

FORM FOUR END OF SECOND TERM EXAM

Kenya Certificate of Secondary Education

PHYSICS

Paper - 232/3

July/August - 2018

MARKING SCHEME

1. a) correct averaging - $\frac{1}{2}$ mark

$d = 0.42\text{mm} \pm 0.05$ - $\frac{1}{2}$ mark

d)

L(cm)	L(m)	V(volts)	I(mA)	I(A)	$R = \frac{V}{I}(\Omega)$
20	0.200	0.20	0.20	0.0002	1000
30	0.300	0.30	0.18	0.00018	1667
40	0.400	0.38	0.16	0.00016	2375
50	0.500	0.45	0.15	0.00015	3000
60	0.600	0.50	0.14	0.00014	3571
80	0.800	0.60	0.12	0.00012	5000

$\pm 0.01 \pm 0.01$

L column : All correct 3 dp a must

V column : correct $\frac{1}{2}$ mark \rightarrow 3 marks

I (mA) column : @ correct $\frac{1}{2}$ mark \rightarrow 3 marks

I(A) column : All correct \rightarrow $\frac{1}{2}$ mark

R column : All correct \rightarrow 1 mark

for V range = ± 0.01

for (ImA) range ± 0.01

e) i) well labelled with units - 1 mark

Scale : simple, uniform and accommodating - 1 mark

Plotting : A maximum of 4 correctly plotted point @ $\frac{1}{2}$ mark - 2 marks

Line : A line of +ve gradient passing through at least 3 correctly plotted points @ 1 mark

ii) Slope = $\frac{\Delta R/\Omega}{\Delta L(m)} = \frac{5000 - 1000}{0.8 - 0.2} = \frac{4000}{0.6} = 6666 \Omega / m$

- read from graph (1 mark)

- correct substitution (1 mark)

- correct evaluation of gradient with correct unit (1 mark)

iii) $R = e \frac{L}{A}$ Comparing with $y = mx + c$

Correct substitution of r from (a)

$$\frac{e}{A} = \text{slope} (1) = s \quad e = \text{slope} \times A(1) = 6666 \times \frac{22}{7} \times (2.1 \times 10^{-4}) (1)$$

$$= 9.24 \times 10^{-4} \Omega m$$

2. $W = 0.55 \text{ cm} \pm 0.10 \text{ cm}$ 2.dp - must \rightarrow $\frac{1}{2}$ mark
 $= 0.0055 \pm 0.0010 \text{ m} \rightarrow \frac{1}{2}$ mk (correct conversion)

P(cm)	21	19	17.0	15.0	13.0	10.0	8.0	6.0
q(cm)	17	17.9	18.8	19.4	19.6	20	19.7	18.9
Time t for 10 (S) oscillations	8.5	9.3	10	10.5	11.3	14.9	16.8	20
Periodic time T for 1 oscillations (S) $\frac{P}{q}$								

4.0	2.0	
18.4	17.8	± 0.3
26	32.0	± 0.5

Value of q-correct to at least 1dp 7 - 10 values correct **2 marks** / 4- 6 values correct - 1 mark / 2 - 3
 Values correct - $\frac{1}{2}$ mark
 Else - 0 mark max - 2 marks

Values of t - $\frac{1}{2}$ mark each (maximum 6 values) max = 3 marks
 T - correct conversion / 8 - 10 correct conversions - 1 mark 5 - 7
 Correct conversion - $\frac{1}{2}$ mark - Else 0 mark max = 1 mark
 $\frac{q}{P}$ - correct evaluation (correct to at least 1dp)
 $\frac{7}{10}$ - 10 correct - 1 mark 4 - 6 correct - $\frac{1}{2}$ mk / Else 0 marks
 Max = 1 mark

NB
 for q 1 dp a must
 for T 2dp a must
 for $\frac{q}{P}$ exact or 3 s.f

ii) Graph

- Well labelled Axes (A) (1 mark)
 (having units in Y axis only.)
 NB: If units are shown on $\frac{q}{P}$ axis, deny the 1 mark for axis.
 Uniform, simple scale (S)
 Correct plotting of points (P)

6 points above - 2 marks
 3 - 5 points 1 mark
 Else 0 mark

- A smooth curve passing through at least 4 correct points. - 1 mark

f) i) Slope / gradient.

- Tangent drawn around the curve points plotted including $\frac{q}{P} = 2.0$ ($\frac{1}{2}$ mark)
 Correct intervals $\frac{1}{2}$ mark
 Correct evaluation to 2dp (1 mark)
 Accuracy (0.32 ± 0.005) (1 mark)

g) Correct substitution of S, π , D and g in SI units $\frac{1}{2}$ mark

Correct evaluation exact or 3sf 1 mark
 Correct unit $\frac{1}{2}$ mark

h) Correct substitution of L and W in SI unit - 1 mark

Correct evaluation exact or 3 sf 1 mark