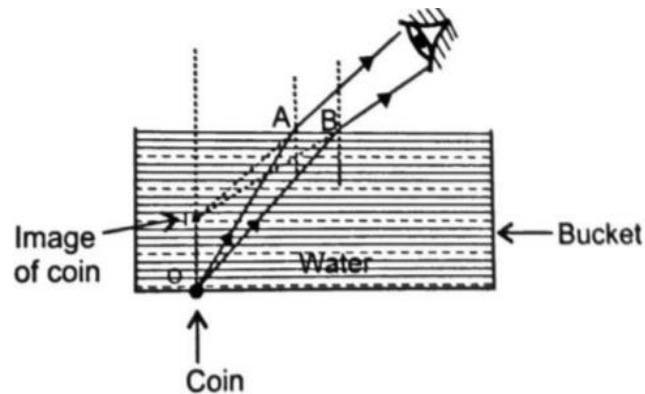## (PHYSICS)

Q1. An object of height 20cm is placed in front of a lens of power 2D , which produce an image of height 10cm. Find (a) the nature and focal length of the lens.

(b) Position/s of the object in front of the lens.

Q2. An object when kept in front of a lens of power +5D , it produce an image thrice the size of the object. Calculate the position(s) of the object from the lens and draw a ray diagram to show the formation of image.

Q3.When the coin is under water, then due to refraction of light, a virtual image of the coin is formed which is slightly above its actual position nearer to water surface as shown in figure.

This is because the light rays coming from coin and then go from water to air, they deviate from their path and get deflected away from the normal Backward extension of these refracted ray appear to meet at point 'I', the image of the coin.

a) State the relationship between angle of incidence and angle of refraction formed by the ray at the point B of water-air interface.

(b) Why does the coin appear raised when kept in water at the bottom of bucket?

(c) The medium is changed from water (refractive index of water = 1.33) to a new medium having refractive index 1.5. State what your observation will be about the

image of the coin in the new medium? Give a reason.

(CHEMISTRY)

1. To. a solution of sodium hydroxide in a test tube, two drops of phenolphthalein are added.
   (i) State the colour change observed.
   (ii) If dil HCl is added dropwise to the solution, what will be the colour change?
   (iii) On adding few drops of NaOH solution to the above mixture the colour of the solution reappears. Why?

2. (a) Write the chemical name and formula of marble.
   (b) It has been found that marbles of Taj are getting corroded due to development of industrial areas around it. Explain this fact giving a chemical equation.

3. Illustrate an activity to investigate whether all compounds containing hydrogen are acidic.

4. A compound P forms the enamel of teeth. It is the hardest substance of the body. It doesn't dissolve in water but gets corroded when the pH is lowered below 5.5.
   (a) Identify the compound P.
   (b) How does it undergo damage due to eating chocolate and sweets? What should we do to prevent tooth decay?

5. **CASE STUDY**

   Sodium hydroxide When electricity is passed through an aqueous solution of sodium chloride (called brine), it decomposes to form sodium hydroxide. The process is called the chlor-alkali process because of the products formed– chlor for chlorine and alkali for sodium hydroxide.

   i)   Write the chemical equation involved in this process?
   ii)   What are the substances that are formed at anode and cathode on chlor- alkali process?
   iii)   What are the uses of chlorine?
   iv)   Where does the sodium hydroxide solution is formed?