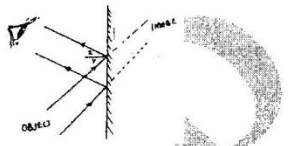
PHYSICS PAPER 2
TRIAL 2

MARKING SCHEME

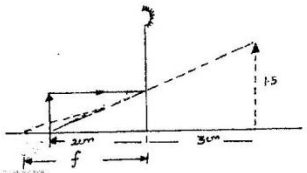
SECTION A (25 MARKS)

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

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

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

4.

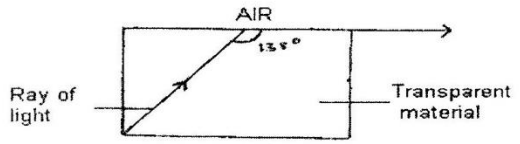


Fig.2

Calculate the refractive index of the transparent material. (3 marks)

$138 - 90 = 48^0 = C$

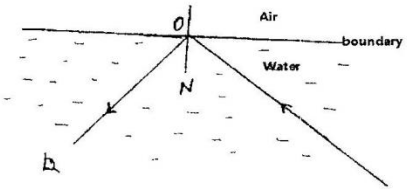
$n = \frac{I}{SinC}$;

$n = \frac{I}{Sin48}$

$n = 1.346$;

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

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.

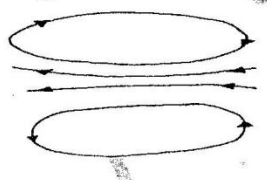
$$\frac{1}{C_s} = \frac{1}{2} + \frac{1}{5} = \frac{5+2}{10} = \frac{7}{10} \Big\} \;;$$

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

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

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

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..

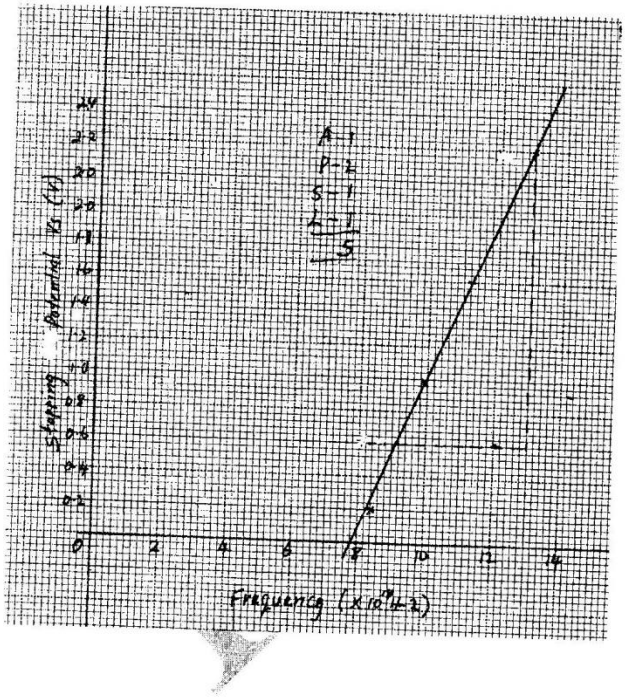
12. 3 kwh x 3 hrs
9kwh ✓

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; (1 mark)

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	Transverse
Require material medium	Do not require a material medium
Have compressions and rare factions	They have crests and troughs
Particles moves parallel to wave Motion	Particles moves perpendicularly to the wave motion.

Any two pairs (2 marks)

(b) (i) 2 ½ Waves = 0.002 sec

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

$= 0.0008$ sec; (2 marks)

(ii) $V = \lambda f$;

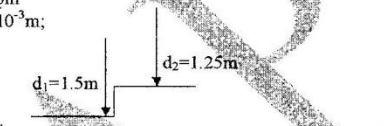
$V = \frac{\lambda}{T}$

$2m \times 0.0008 = \lambda$;

$\lambda = 0.0016m$

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

(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.; (3 marks)

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

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

$= 0.45$J ✓ 1

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

$= 0.3$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.