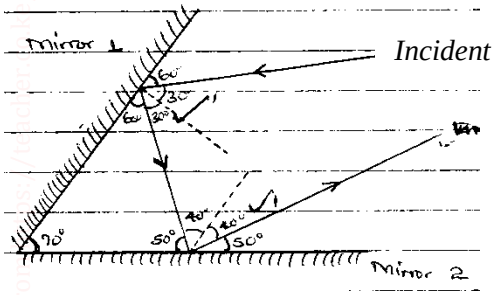
PHYSICS PAPER 2

MARKING SCHEME

FORM 3

END OF YEAR EXAM 2025

1.



All the angles must be indicated

2. Eight dry cells in series have a very high internal resistance✓1 hence very little current can be drawn from them✓1

3. The flame ionizes air producing both positive and negative ions✓1. The ions opposite to the charge of the electroscope are attracted to the cap of the electroscope causing discharge✓1.

4. (a) X - Violet✓1 *Give 1mk if the two are correct*
Y - Red ✓1

(b) Velocity ✓1

5. Light waves have very short wavelength.✓1

6. - Length of the conductor.✓1
- Cross section area of the conductors✓1

7. **a)Is a device used for storing charge**

b) $C=E_oA/d$

$= 8.85*10^{-12}*4*10^{-4}/6*10^{-4}$

$= 5.9*10^{-12}$

=5.90pF

Q = CV

$=590*10^{-9}*100$

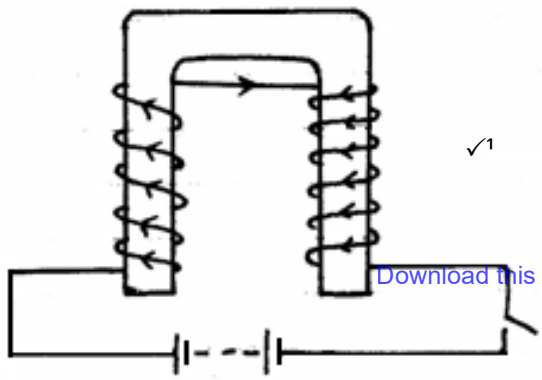
$= 5.9*10^{-10}C$

8. Q = It

= 0.8 x 6 x 60C ✓1

∴Q = 288C ✓1 (Units must be shown)

9. .

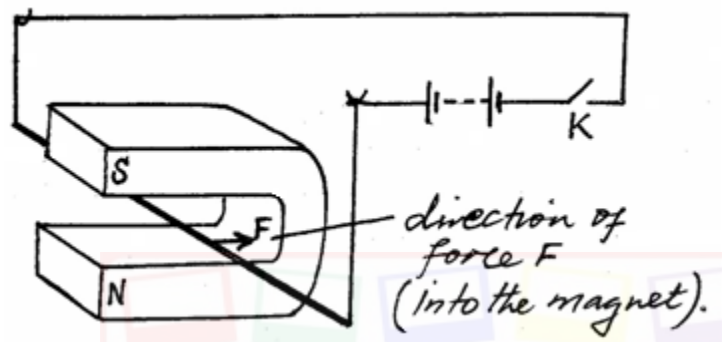


10. $Speed = \frac{2 \times distance}{time}$ ✓1

$= \frac{2 \times 120m}{0.75s}$ ✓1

$\therefore$ Speed = 320m/s ✓1

11. (a)



(b) - Reversing the direction of flow of electric current in the conductor.
- Reversing the direction of magnetic field;

12. .i) Soft iron✓1 since it is easily magnetized and demagnetized.

ii) - Increasing the amount of current ✓1

- Increasing the number of turns on the coil✓1

13,. a) i) it requires a medium fortransmission. ✓1

ii) It is propagated as a series ofalternating compressions (High pressure zones) and rarefactions (Low pressure zones)✓1**OR**
The direction of the wave travel is parallel to the disturbance that produces it ✓1 *(Any one)*

b) i) To evacuate the bell jar ✓1 **OR**
To pump air in and out of the bell jar ✓1 *(Any one)*

ii) The electric bell starts ringing but its sound as heard from outside the bell jar reduces in intensity and diminishes. ✓1 This is because as the air is pumped out, the density of air in the bell jar reduces. ✓1 As thiscontinues a vacuum is created in the bell jar which cannot transmit sound✓1hence the sound getdiminished

iii) - It is not possible to create vacuum in the bell jar ✓1
- Some sound is transmitted through the connecting wires and the walls of the bell jar.✓1

c) i) - It penetrates deepest. ✓1
- It can be reflected easily by tiny grains ✓1

ii) $S = \frac{D}{T} \Rightarrow$ D = 84 x 2 = 164m

T = 0.12s

$S = \frac{168}{0.12}$ ✓1 = 1400M/S ✓1

14 a) i) Double stroke method. ✓1

ii) A - South pole✓1

B - North pole✓1

iii) - Induction method.✓1

- Mechanical method - Hammering✓1
- Electrical method.✓1 *(Any one)*

b) i) Alternating current (a.c)

ii) It reverses many times per second, ✓1 disorienting the magnetic dipoles.✓1

c) So that they don't retain any magnetism✓1 due to earth's magnetic field.✓1

15. a(i) For a concave mirror ,is the point at which all rays parallel and close to the principal axis converge after reflection. For convex is the point at which all rays parallel and close to the principal axis appear to diverge from after reflection by the mirror

(ii) Is the centre of the sphere of which the mirror is part

(iii) Is a plane perpendicular to the principal axis and passes through the principal axis and passes through the principal focus

b) u=+18 cm

f= +12 cm

using 1/v+1/u=1/f

1/v+1/+18=1/+12

1/v+1/18=1/12

1/v=1/12-1/18

1/v=1/36

V=36

c) u = 12cm

v = - 36cm

u

f = 1/u+1/v

=1/2 +1/-36

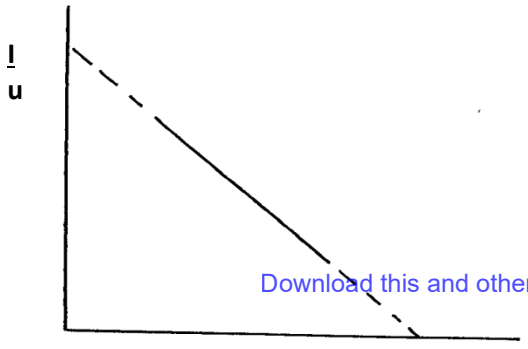
= 1/12 – 1/36

3-1/36

= 2/36

F= 36/2

= 18 cm



I
v

(i) $\frac{I}{u}$ – intercept = 0.07

$\frac{I}{f} = 0.07$

f = 0.07 = 1/ 0.07
= 14.29cm

(ii) $\frac{I}{f} = \frac{I}{u} + \frac{u}{v}$

$\frac{I}{14.29} = \frac{I}{20} + \frac{I}{v}$

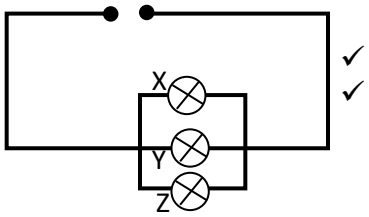
$\frac{I}{V} = \frac{1}{14.29} - \frac{1}{20}$

= 0.07 – 0.05

= 0.02

V = $\frac{1}{0.02}$
= 50cm

16. (a) (i) = V = IR $\Rightarrow$ R = $\frac{V}{I}$
= $\frac{12}{2}$ ✓
= 6Ω✓
(ii) Y, Z are parallel
$\frac{1}{R_P} = \frac{1}{6} + \frac{1}{6}$
$\Rightarrow P_P = 3\Omega$ ✓
X in series with P_P
$\Rightarrow R_T = (6 + 3)$
= 9Ω ✓
(iii) I = $\frac{V}{R}$ ✓
= $\frac{12}{9}$
= 1.33A ✓
(iv)



✓
✓

(b) (i) E.m.f = 1.5V

(ii) Terminal voltage = 1.3V

(iii) R = $\frac{V}{I}$

= $\frac{1.3}{0.5}$

= 2.6Ω

17.

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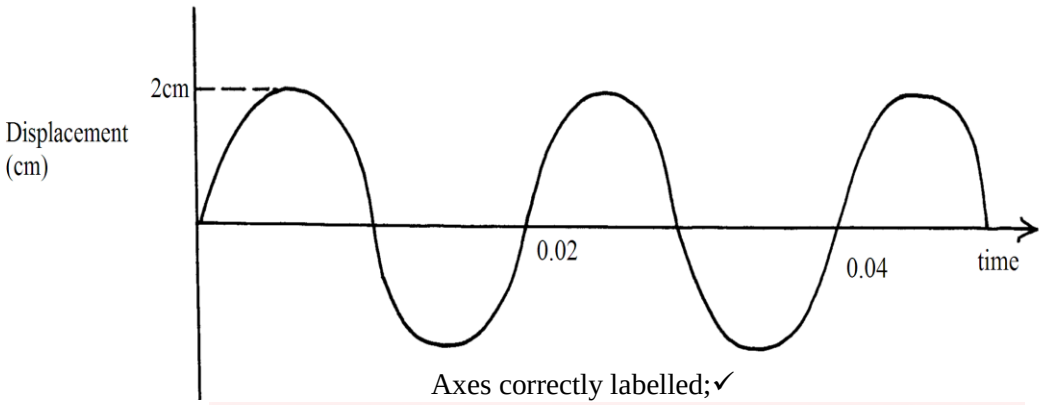

Axes correctly labelled;✓
2 complete circles:✓
T= 1/50 = 0.025; ✓correct time indicated;✓

b) Electromagnetic waves do not require a material medium ; ✓ while mechanical waves require material medium for their transmission; ✓

c) $V = \lambda f$; ✓

- $=21x10^3 \times 7.5 \times 10^{-2}$

- =1575m/s;✓

-

$2d = Vxt$;✓

$d = \frac{1575x0.4}{2}$

315m; ✓