

JOINT EXAMINATION
FORM 3PP3 PHYSICS
TERM 3-2023 (OCTOBER)
MARKING SCHEME

1. a) L_0 - $\frac{1}{2}$ mk answer to 1d.p
 $\frac{1}{2}$ mk correct unit (cm)

b. ii) (8mks)

Mass (g)	0	20	30	40	50	60	70	80	90	100
Weight (force) N										
Reading, L cm										
Extension, e(cm)		1.0	2.6	4.8	6.3	8.1	10.2	12.3	14.2	16.4

2mks@ Row (force) – correct evaluation and substitution

$$F = mg$$

L to 1 d.p

e correct (L- L_0) to 1 d.p

- v) Graph of Force(N) vs extension, e (cm). (5mks)

Correct labelling of axis – 1mk

Scale – simple and uniform – 1mk

Plotting (2mks) (7-10 points) – 2mks

(5-6 points) – 1mk

(0-4 points) – 0 mk

Line – straight line passing through the origin – 1mk

- vi) Slope, $s = \frac{\Delta f}{\Delta e} = 0.8\text{N/cm} \pm 0.01$ (3mk)

Clear points from the graph - 1mk

Correct evaluation - 1mk

Answer - $\frac{1}{2}$ mk

Correct unit - $\frac{1}{2}$ mk

- vii) Correct substitution of $k=se$ - 1mk

Correct evaluation - 1mk

Answer - $\frac{1}{2}$ mk

Correct unit - $\frac{1}{2}$ mk

2. a)

- i) $E = 3.0 \pm 0.1$ to 1 d.p - $\frac{1}{2}$ mk

Correct unit - $\frac{1}{2}$ mk

- ii) $V = 2.5\text{v} \pm 0.1$ 1 d.p (1mk) and correct unit

$I = 0.20\text{A} \pm 0.02$ 2 d.p (1mk) and correct unit

iii) V is less than E due to the lost voltage; voltage against the internal resistance of the cell. (2mk)

iv) $V_1 = 1.4V \pm 0.1$ Correct reading to 1 d.p - 1/2mk
Correct unit - 1/2mk

v) $R = \frac{V_1}{I} = 10\Omega \pm 1$
Correct substitution - 1/2mk
Correct evaluation - 1/2mk
Answer in 4s.f - 1/2mk
Correct unit - 1/2mk

b (i) $d = 0.36\text{mm} \pm 0.01$ to 2 d.p (1mk)
d= in metres – correct conversion to 5 d.p (1mk)

(iii) $I = 0.10A \pm 0.02$ Correct reading - 1/2mk
Correct unit - 1/2mk

iv) $V_2 = 1.9v \pm 0.1$ Correct reading - 1/2mk
Correct unit - 1/2mk

v) $R = \frac{V_2}{I}$ Correct substitution - 1mk
Correct evaluation - 1mk
Answer in 4s.f - 1/2mk
Correct unit - 1/2mk

vi) $K = \frac{R}{1 \text{ metre}}$ Correct evaluation - 1mk
Answer - 1/2mk 4s.f
Correct unit - 1/2mk (Ωm^{-1})

vii) $Q = \frac{\pi k d^2}{4}$ Correct evaluation - 1mk
Answer in 4s.f - 1/2mk
Correct unit - 1/2mk (Ωm)