LANJET CLUSTER JOINT MOCK EXAM
PHYSICS PAPER 3
DECEMBER 2020
MARKING SCHEME

QUESTION ONE (PART A)

(a) Mass of marble (mark students value) ✓½
(d) Table 1
Award 2 marks for complete table values.
Correct to 2d.p. for time of oscillation and at least 2d.p. for periodic time.
Award 1 mark for complete table without adherence to accuracy.
Award 0 for incomplete table.
T = 0.70s (Use students averaged with a range of ± 0.02s ✓½
(e) d = 1.70cm ± 0.05cm ✓½
r = 0.85cm✓½

(f) $V = \frac{4}{3} \times 3.142 \times (0.85)^3$

= 2.573cm³✓¹

(g) $R = r + \frac{5gT^2}{7(2\pi)^2}$ ✓¹

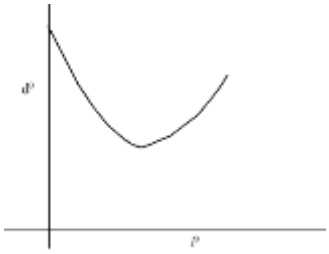
$= \frac{5 \times 9.8 \times (0.70)^2}{7 \times (2 \times 3.142)^2} + 0.85$

= 0.9369cm ✓¹
* Check substitution and answer of the student.

QUESTION 1 PART B

(d) 60^0
(L) Values of d decrease, then increase. Mark the trend. (8 marks)

m).



Scale
Axis labelled
Plotting
Curve

(n) Read from the graph the minimum value for d (30^0)

(p) Numerator and evaluated
Denominator and evaluated
Substitution

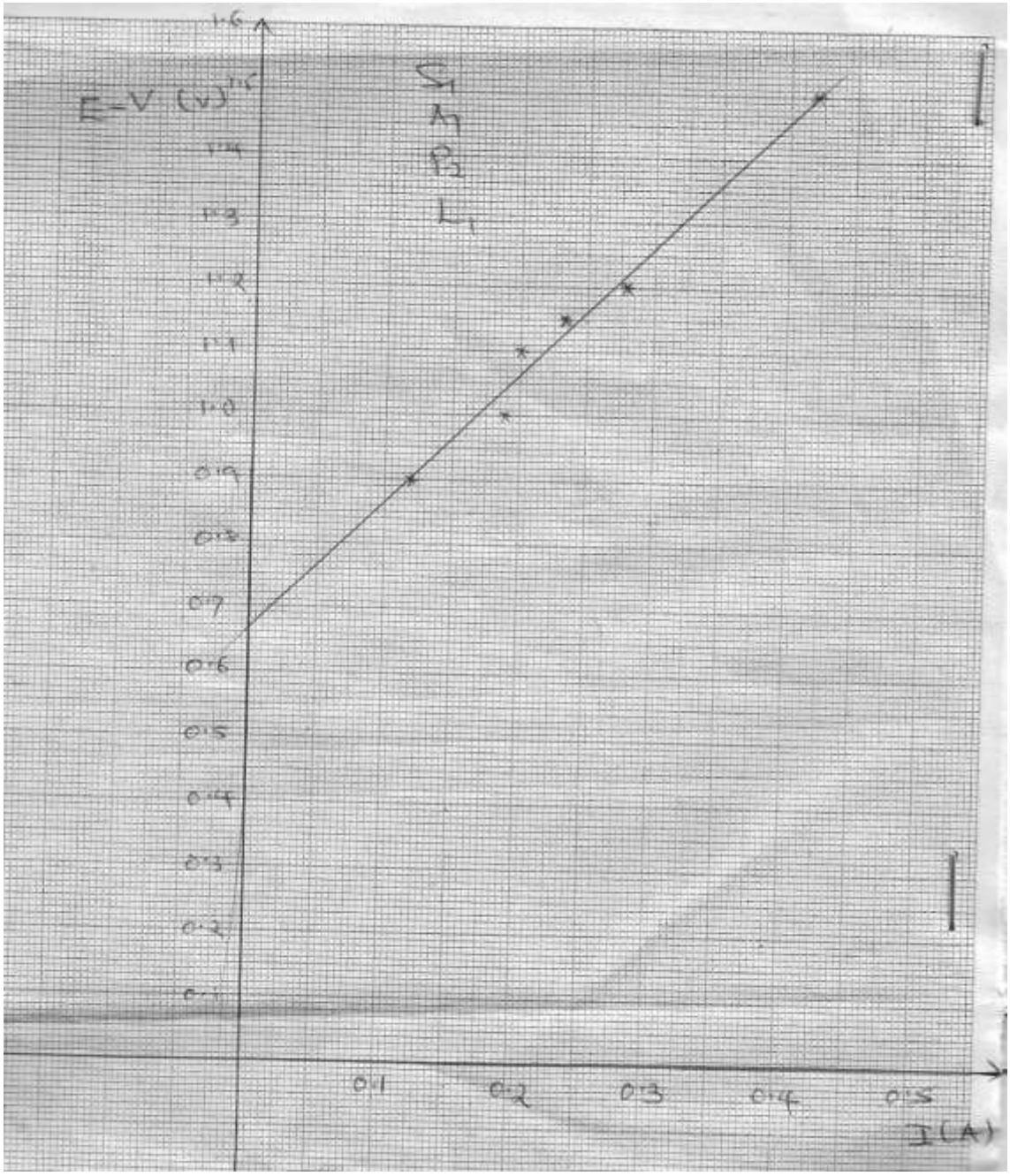
Accuracy, n = 1.5

QUESTION 2.

1. b) I = 0.12 ± 0.01A✓[1]
   V = 2.6 ± 0.1V ✓[1]
   c) E = 3.3 ±0.2V ✓[1] maximum range, E = 3.5
   d)

Length L (cm)	100	70	60	50	40	20
I (A)	0.12	0.19	0.2	0.24	0.28	0.42
P.d (V)	2.6	2.5	2.4	2.35	2.3	2.0
E – V (v)	0.9	1.0	1.1	1.15	1.2	1.5

Use the E of the student in the row containing the values of E – V(f)



f) Slope = $\frac{\Delta(E-V)}{\Delta I}$ ✓1 = $\frac{1.5-0.9}{0.42-0.12}$ ✓1 = $\frac{0.6}{0.3}$ = 2Ω

g) E = V + Ir

E – V = rI + C ✓1

r = internal resistance = slope = 2Ω ✓1