PHYSICS PAPER 3
MARKING SCHEME

1. b) I = 0.12 $\pm$ 0.01A ✓1

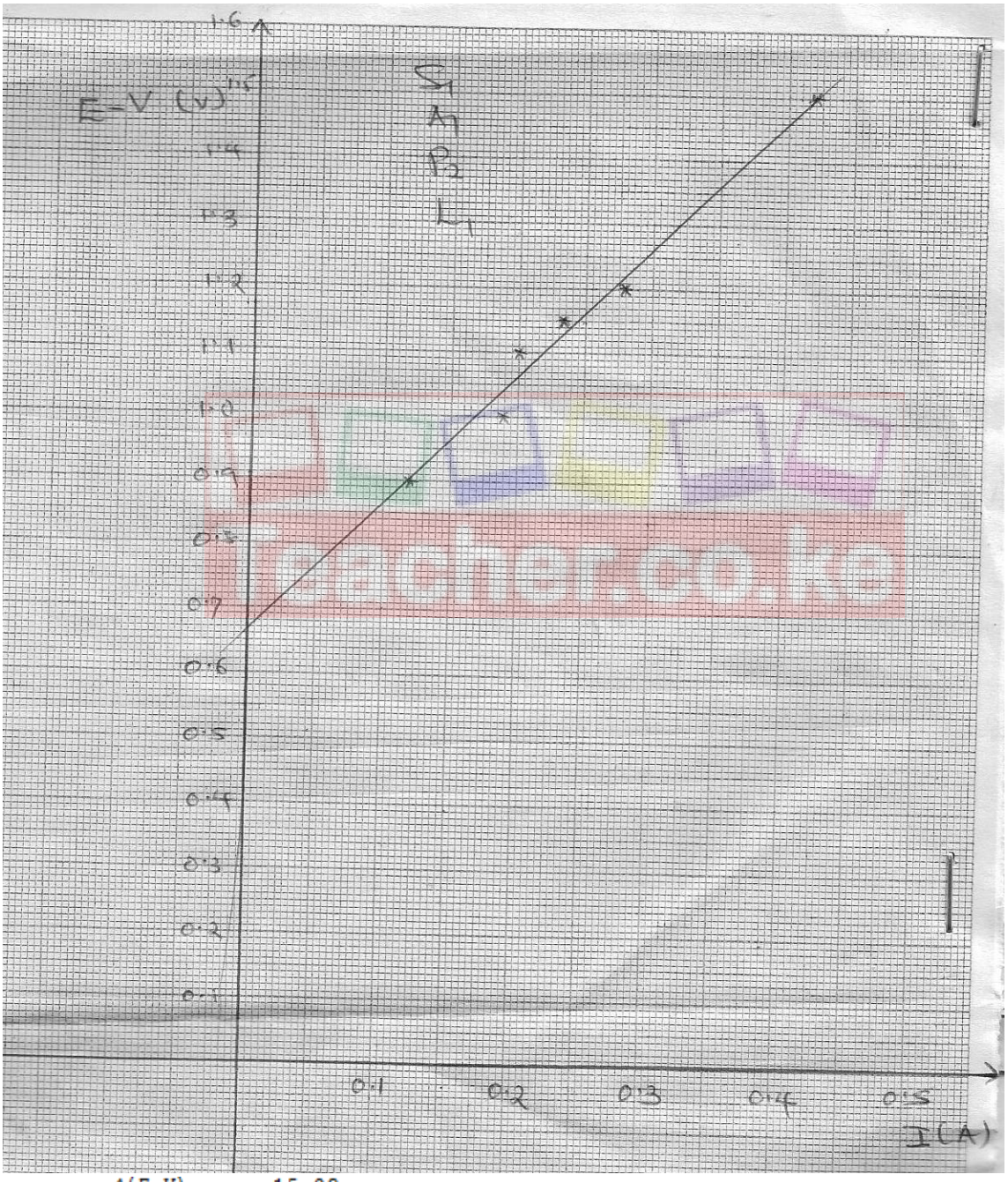
   V = 2.6 $\pm$ 0.1V ✓1

   c) E = 3.3 $\pm$0.2V ✓1 maximum range, E = 3.5V

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

$= \frac{0.6}{0.3} = 2\Omega$ ✓1

g) E = V + Ir

E – V = rI + C ✓1

r = internal resistance = slope = 2Ω ✓1

2. a) i) V = 12.27cm^3 ± 0.1✓1

ii) Measure the diameter and the height of the cylindrical mass. Apply the formula V = $\pi r^2 h$✓1

b) i) 50.0cm ± 0.2✓1

X (cm)	5	10	15	20	25	30
Y (cm)	4.5✓½	8.5✓½	13.0✓½	17.3✓½	21.5✓½	25.8✓½

d) Slope S = $\frac{\Delta y}{\Delta x} = \frac{17.3-4.5}{20-5} = \frac{12.8}{15} = 0.853$ ✓1

S = 0.853 ± 0.01 ✓1

e) S = 0.853

W = 1

F = SW = 0.853 x 1 = 0.853N✓1

U = actual weight – apparent weight

= 1N – 0.853N = 0.147N✓1

f) Density = $\frac{mass\ of\ the\ displaced\ salt\ solution}{volume\ of\ the\ displaced\ salt\ solution}$

$= \frac{0.0147kg}{1.27 \times 10^{-5}m^3}$ ✓1

= 1157.48kg/m^3✓1

Or

$\frac{14.7g}{12.7cm^3} = 1.1548 g/cm^3$