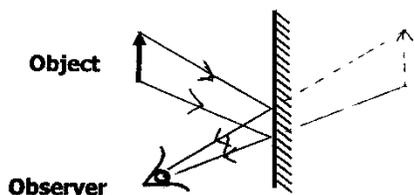


1.



$$2. 7.6 + 0.04 = 7.64, 7.64 + 0.02 = 7.66 \text{ cm}$$

3. Temperature

Density

4. Silvery walls reflect most of the radiant heat

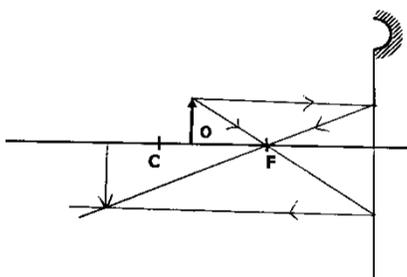
$$5. (a) \frac{2.5 \times 1}{5} = 0.5 \text{ Hz}$$

$$(b) f = \frac{v}{\lambda} = \frac{36}{0.5} = 72 \text{ m}$$

6. sum of anti-clockwise moments = sum of clockwise moments

$$30 \times 100 = 25 \times F. F = 120 \text{ N}$$

7.



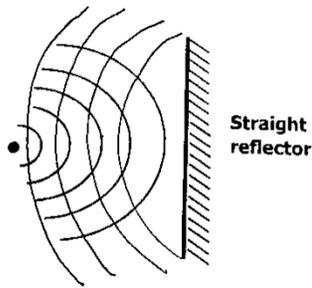
$$8. V = IR, I = \frac{240}{500} = 0.48 \text{ A}$$

9. Stable equilibrium

10. Use of Manganese (IV) Oxide

11. Cohesive force reduces/decreases

12. Positive



13. (a)

(b) Decrease in wavelength

Decrease in speed

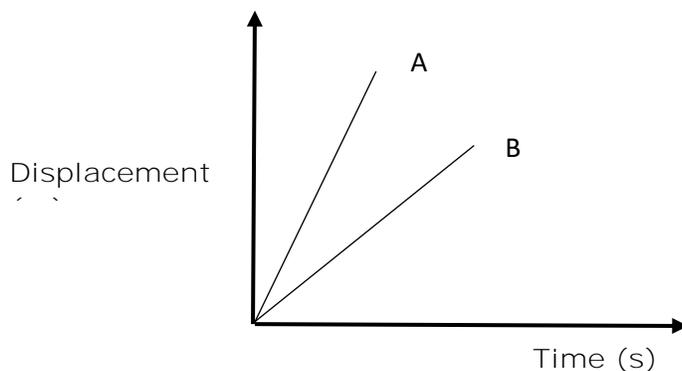
$$14.(a)(i) \quad T = \frac{1}{100} = 0.01 \text{ s}, u = \frac{45}{0.01} = 4500 \text{ cms}^{-1}, v = \frac{25}{0.01} = 2500 \text{ cms}^{-1}, a = \frac{2500-4500}{8 \times 0.01} = -250 \text{ cms}^{-1} (-2.5 \text{ ms}^{-1})$$

Or

$$v = \lambda f, u = 45 \times 100 = 4500 \text{ cms}^{-1}, v = 25 \times 100 = 2500 \text{ cms}^{-1}, a = \frac{2500 - 4500}{8 \times 0.01} = -250 \text{ cms}^{-1} (-2.5 \text{ ms}^{-1})$$

$$(ii) \quad t(h_{max}) = \frac{6}{2} = 3 \text{ s}, v = u - gt, u = 10 \times 3 = 30 \text{ ms}^{-1}, h_{max} = \frac{30^2}{2 \times 10} = 45 \text{ m}$$

(iii)



(b) (i) The rate of change of momentum of a body is directly proportional to the resultant external force producing the change, and takes place in the direction of the force

(ii) Increases the time of impact thus reducing the impulsive force

(iii) *momentum before collision = momentum after collision*

$$58 \times 3 = 60 \times v, v = 2.9 \text{ m/s}$$

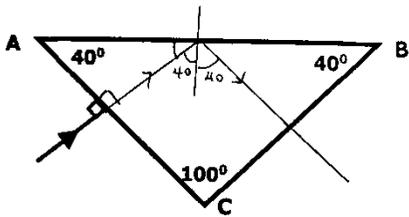
14. (a) The bending of light at the interface when it travels from one medium to another at an angle.

$$(b) \eta = \frac{\sin 42}{\sin 30} = 1.338$$

$$(c) \eta = \frac{c}{v_g} = \frac{3 \times 10^8}{2.4 \times 10^8} = 1.25$$

(d) Light must be travelling from optically denser medium to an optically less dense medium

Angle of incidence must be greater than the critical angle



(e)

16. (a)(i) The meter rule turns anti-clockwise. The iron core becomes magnetized, the end near the magnet becomes south pole attracting the magnet, producing an anti-clockwise moment.

(ii) The meter rule turns in the clockwise direction

(b) Increase the current

Increase the number of turns per unit length

Decrease the length of the core

$$17. (a) (i) P_w = P_m, P = h\rho g, P_m = 13600 \times \frac{67}{100} \times 10 = 91120, 91120 = 1000 \times h \times 10, h = 9.112 \text{ m}$$

(ii) The lift pump uses the atmospheric pressure which can only support 10 m, the force pump has compressed air which exerts more pressure than the atmospheric pressure and hence can work for a well deeper than 10 m.