

**BOARD OF SECONDARY EDUCATION (TELANGANA)**  
**SUMMATIVE ASSESSMENT – II**  
**TENTH CLASS GENERAL SCIENCE**  
**PHYSICAL SCIENCE MODEL PAPER**  
**PAPER – I (ENGLISH VERSION)**

Time: 2 hrs. 45 mins.

PART – A & B

Maximum Marks: 40

**INSTRUCTIONS:**

- i) In the time duration of 2 hrs. 45 mins. 15 minutes of time is allotted to read and understand the question paper.
- ii) Answer the questions under PART – A in separate answer book.
- iii) Write the answers to the questions under PART – B on the question paper itself and attach it to the answer book of PART – A.

Time: 2 hrs. 15 mins.

PART – A

Marks: 35

**INSTRUCTIONS:**

- i) PART – A comprises of three Sections I, II, III.
- ii) All the questions are compulsory.
- iii) There is no overall choice. However, there is an internal choice to the questions under Section – III.

**SECTION – I**

**INSTRUCTIONS:**

- i) Answer ALL the questions.
- ii) Each question carries ONE Mark.
- iii) Write the answers in 1 – 2 sentences.  $7 \times 1 = 7$

1. The focal length of a convex mirror is 13 cm. What is its radius of curvature?
2. Write an equation which shows the reduction of metallic oxides with Carbon.
3. Which hydrocarbons among alkanes, alkenes and alkynes participate in addition reactions?
4. What colours do you observe when Strontium chloride and Cupric chloride are put to Flame test?
5. Draw the structure of  $H_2O$  molecule.

6.  What does the adjacent figure shows?

7. Mention two uses of Solenoid.

## SECTION - II

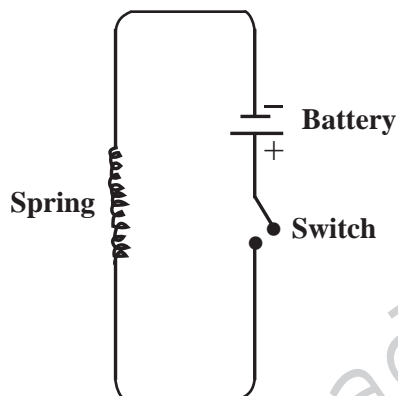
## INSTRUCTIONS:

- i) Answer ALL the questions.
- ii) Each question carries TWO Mark.
- iii) Answer the questions in 4 – 5 sentences.

$$6 \times 2 = 12$$

8. The power of lens is +2D. What kind of lens it is? And what is its focal length?

9.



A spring is suspended as shown in diagram. A battery and switch are connected between the ends of the spring. What happens when the switch is closed? Guess the answer.

10. The gas 'X' which is obtained at the anode during the electrolysis of Sodium chloride solution, produces a compound 'Y' on reacting with dry Calcium hydroxide. The compound 'Y' is used for disinfecting drinking water to make it free of germs.

Name X, Y and write the chemical equation for the reaction between them.

11. Fill the following table with suitable answers.

| Group Number | Name of the Element | Electron Configuration | Block Name | Name of the Family of Element |
|--------------|---------------------|------------------------|------------|-------------------------------|
| II A         | Mg                  |                        |            |                               |
| IV A         | Si                  |                        |            |                               |

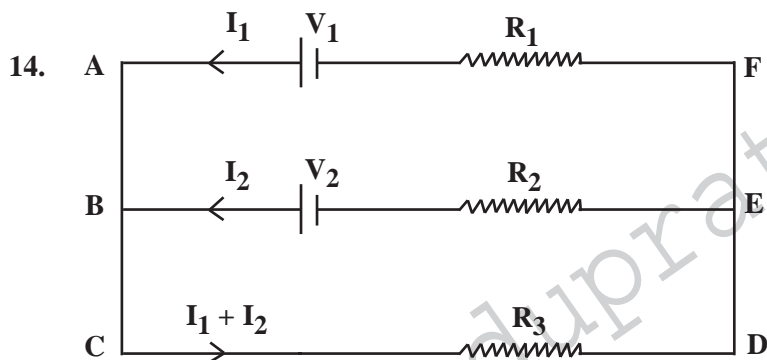
12. Draw a neat diagram of AC generator Name the parts.

13. What are the uses of Bleaching powder.

SECTION - III

INSTRUCTIONS:

- i) Answer ALL the questions.
- ii) Each question carries FOUR Marks.
- iii) There is internal choice for each question only one option from each question is to be attempted.
- iv) Answer each question in 8 – 10 sentences. 4 × 4 = 16

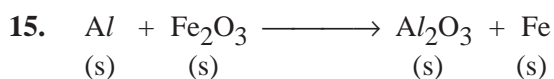


Find the resultant potential difference of the following loops from the given circuit diagram.

- (i) Loop ACDEFA
- (ii) Loop ABEFA
- (iii) Loop CDEBC
- (iv) Loop BCDEB

(OR)

Q: Mention the sign convention for the parameters related to the mirror equation.



(Atomic masses of Al = 27 U, Fe = 56 U, and O = 16 U) then calculate the amount of Aluminium required to get 224 kg of Iron by the above reaction.

(OR)

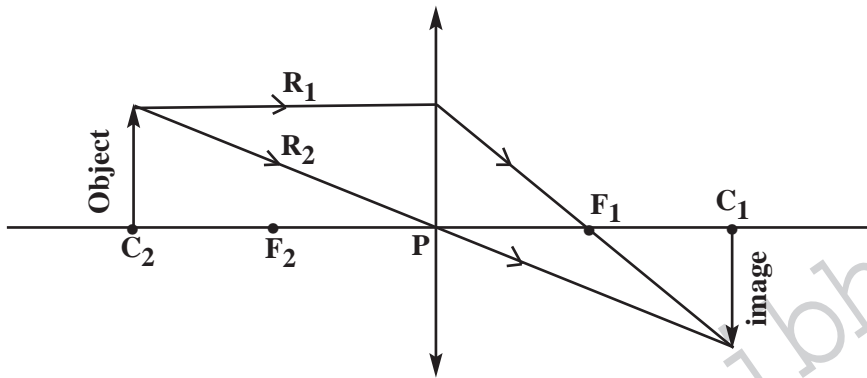
Q: Explain some important reaction with examples that takes place in Carbon compounds.

16. Complete the following table and answer the questions given below.

| Ore     | Bauxite               | Copper Iron<br>Pyrites | Zinc<br>Blende | Epsom<br>Salt        | Horn<br>Silver |                                |
|---------|-----------------------|------------------------|----------------|----------------------|----------------|--------------------------------|
| Formula | $Al_2O_3 \cdot 2H_2O$ | $CuFeS_2$              |                | $MgSO_4 \cdot 7H_2O$ | $AgCl$         | $KCl \cdot MgCl_2 \cdot 6H_2O$ |
| Metal   | Al                    |                        | Zn             | Mg                   |                | Mg                             |

- (i) How many water molecules are there in Epsom salt?
- (ii) Which metals ore is Horn silver?
- (iii) Among the above metals which are available in free state?
- (iv) What is the ore of iron metal?

(OR)



With the help of the above figure, answer the questions.

- i) Name the lens used in the above figure.
  - ii) Explain the nature of image.
  - iii) Out of the two light ray travelling from the object which one is deviated and which is not?
  - iv) To get the image at infinite distance, where should we place the object, convey this by means of a ray diagram.
17. How do you verify experimentally that the focal length of a convex lens is increased when it is kept in water?

(OR)

Write down the process and materials used in the experiment of the reaction of carbonates and metal hydrogen carbonates with acids produces corresponding salt, carbon dioxide gas and water.

## INSTRUCTIONS:

- i) Answer ALL the questions.
- ii) Each question carries  $\frac{1}{2}$  Mark.
- iii) Answers are to be written in question paper only.
- iv) Marks will not be awarded in any case of any over writing and rewriting or erased answers.
- v) Write the CAPITAL LETTER (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

$$10 \times \frac{1}{2} = 5$$

18. Focal length of eye ( )  
 A) 2.0 – 2.20 cm B) 2.0 – 2.27 cm  
 C) 2.27 – 2.5 cm D) 2.27 – 2.8 cm
19. The lens which can form real and virtual images is ( )  
 A) Bi convex B) Bi concave  
 C) Plano Concave D) Plano Convex
20. The resultant of two resistances in series is  $24 \Omega$ . If one of them is  $7 \Omega$ . The resistance of second is ( )  
 A)  $10 \Omega$  B)  $31 \Omega$  C)  $48 \Omega$  D)  $17 \Omega$
21. Identify the wrong set of quantum numbers from the following ( )  
 A)  $n = 1, l = 0, m = 0, s = -\frac{1}{2}$   
 B)  $n = 2, l = 1, m = 0, s = +\frac{1}{2}$   
 C)  $n = 2, l = 2, m = 5, s = -\frac{1}{2}$   
 D)  $n = 2, l = 1, m = 0, s = +\frac{1}{2}$
22. Which one of the molecule is pyramidal? ( )  
 A)  $H_2O$  B)  $HCl$  C)  $CH_4$  D)  $NH_3$
23. The IUPAC name of the compound ( )  
 $CH_3 - CH_2 - \underset{\substack{| \\ CH_3}}{C} = CH_2$  is  
 A) 2 – Methyl butanol  
 B) 2 – Methyl 1 – butene  
 C) 2 – Methyl 2 – butene  
 D) 2 – Methyl butene

24. On mixing aqueous solutions of Barium Chloride and Sodium sulphate we observe that ( )  
A) A white precipitate is formed immediately  
B) A transparent solution is formed  
C) A colourless gas is evolved.  
D) A pungent smelling gas evolves with brisk effervescence.
25. On dissolving acid or base in water, heat .... ( )  
A) Receives  
B) Produces  
C) No Change  
D) Depending on situation
26. The substance used in the bandage of fractured bones is ( )  
A) Gypsum  
B) Bleaching Powder  
C) Calcium Sulphate  
D) Plaster of Paris
27. The mirror used to shave is ( )  
A) Plane mirror  
B) Concave mirror  
C) Convex mirror  
D) None of these



SECTION – II

8. The power of lens is +2D. What kind of lens it is? And what is its focal length?

A:  $\rho = +2D$

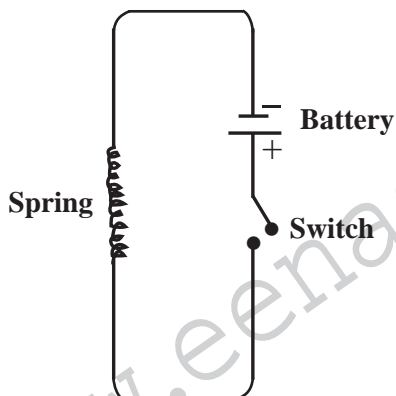
As the power of lens is positive, so it is a convex lens.

$$\rho = \frac{100}{f \text{ (in cm)}}$$

$$2 = \frac{100}{f \text{ (in cm)}}$$

$$f = \frac{100}{2} = 50 \text{ cm.}$$

9.



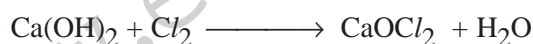
A spring is suspended as shown in diagram. A battery and switch are connected between the ends of the spring. What happens when the switch is closed?

Guess the answer.

- A:
- i) The magnetic field lines set up in the spring.
  - ii) This is known as solenoid.
  - iii) The solenoid behaves like a bar magnet.
  - iv) Hence each ring acts as dipole. So, mutual attraction exists between the rings and spring compresses.

10. The gas 'X' which is obtained at the anode during the electrolysis of Sodium chloride solution, produces a compound 'Y' on reacting with dry Calcium Hydroxide. The compound 'Y' is used for disinfecting drinking water to make it free of germs. Name X, Y and write the chemical equation for the reaction between them.

- A:
- i) 'X' is Chlorine and 'Y' is Bleaching powder.
  - ii) Chemical equation is





11. Fill the following table with suitable answers.

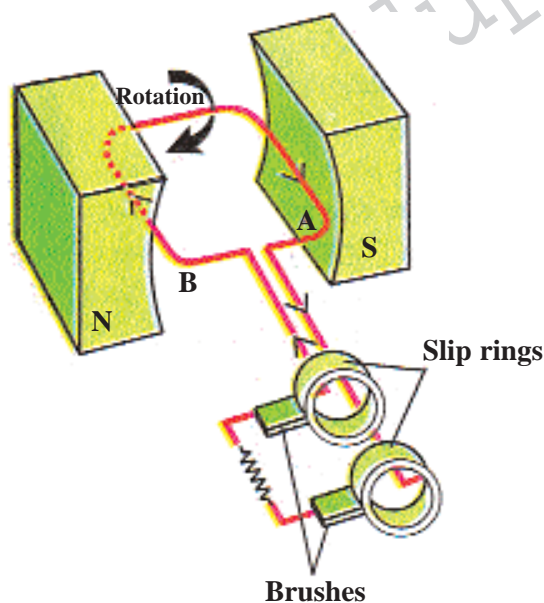
| Group Number | Name of the Element | Electron Configuration | Block Name | Name of the Family of Element |
|--------------|---------------------|------------------------|------------|-------------------------------|
| II A         | Mg                  |                        |            |                               |
| IV A         | Si                  |                        |            |                               |

A:

| Group Number | Name of the Element | Electron Configuration     | Block Name | Name of the Family of Element |
|--------------|---------------------|----------------------------|------------|-------------------------------|
| II A         | Mg                  | $1s^2 2s^2 2p^6 3s^2$      | s – block  | Alkali earth metal family     |
| IV A         | Si                  | $1s^2 2s^2 2p^6 3s^2 3p^2$ | p – block  | Carbon family                 |

12. Draw a neat diagram of AC – generator, Name the parts.

A:

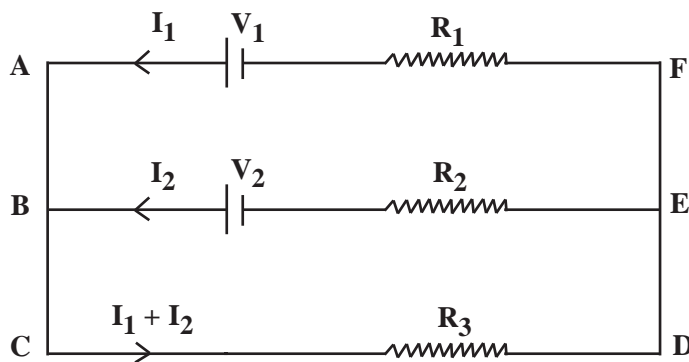


13. What are the uses of Bleaching Powder?

- A:
- i) It is used for bleaching cotton and linen in the textile industry for bleaching wood pulp in paper industry and for bleaching washed clothes in laundry.
  - ii) used as an oxidising agent in many chemical industries.
  - iii) used for disinfecting drinking water to make it free of germs.
  - iv) used as a reagent in the preparation of chloroform.

SECTION - III

14.



Find the resultant potential difference of the following loops from the given circuit diagram.

- (i) Loop ACDF A                      (ii) Loop ABEFA  
 (iii) Loop CDEBC                    (iv) Loop BCDEB

**A:** (i) **For the Loop ACDF A:** The resultant potential difference in the loop ACDF A is

$$- (I_1 + I_2) R_3 - I_1 R_1 + V_1 = 0$$

(ii) **For the loop ABEFA:** The resultant potential difference in the loop ABEFA is

$$- V_2 + I_2 R_2 - I_1 R_1 + V_1 = 0$$

(iii) **for the loop CDEBC:** The resultant potential difference in the loop CDEBC is

$$- (I_1 + I_2) R_3 - I_2 R_2 + V_2 = 0$$

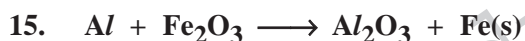
(iv) **For the loop BCDEB:** The resultant potential difference in the loop BCDEB is

$$- (I_1 + I_2) R_3 - I_2 R_2 + V_2 = 0$$

(OR)

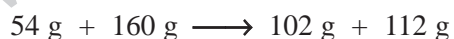
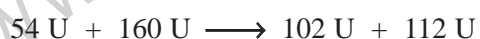
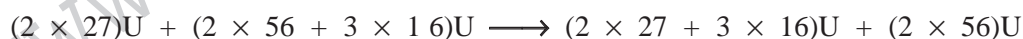
**Mention the sign convention for the parameters related to the mirror equation.**

- A:** (i) All distances should be measured from the pole.  
 (ii) The distances measured in the direction of incident light, to be taken as positive.  
 (iii) The direction opposite to incident light to be taken as negative.  
 (iv) Height of the object ( $h_o$ ) and height of the image ( $h_i$ ) are positive if measured upwards and negative if measured downwards from the axis.



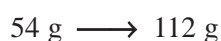
(Atomic masses of Al = 27 U, Fe = 56 U and O = 16 U.)

**Then calculate the amount of Aluminium required to get 224 kg of Iron by the above reaction.**



As per the balanced equation

Aluminium  $\longrightarrow$  Iron



$$x \text{ g} \longrightarrow (224 \times 1000)\text{g}$$

$$\therefore x \text{ g} = \frac{(224 \times 1000) \times 54}{112}$$

$$= (2 \times 1000) \times 54$$

$$= 108000 \text{ g (or) } 108 \text{ kg.}$$

$\therefore$  To get 224 kg of Iron we have to use 108 kg of Aluminium.

(OR)

**Explain some important reactions with examples that takes place in Carbon compounds.**

**A:** Important reactions in organic compounds are

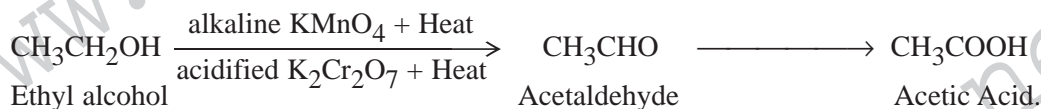
- (i) Combustion reaction                      (ii) Oxidation reactions  
(iii) Addition reactions                      (iv) Substitution reactions

**i) Combustion reaction:** The process of burning of Carbon or Carbon compounds in excess of Oxygen or air to give Carbon dioxide, heat and light is called combustion reaction.

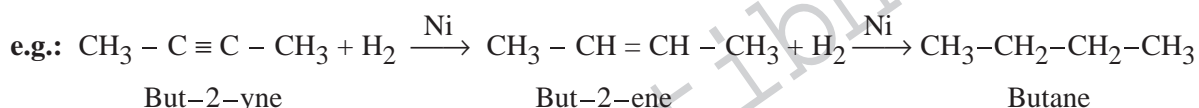


**ii) Oxidation reactions:** Combustion is generally oxidation reaction. Oxidation reactions may be carried out using oxidising agents.

**e.g.:** Ethyl alcohol undergoes oxidation with alkaline  $\text{KMnO}_4$  solution to form acetaldehyde and finally acetic acid.

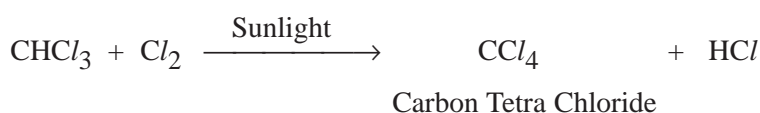
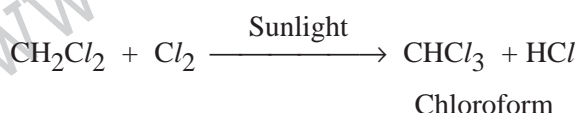
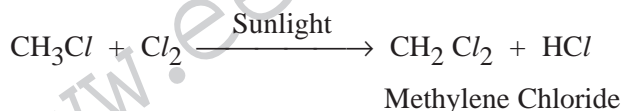


**iii) Addition reactions:** Unsaturated organic compounds contains either double or triple bonds. Unsaturated organic compounds undergo addition reactions to form saturated compounds.



**(iv) Substitution reactions:** A reaction in which an atom or a group of atoms in a given compound is replaced by other atom or group of atoms is called a substitution reaction.

**e.g.:** Methane reacts with Chlorine in the presence of sunlight to form a mixture of Methyl chloride, Methylene chloride, Chloroform and Carbon tetra chloride.



16. Complete the following table and answer the questions given below.

| Ore     | Bauxite               | Copper Iron<br>Pyrites | Zinc<br>Blende | Epsom<br>Salt        | Horn<br>Silver |                                |
|---------|-----------------------|------------------------|----------------|----------------------|----------------|--------------------------------|
| Formula | $Al_2O_3 \cdot 2H_2O$ | $CuFeS_2$              |                | $MgSO_4 \cdot 7H_2O$ | $AgCl$         | $KCl \cdot MgCl_2 \cdot 6H_2O$ |
| Metal   | Al                    |                        | Zn             | Mg                   |                | Mg                             |

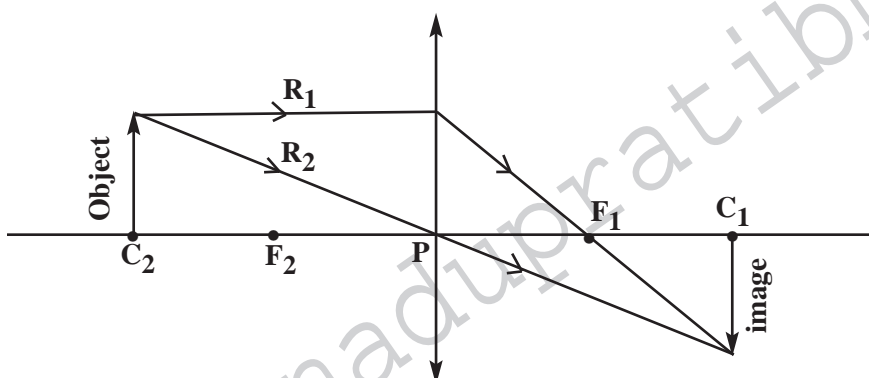
- How many water molecules are there in Epsom salt?
- Which metals ore is Horn Silver?
- Among the above metals which are available in free state?
- What is the ore of Iron metal?

A:

| Ore     | Bauxite               | Copper Iron<br>Pyrites | Zinc<br>Blende | Epsom<br>Salt        | Horn<br>Silver | Carnallite                     |
|---------|-----------------------|------------------------|----------------|----------------------|----------------|--------------------------------|
| Formula | $Al_2O_3 \cdot 2H_2O$ | $CuFeS_2$              | Zns            | $MgSO_4 \cdot 7H_2O$ | $AgCl$         | $KCl \cdot MgCl_2 \cdot 6H_2O$ |
| Metal   | Al                    | Cu                     | Zn             | Mg                   | Ag             | Mg                             |

- 7 water molecules
- Ag
- Ag
- Hematite, Magnetite

(OR)

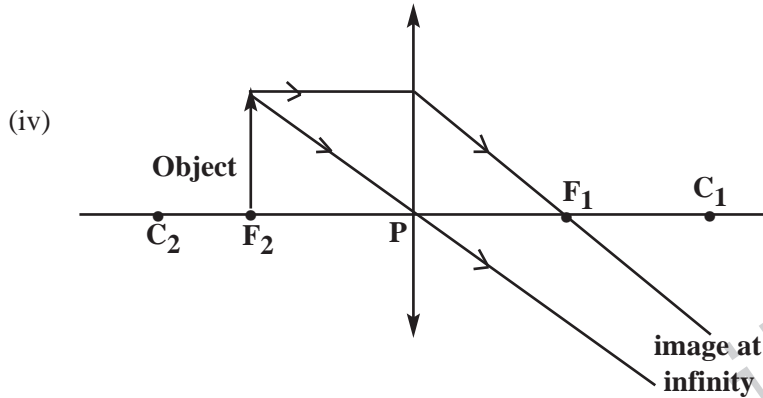


With the help of above figure answer the questions.

- Name the lens used in the above figure.
- Explain the nature of image.
- Out of the two light ray travelling. From the object which one is deviated and which is not?
- To get the image at infinite distance, where should we place the object. Convey this by means of a ray diagram.

- A:
- Convex lens
  - Real, inverted and of the same size as that of object.

(iii)  $R_1$  is deviated but  $R_2$  is not deviated.

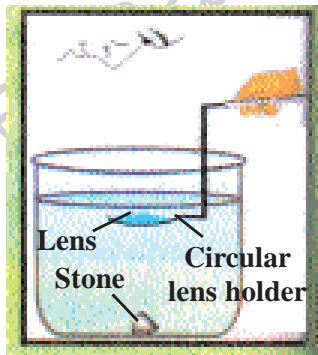


17. How do you verify experimentally that the focal length of a convex lens is increased when it is kept in water?

**A:** **Aim:** To verify change in focal length of a lens when it is dipped in water.

**Apparatus:** Convex lens of known focal length, circular lens holder, tall cylindrical glass tumbler, black stone, water.

**Procedure:**



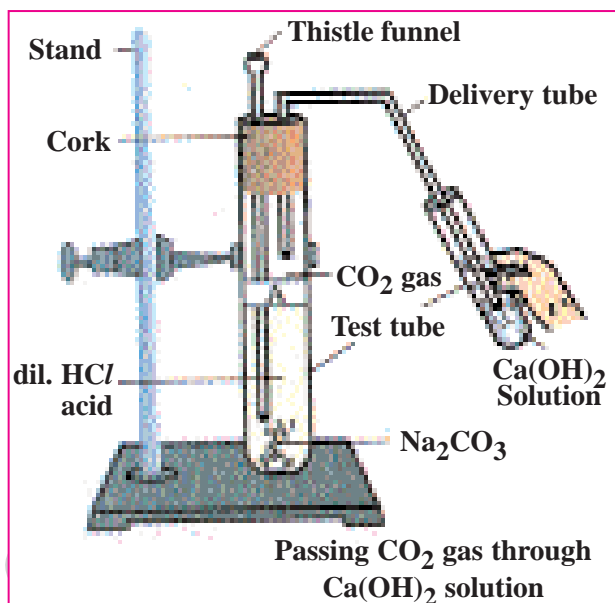
- (i) Take a cylindrical glass tumbler whose height is much greater than the focal length of the lens and fill it with water.
- (ii) keep a black stone at the bottom of the vessel.
- (iii) Now dip the lens into water using circular lens holder such that it is at a distance which is less than or equal to focal length of the lens in air.
- (iv) Now see through the lens to have a view of the stone.
- (v) Increase the height of the lens till you are not able to see the stones image.
- (vi) When the lens is dipped to a height which is greater than the focal length of lens in air we are able to see the image. Showing that focal length of the lens has increased water.
- (viii) Thus we conclude that the focal length of the lens depends upon surrounding medium.

(OR)

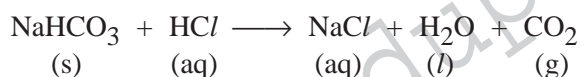
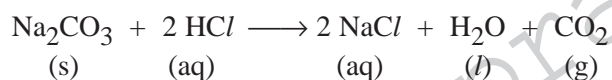
Write down the process and materials used in the experiment of the reaction of carbonates and metal hydrogen carbonates with acids produces corresponding salt, Carbondioxide gas and water.

**A: Required Materials:** Two test tubes, two holed rubber stoppers, Delivery tube, thistle funnel, cork, stand, dilute HCl, Sodium Carbonate, Sodium Hydrogen Carbonate, Ca(OH)<sub>2</sub> Solution.

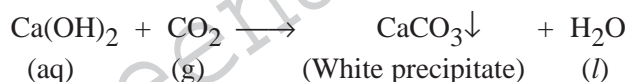
**Procedure:**



- (i) Take two test tubes label them as A and B.
- (ii) Take about 0.5 gm of Sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>) in test tube A and about 0.5 gm of Sodium Hydrogen Carbonate (NaHCO<sub>3</sub>) in test tube B.
- (iii) Add about 2 ml of dilute HCl, to both the test tubes.
- (iv) pass the gas produced in each case through lime water.
- (v) A milky white precipitate is formed. Hence the gas produced is CO<sub>2</sub>.
- (vi) The reactions occurring in the above activities.



- (vii) Pass the gas evolved through lime water.



**Conclusion:** From above activity we conclude that when metal carbonates and hydrogen carbonates react with acids they give corresponding salt, carbondioxide and water.

Metal carbonate + Acid  $\longrightarrow$  Salt + Carbondioxide + Water

Metal Hydrogen Carbonate + Acid  $\longrightarrow$  Salt + Carbondioxide + Water

### PART – B ANSWERS

18-C; 19-A; 20-D; 21-C; 22-D; 23-B; 24-A; 25-B; 26-D; 27-B.

Writer: K. Gagan Kumar