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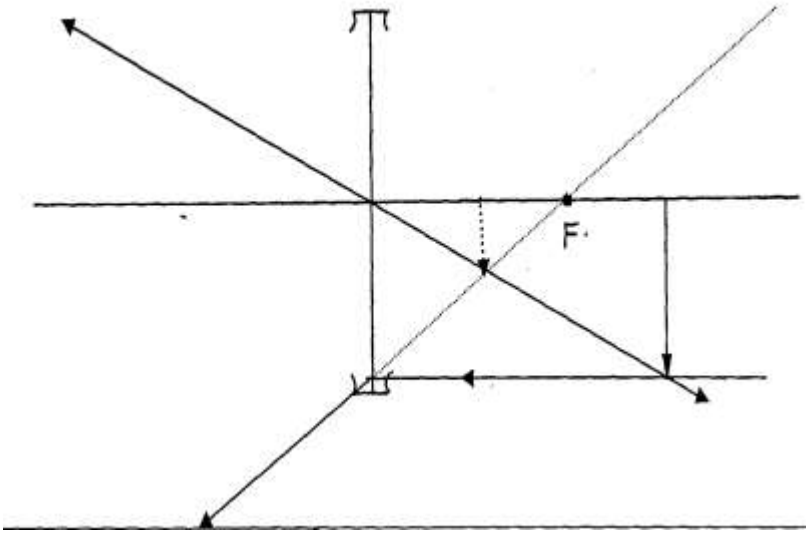
PHYSICS PAPER2

MARKING SCHEME

1. Regulates the amount of current needed for an electric component. ✓1
2. Ferromagnetic materials contain domains with dipoles facing in different directions for a particular domain✓1. During magnetization, all dipoles are made to face in one direction✓1. At this stage the material is said to be magnetically saturated.
3. 

4. The amount of accelerating potential. ✓1
5. Thermionic emission requires heat for an electron to be emitted from the surface of the metal ✓1while Photo electric-requires light energy of sufficient frequency for an electron to be emitted from the metal surface. ✓1

6. $20\times5=40F$

   $F=2.5N$✓1

Force R=(4-2.5)N

=1.5N✓1

R is a repulsive force. ✓1

7. $1/R_e = 1/2+1/2$

$R_e = 1\Omega$✓1

R=V/I

I=V/R✓1

=3A✓1

8. Ultra violet radiation✓1
9. time between two successive claps=50/20

=2.5seconds✓1

Distance travelled by sound to the wall and back=400×2

=800m✓1

Speed,s=distance/time

=800/2.5

=320m/s✓1

10. a)

b) –erect/upright

-real

-Same size as the object

Any two✓2

11. X – A beta particle✓1

a – 206✓1

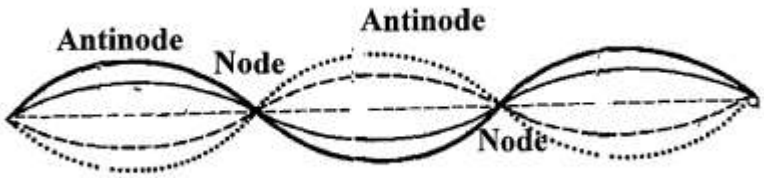
b – 82✓1

12. The gold leaf becomes more positive as a result of attraction of the negative charge towards the metal cap and as a result, the divergence of the leaf increases.✓2

SECTION B

13. a) In transverse wave, the vibration of particles is perpendicular to the direction of travel of the wave ✓1 but in longitudinal the vibration is parallel to the direction of the wave travel✓1

b) i.



ii. The distance between a node and anti node = ¼ λ ✓1

λ = 1.0 x 10^{-3} x 4
= 4.0 x 10^{-3} m✓1

c) 5 waves = 6.4 cm

λ = 6.4/5

= 1.28 cm✓1

V = fλ ✓1
= 1.28 x 8
= 10.24cm/s✓1

d) 2.5 complete oscillation
period T = 0.02/2.5

.

=0.008sec✓1
f=1/T✓1
=1/0.008
=125Hz✓1

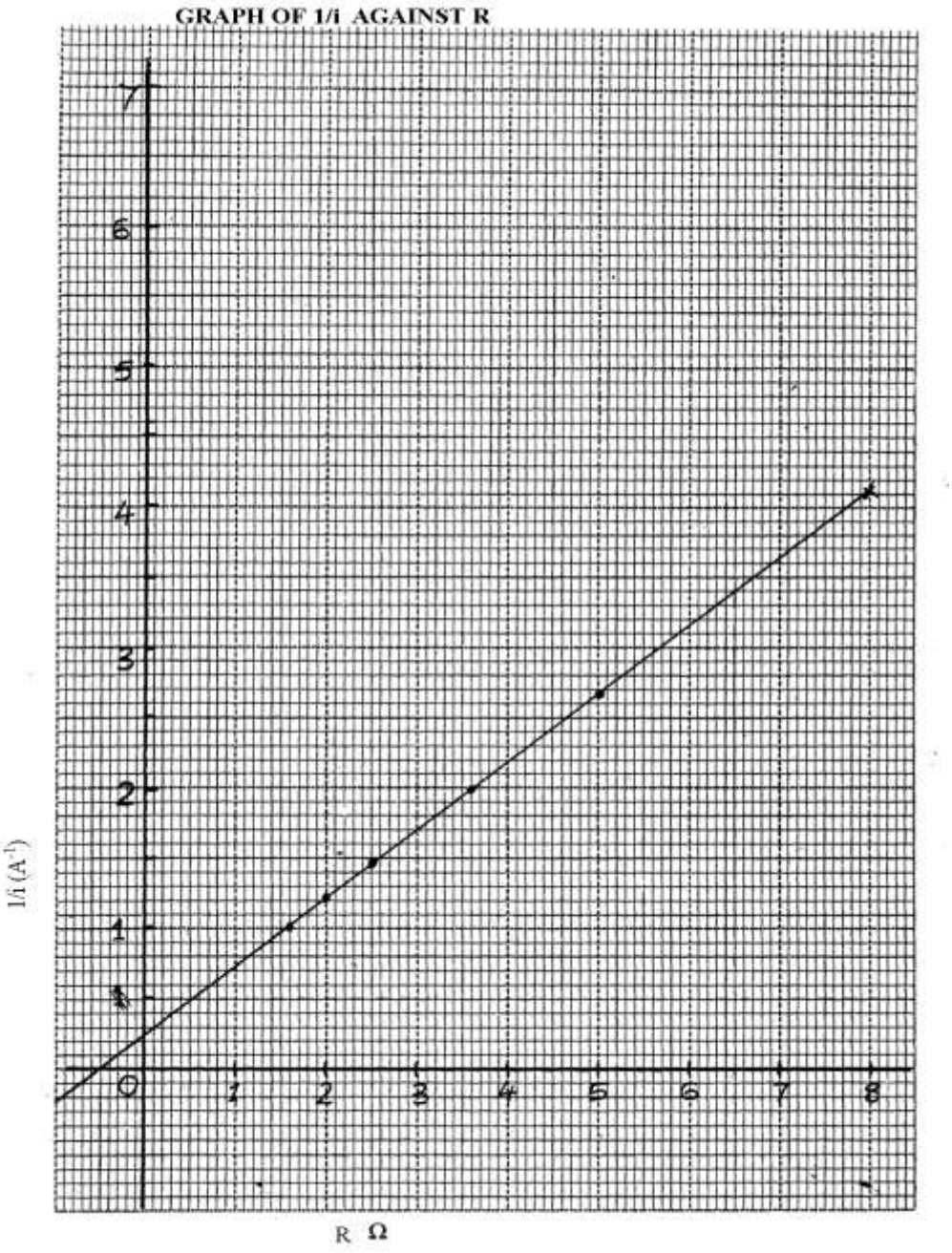
14. a) e.m.f is the potential difference across the terminal of a cell in an open circuit. ✓1

b) i

R(ohms)	1.6	2.1	2.5	3.6	5	8
i(A)	1	0.8	0.7	0.5	0.37	0.34
1/I (A^{-1})	1.000	1.250	1.429	2.000	2.703	2.941

□½ Mark for each correct entry to 3 d.p ✓3

ii.



□Axes✓1

□ Scale✓1

□Plotting✓ 2

□ Line✓1

iii. Gradient = 1/E✓1

$$=\frac{2.7-1}{5-1.6}$$

$=0.5$✓1

1/E=0.5

E = 2.0 V✓1

Y – Intercept = r/E

= 0.25✓1

R = 0.25 x 2.0

= 0.5Ω✓1 (**Allow for error transfer)**

15. a)- Area of overlap✓1

-Distance of separation ✓1
-Nature of the dielectric✓1

b)

✓2

c) i) Q=CV✓1
$=6 \times 2 \times 10^{-6}$
$=1.8\times10^{-5}$ C ✓1

ii) C_e=(2+4) μF
=6 μF✓1
P.d across 2 μF=6/2

=3V✓1

P.d across 4 μF=6/4

=1.5V✓1

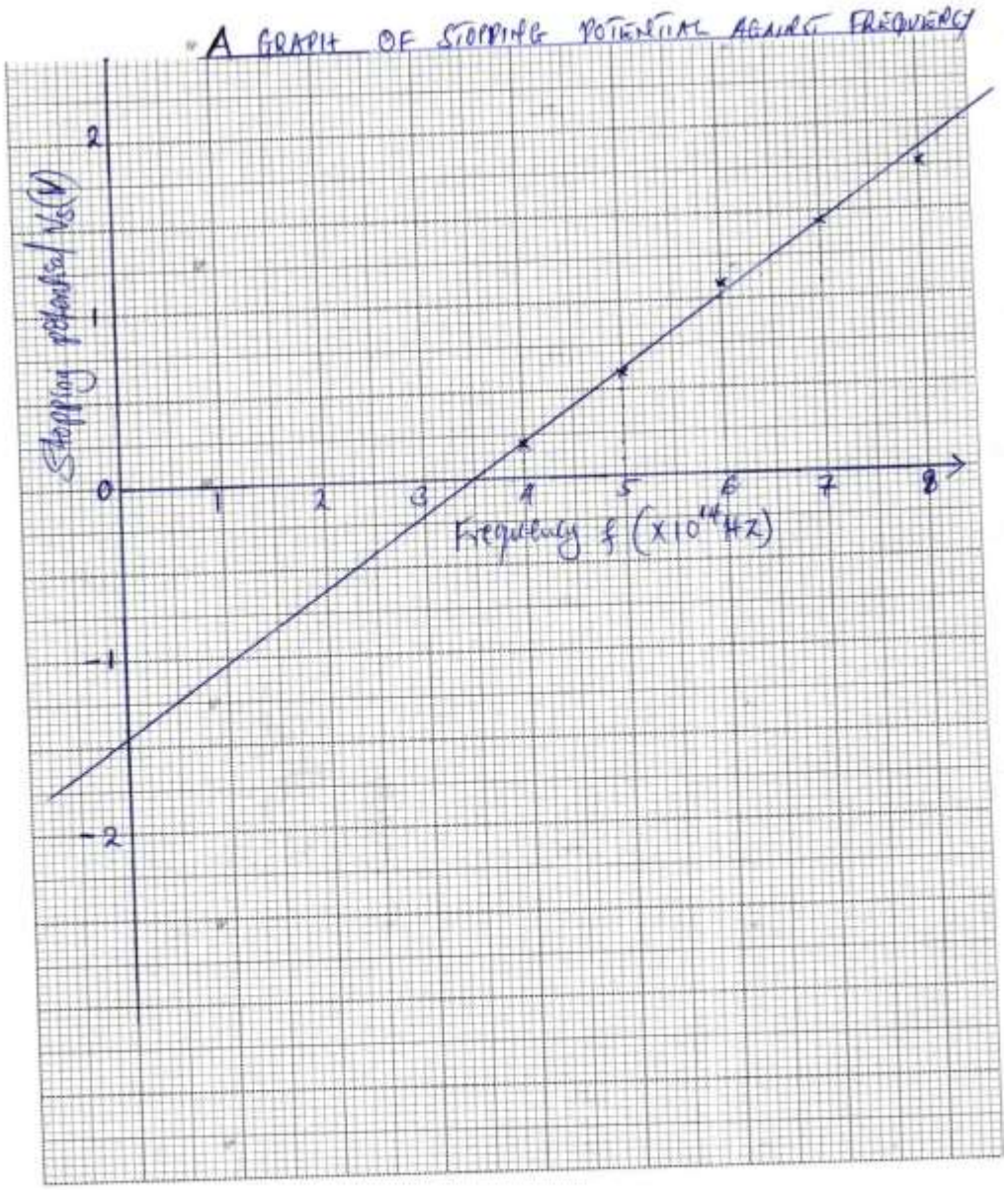
d) Moving clouds get charge by friction force. The clouds induce positive charges on the spikes of the arrester at the top of the conductor✓1. This makes the earthed plate to become negatively charged✓1. The negative charges on the earthed plate are immediately conducted to the ground through the copper strip✓1.

16. a) Is the minimum amount of energy needed to eject/dislodge an electron from a metal surface. ✓1

b) -intensity of the radiation. ✓1

-energy of the radiation. ✓1

-Type of metal. ✓1



END

c threshold frequency=x-intercept✓1

$=3.5\times10^{14}$ HZ✓1

i) $eV_s=hf-hf_o$

$V_s=hf/e- hf_o/e$

Slope=h/e

$=4.07\times10^{14}$✓1

$h= 4.07\times10^{14}\times e$

$= 4.07\times10^{14}\times1.6\times10^{-19}$

$=6.5\times10^{-34}$Js✓1

ii) $W_o=hf_o$✓1

$=3.5\times10^{14}\times6.5\times10^{-34}$

$=2.26\times10^{-19}$J✓1