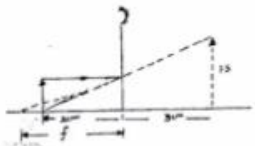
PHYSICS PAPER 2
TRIAL 2
MARCH
MARKING SCHEME

SECTION A (25 MARKS)

1.

Mark for construction for incident rays using laws of reflection then virtual rays to show position of the image;

2.



Draw a ray parallel to the principal axis reflected through the principal focus F;
Measure the distance between the mirror and f or the principal ray to determine C and radius of corvature r. focal length = $^{r}/_{2}$;

3. $P = \frac{V^2}{R}$

$R_A = \frac{V^2}{W}$ $R_B = \frac{(V/4)^2}{3W} = \frac{V^2}{48W}$ $R_A : R_B = \frac{V^2}{W} : \frac{V^2}{48W}$

$= 1 : 1$
$W \quad 48W$
$= 48:1$

4.

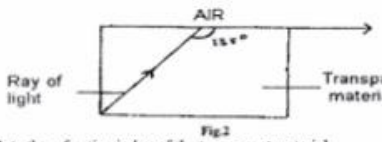


Fig.2

Calculate the refractive index of the transparent material.

$138 - 90 = 48^{0} = C$

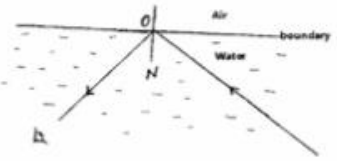
$n = \frac{1}{Sin C}$;

$n = \frac{1}{Sin 48}$

$n = 1.346$;

5. Charges concentrated by point action;
Similar charges from ionized gas repel while unlike charges attra

6.



At O there is total internal reflection because the angle of incidence is greater than the critical angle of water air. ;

7. Magnetism is easily induced in them; The dipoles of the Keepers form a closed loop with those in the magnets hence protecting the magnets from being demagnetized

8. Relative density of the acid;
- The voltage output;

9.

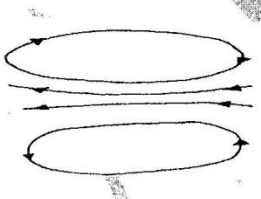
$$\frac{1}{C_s} = \frac{1}{2} + \frac{1}{5} = \frac{5+2}{10} = \frac{7}{10} \quad \Big\} \;;$$

$C_s = 10/7\ \mu F;$

$C_p = \frac{10}{7} + \frac{10}{1}$;

$= \frac{10+70}{7} = \frac{80}{7} = 11.43\mu F;$

10.



Pattern 1 mk
Direction 1 mk

11. The image remains unaffected✓by the change from a small circular hole to a small square hole..

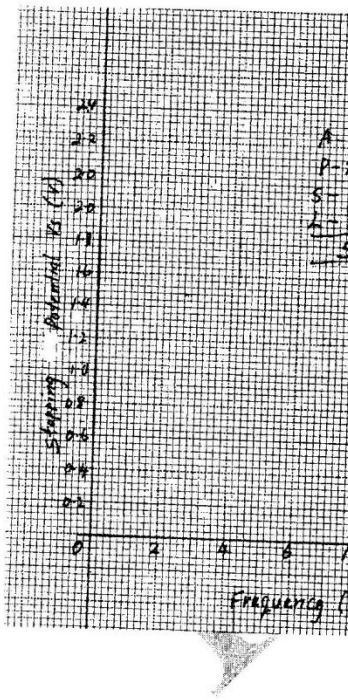
12. 3 kwh x 3 hrs
9kwh ✓

13. So that the p.d across them is the same ✓ accept this reduces resistance

SECTION B (55 marks)

GRAPH OF Q AGAINST V

14. (a)(i)



ii) slope = $\frac{\Delta Q}{\Delta V} = \frac{(60-30) \times 10^{-3}}{8-4}$;

(1 mk)

$= \frac{30 \times 10^{-3}}{4}$

7.5×10^{-3}F;

b)

$I = {}^{V}/_{I} = {}^{1}/_{3}$

$E = {}^{1}/_{3}r + {}^{2}/_{3} + 1$

$3E = r + 2 + 3$

$3E = r + 5$..... (2)

Case 2

$E = {}^{1.2}/_{3}r + {}^{1.2}/_{3} + 1.2$

$3E = 1.2r + 1.2 + 3.6$

$3E = 1.2r + 4.8$ –ii.

Equating (i) to (iii)

$1.2e + 4.8 = r + 5$

$1.2r - r = 5 - 48$

$0.2r = 0.2$

$r = 1$

$E = {}^{1}/_{3} + {}^{2}/_{3} + 1 = 2$ V

15. (a) Graph

Scale - (1mark)
Axes - (1 mark)
Plotting - (2 marks)
Line - (1 mark)

(b) Slope $= \frac{1.5}{15} = 0.1$

$f = \frac{1}{0.1} = 10$cm

(c) Power $= \frac{1}{f} = \frac{1}{10} = 0.1$ dioptives

(d)

Eye	Camera
Choroid layer black	camera box painted black
Image forms a retina	Image forms on photo film
Iris controls light entering	Diaphragm controls light entering
Has a crystalline convex lens	Has a convex lens

(e) Long sight defect where eye cannot see distant objects clearly but near one's only. (lens has long f or eyeball too short

16. (a)

Sound waves	Electromagnetic waves
Longitudinal	Tran
Require material medium	Do n
Have compressions and rare factions	They
Particles moves parallel to wave Motion	Parti to th

Any two pairs

(b) (i) 2 ½ Waves = 0.002 sec

1 wave $= \frac{0.002}{5}$ x 2;

$= 0.0008$ sec;

(ii) $V = \lambda f$;

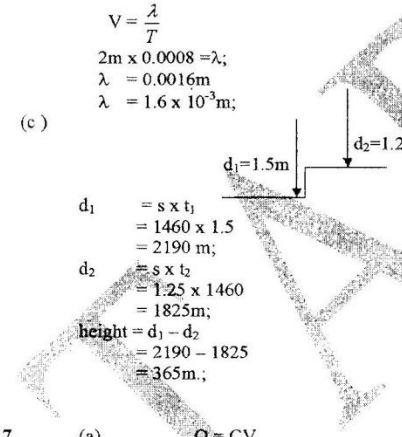
$V = \frac{\lambda}{T}$

$2m \times 0.0008 = \lambda$;

$\lambda = 0.0016$m

$\lambda = 1.6 \times 10^{-3}$m;

(c)



$d_1 = s \times t_1$

$= 1460 \times 1.5$

$= 2190$ m;

$d_2 = s \times t_2$

$= 1.25 \times 1460$

$= 1825$m;

height $= d_1 - d_2$

$= 2190 - 1825$

$= 365$m.;

17. (a) $Q = CV$

$Q = 10 \times 10^{-6} \times 300$

$= 3.0 \times 10^{-3}$ C

$C_T = 5 + 10 = 15\ \mu$f.

$V = \frac{Q}{C}$

$= \frac{3.0 \times 10^{-3}}{15 \times 10^{-6}}$ ✓ 1

$= 200$volts ✓ 1

(a) $E = \frac{1}{2} CV^2$ ✓ 1

$= \frac{1}{2} \times 10 \times 10^{-6} \times 300 \times 30$

$= 0.45$J ✓ 1

(b) $E = \frac{1}{2} \times 15 \times 10^{-6} \times 200 \times 2$

$= 0.3$J ✓ 1

18. (a) They never cross
Are continuous
Are under tension / try to } Any one ✓1

(b) (i) The current flowing through the copper loop produces a magnetic force ✓1 that repels ✓1 the magnet attached to the truck hence rebounds.

(ii) It moves to and fro ✓1 then comes to a halt ✓1 some distance away the coil.

(iii) Truck rebounds more ✓1 because a stronger repulsive force will be produce ✓1

(iv) If may not rebound ✓1 it will require a stronger repulsive force ✓1

(v) It does not rebound ✓1 the force due to the direct current is now attractive ✓1.