NTIMA, NYAKI AND MUNICIPALITY CLUSTER EVALUATION 2016

PHYSICS
Paper 3
July/August 2016
MARKING SCHEME

PART A

a) d = 2.22cm ± 0.10cm ✓

b) iii)

Volume V of water (cm^3)	Height, h, of water (cm^3)
15	4.2
20	5.4
25	6.7
30	8
35	9.2
40	10.5

1mk each max 5mks ± 0.2cm

d) i) slope = $\frac{\text{change in y}}{\text{change in x}}$
= $\frac{(37.5 - 22.5)cm^3}{(10 - 6)cm}$ ✓ reading off and substitution (1mk)
= $3.75cm^2$ ✓ evaluation (1mk)
✓ units (1mk)

ii) $4s = kd^2$
$k = \frac{4s}{d^2}$
$k = \frac{4 \times 3.75}{(2.22)^2}$ ✓ substitution = 3.044 ✓ evaluation (1mk)

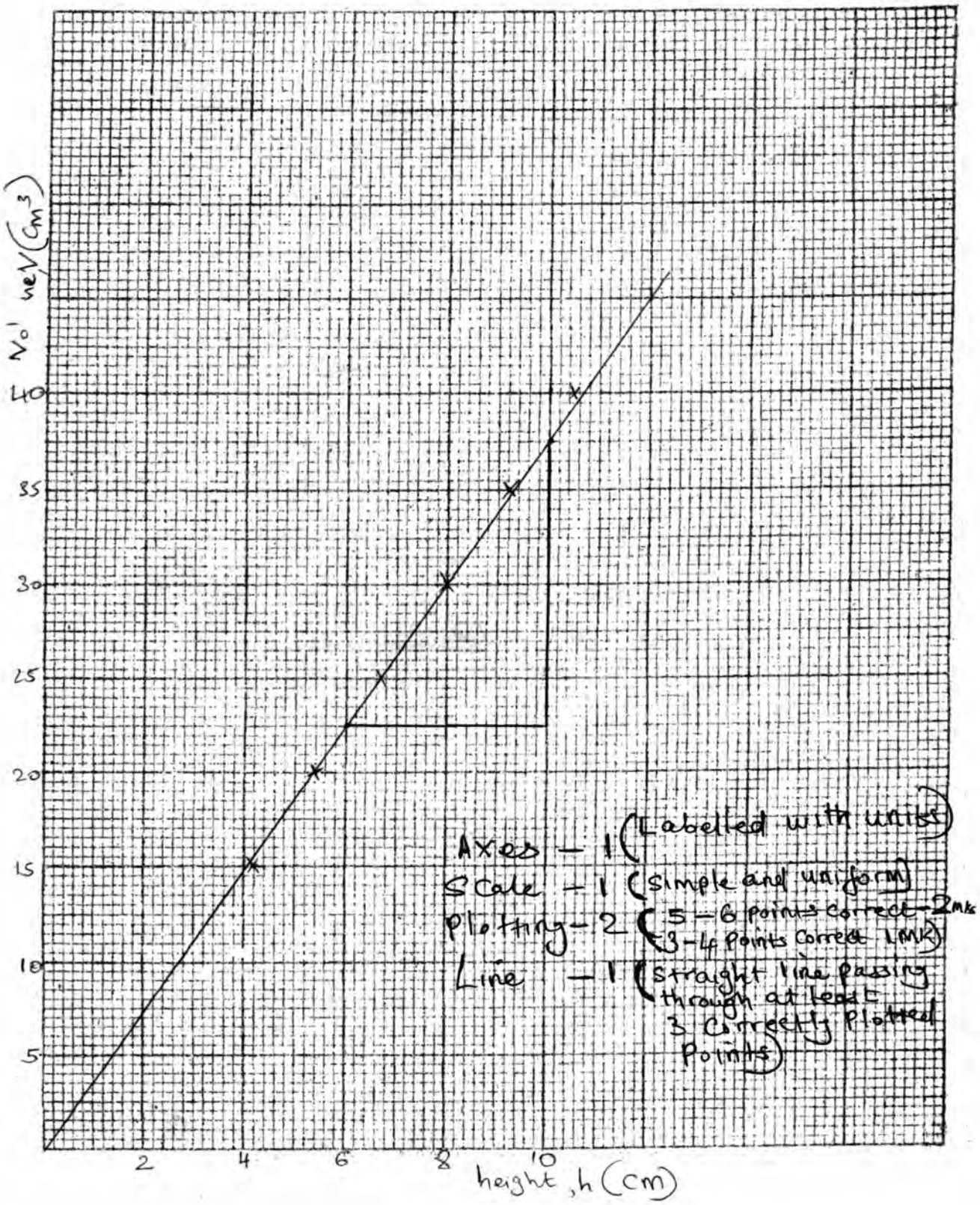
PART B

a) L = 10.2cm ± 0.10cm ✓

f) i) x = 6.7cm ± 0.50cm ✓
ii) $k = \frac{l}{x} = \frac{10.2}{6.7}$ ✓= 1.522✓substitution (1mk) evaluation(1mk)

iii) Refractive index ✓1

2. a) d = 0.36mm ± 0.02mm ✓½
d = 0.00036m ✓½ ± 0.00002m



b) 3.0V ✓1 ± 0.2V

d)

l (m)	V (volts)	I (A)	$R=\frac{V}{I}(\Omega)$
0.3	0.7	0.18	3.889
0.4	0.9	0.18	5.00
0.5	1.2	0.18	6.667
0.6	1.4	0.18	7.778
0.7	1.65	.0.18	9.167
0.9	2.05	0.18	11.389

NB: values of I should be constant

values of V: +0.05V ½mk each ***max 3mks*** ***values of I: 1mk +0.02A*** ***values of R: 1mk for at least***

f) i) slope = $\frac{\Delta y}{\Delta x}$ = $\frac{11 - 6.5}{0.85 - 0.5}$ ✓reading off and substitution (1mk)

= $\frac{4.5}{0.35}$ ✓ evaluation (1mk)

= 12.86Ω/m ✓ (units(1mk)

ii)

q = $\frac{3.142 \times (0.00036)^2 \times 12.86}{4}$ ✓subst. (1mk)

= $\frac{0.0000052366}{4}$

= 0.0000013091

= 1.3091×10^{-6}Ωm ✓ evaluation (1mk)

iii) r = $\frac{E - V}{I}$

= $\frac{E - IR}{I}$

= $\frac{3 - 0.18 \times 11.65}{0.18}$ substitution ✓

= $\frac{3 - 2.097}{0.18}$

= 5.017Ω evaluation ✓

units ✓