THREE

T1	Design a table of 5 columns with all x values entered.	1
T2	Label of columns with correct units $I(A)$, $V(V)$, $\frac{1}{x}(m^{-1})$, $\frac{1}{V}(\Omega^{-1})$	2
T3	Record 6 values of I.	6
	Record 6 values of V.	6
	Record 6 values of $\frac{1}{x}$ correct to 3 sf.	1
	Record 6 values of $\frac{1}{V}$ correct to 2 sf.	1

X(m)	I(A)	V(V)	$\frac{1}{x}(m^{-1})$	$\frac{1}{V}(\Omega^{-1})$
0.900	0.38	2.2	1.11	
0.800	0.40	2.1	1.25	
0.700	0.44	2.0	1.43	
0.600	0.46	2.0	1.67	
0.500	0.50	1.9	2.00	
0.400	0.52	1.8	2.50	

G1	Title of graph $\frac{1}{V} (\Omega^{-1})$ against $\frac{1}{x} (m^{-1})$	1
G2	Label of axes $\frac{1}{V} (\Omega^{-1})$ on vertical axis and $\frac{1}{x} (m^{-1})$ on the horizontal.	2
G3	Suitable and convenient scales.	2
G4	Plot 6 points correctly.	3
G5	Draw the best straight line.	1
G6	Method of finding slope by use of large right angled triangle.	1
C1	Calculation of slope	$\frac{1}{2}$
	- Correct substitution	
	- Correct arithmetic	
	- Recording intercept C on 1/v axis and unit	$\frac{1}{2}$
C2	Calculation of alpha (symbol)	$\frac{1}{2}$
	- correct substitution	
	- correct arithmetic	
C3 -	Calculation of R	1
	Correct substitution	
	Correct arithmetic	
	Correct value (8 – 10 ohms(symbol)	
	Possible error	$\frac{1}{2}$
	Failure to read ammeter and voltmeter correctly	
	Connecting the circuit Poorly.	
TOTAL		30

END.

6