PHYSICS PAPER 3

MARKING SCHEME 2020

Question 1

b) e = 2.9v

c)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length L(m) | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| Current I (A) | 0.6 | 0.52 | 0.44 | 0.4 | 0.35 | 0.29 |
| $\frac{1}{I}$ (A-1) | 1.67 | 1.92 | 2.27 | 2.5 | 2.85 | 3.4 |

d) Gradient =$∆$ $\frac{1}{I}$(A-1) = 2.5 – 1.67

 $∆ $L (m) 0.5 – 0.2

 = 0.83 = 2.767 A-1m-1

 0.3

f)

h)i) d arc = 0.42mm

ii) X-section area A = 22/7 x (2.1 x 10-4)2 = 1.38 x 10-7m2

i) Gradient = $\frac{K}{AE}$ from equation $\frac{1}{I }$ = $\frac{K}{AE}$L + $\frac{Q}{E}$

but E = 2.9V, A = 1.38 x 10-7

 K = 2.767 x 1.38 x 10-7 x 2.9 = 1.107 x 10-6 Ωm

Q/E = intercept = 1.08A-1

Q = 1.08 x 2.9 = 3.132Ω

Question 2

|  |  |  |  |
| --- | --- | --- | --- |
| U(cm) | 40 | 45 | 50 |
| V(cm) | 39 | 35 | 32 |
| Magnification $\frac{v}{u}$  | 0.98 | 0.78 | 0.64 |

F= $\frac{v}{m+1}$

F1 = 39 = 19.6

 0.98 + 1

F2 = 395 = 19.7

 1.78

F3 = 32 = 19.5

 1.64

F avg = 19.6 + 19.7 + 19.5 = 19.6cm

 3

Favg = 19.6

****

**SECTION C**

a) G = 50 ± 0.5cm

b) p = 58.6cm

c)when y =5cm, x = 8.6 cm

W x 5 = 50/100 x 8.6

W = 0.05x8.6/5 = 0.086N