

B.C.M. SCHOOL BASANT AVENUE DUGRI LDH PB

CLASS-X SUBJECT-SCIENCE

ASSIGNMENT: SOLUTIONS

(PHYSICS)

Q1. Sol:

$$h=20\text{cm } h'=10\text{cm } P=2\text{D}$$

$$f=100/P = 100/2=50\text{cm}$$

$m=h'/h = 10/20=1/2$ which is less than 1 hence image formed will be diminished ie real, inverted and diminished or virtual, erect and diminished. It is possible by both the lenses Concave lens and Convex lens---

Case I Concave lens

$$F=-50\text{cm } m=+1/2$$

$$\frac{1}{2}=v/u$$

$$v= u/2$$

By lens formula

$$1/f = 1/v - 1/u$$

$$-1/50 = 2/u - 1/u$$

$$u=-50\text{cm}$$

Case 2 Convex lens

$$f=+50 \text{ cm } m=-1/2$$

$$-1/2 = v/u$$

$$v=-u/2$$

By lens formula

$$1/f = 1/v - 1/u$$

$$1/50 = -2/u - 1/u$$

$$1/50 = -3/u$$

$$u = -150 \text{ cm}$$

Hence positions of the object will be 50 cm, 150 cm.

Q2. Sol:

$$P = +5 \text{ D}$$

$$f = +20 \text{ cm take } m = \pm 3$$

Case 1 when image is real, inverted magnified

$$\Rightarrow m = -3$$

$$-3 = v/u$$

$$v = -3u$$

By lens formula

$$1/f = 1/v - 1/u$$

$$1/20 = 1/-3u - 1/u$$

$$1/20 = -4/3u$$

$$U = -80/3 \text{ cm}$$

Case 2 when image is virtual, erect magnified

$$m = +3$$

$$3 = v/u$$

$$V = 3u$$

By lens formula

$$1/f = 1/v - 1/u$$

$$1/20 = 1/3u - 1/u$$

$$1/20 = -2/3u$$

$$U = -40/3 \text{ cm}$$

Hence possible positions are $-40/3 \text{ cm}$, $-80/3 \text{ cm}$.

Q3.(a) The relationship $n = (\sin i)/(\sin r)$ is Snell's law of refraction—it states that the ratio of $\sin i$ to $\sin r$ is always constant for a given pair of media.

(b) The coin appears slightly raised above its actual position due to refraction of light.

(c) Observation: The coin will appear to be raised more in a new medium having a refractive index of 1.5.

Reason: Higher the refractive index, more bending of the light rays after refraction.

Thus, the light rays will bend more in new medium ($n = 1.5$) as compared to water ($n = 1.33$)

(CHEMISTRY)

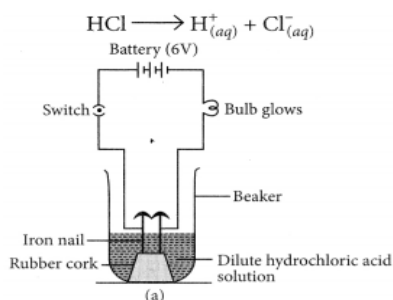
- On adding phenolphthalein to NaOH solution, the colour becomes pink.
 - On adding dilute HCl solution dropwise to the same test tube, the pink colour disappears and the solution again becomes colourless.
 - On again adding NaOH to the above mixture, pink colour reappears because the medium becomes basic again.
- The chemical formula of marble (lime stone) is CaCO_3 . Its chemical name is calcium carbonate.

(b) Taj Mahal, one of the seven wonders of the world situated at Agra, is continuously losing its luster day by day due to rapid industrialisation which causes acid rain.

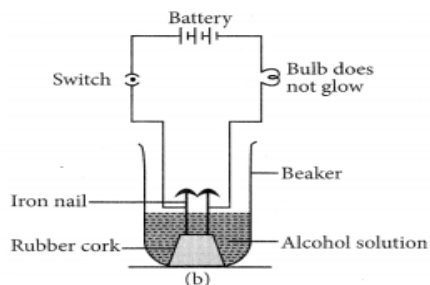
The sulphuric acid present in the acid rain causes the marble (CaCO_3) to be washed off as calcium sulphate (CaSO_4), leading to the deterioration of such a splendid piece of architecture.



3. (a) Take two beakers, one containing HCl acid and other containing alcohol which is not an acid but contains hydrogen. Now, fix two iron nails on a rubber cork and insert in a beaker and connect the nail to the two terminal of 6V battery through a switch and a bulb. Pour some dilute HCl solution in beaker and switch on the current. The bulb starts glowing. This shows that acids get dissociated as H^+ and Cl^- ions and these ions are responsible for conducting electricity.

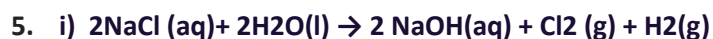


Let us now take alcohol solution in the beaker and switch on the current. The bulb does not glow in this case. This shows that alcohol does not conduct electricity.



So, all acids have hydrogen but all hydrogen containing compounds are not acid.

4. (a) The compound P is calcium phosphate, (b) Eating chocolates and sweets produce large amount of acid in the mouth which is not completely neutralised by the saliva produced in the mouth. Excess acid attacks the enamel and tooth decay starts as pH of the mouth falls below 5.5. The best way to prevent tooth decay is to clean the teeth by using toothpastes after eating food. Toothpastes which are generally basic neutralise the excess acid in the mouth.



ii) At anode Chlorine gas & at cathode hydrogen gas are formed.

iii) Used for water treatment, Disinfectants, PVC, pesticides.

iv) It is formed near the cathode.