ASUMBI GIRLS HIGH SCHOOL

 PRE-MOCK

MAY-JUNE

2022

**PHYSICS PAPER 3**

**MARKING SCHEME**

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**QUESTION ONE .**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S | 60 | 65 | 70 | 75 | 80 | 85 | 90 |
| V | 38.0 | 44.0 | 50.0 | 55.5 | 61.0 | 67.0 | 72.5 |
| V1 | 22.5 | 22.0 | 20.0 | 19.5 | 19.0 | 18.0 | 17.5 |
| d = v-v1 | 15.5 | 22.0 | 30.0 | 36.0 | 42.0 | 49.0 | 55.0 |
| S2 | 3600 | 4225 | 4900 | 5625 | 6400 | 7225 | 8100 |
| d2 | 240.3 | 484.0 | 900.0 | 1296.0 | 1764.0 | 2401.0 | 3025.0 |
| S2 – d2 | 3359.7 | 3741.0 | 4000.0 | 4329 | 4636.0 | 4824.0 | 5075.0 |

* Award a mark for any values of greater than 5 ✓1✓1
* Award no mark less than 5
* Award a mark of any values f v1 more than 5 ✓1✓1
* d = v0 – v1 any five or more values ✓1
* s2 values award mark is ≥ 5✓1
* d2 values award mark is ≥ 5 ✓1
* s2 – d2 values award mark is ≥ 5✓1 max = 8marks

ii) Check for:

 Labelled axis (1 mark)

 Scale (simple/uniform/accommodative) ( 1 mark]

 Plotting (at least 4 points) ½ x 4 = (2 mks)

 Straight line (1 mark)

iii) Exact gradient = Δ used shown ✓1

$\frac{5200-0}{85-0}$✓1 = 61.176 ✓1

iv) K = 61.176

f = $\frac{61.176}{4}$✓1 = 15.29 = 15.0cm ✓1

v) Can be used to give a focal length value for inaccessible lens. ✓1

vi) Rough value for f = 15.5cm

**QUESTION 2**

**PART A**

b) Vo = 3.1 V √1 (min 1 dp)

d) Table 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Voltage (V) | 2.5 | 2.25 | 2.0 | 1.75 | 1.50 | 1.25*Min 1 dp* |
| Time, t (s) | 1.63 | 2.66 | 3.95 | 4.82 | 6.67 | 7.93 |

 Each value ½ (½ x 6 = 3 mks)

e)i)

 Axis = ½ mk

Scale = ½ mk

(½ x 4) Plotting = 2 mks

Curve – smooth curve with negative gradient passing through at least 4 correctly √1plotted points

Time, t (s)

Voltage,V

ii) V=Vo = 3.1 = 1.55V

 2 2

 t = 6.2 seconds →shown on the graph √½ within one small square

 Correct reading √½

f) R = t = 6.2 x 106

 0.693C 0.693 x 2200 (√½)

 = 4066.64Ω

 = 6.2 (√½ ) = 4066 Ω

 0.693 x 2200 x 10-6

h) i) L1 + 47.4 cm + 10cm

 ii) weight of the 50g mass 0.5N x 47.4 = W1 x 35

m

m

 100 100

 =50kg x 10N/kg

 1000 (0.5 x 0.474)Nm = (0.35W1)Nm

 =0.5N W1 = 0.5 x 0.474

 0.35

 W1 = 0.6771 N

Check for; - correct working for W1 in N \*g must be used, either the letter g or 10N/kg

* Correct evaluation ½ mk
* W1 must be in Newton (N)½ mk

h)iii)(I) L2 = 28.0 cm + 5cm (1 dp)

 (II) W2 = 0.28 x 0.05 x 10 - correct working for W2 in N \*g must be used

 0.35 - correct evaluation ½ mk

 = 0.4N - W2 must be in Newtons (½ mk)

j) T1 = 31oC + 5 - correct to the nearest whole number

k) (i) L3 = 28.5 cm + 5 ( 1 dp)

 ii) T2 = 83 oC + 5 (1dp)

 iii) W3 = 0.285 x 0.05 x 10

Terms Ref. h(ii)

 0.35

 = 0.41N

l) (0.6771 – 0.4) – (0.6771 – 0.41)

 (0.6771 – 0.41)(83 – 31)

 = 0.2771 – 0.2671

 0.2671 x 52

 = 0.01 = 7.1998 x 10-4K-1

 13.8892

 Check for: - correct substitution (1 mk)

 - correct evaluation (to at least 3. Sf)

 - units required (1 mk)