

**Class-10 - KEY SHEET - PART-A**

**Section - I**

**Group -A**

1. **Evaporation** : The process of escaping of molecules from the surface of a liquid at any temperature is called evaporation. Evaporation is a cooling process. It is a surface phenomenon.  
**Boiling** : The process in which the liquid phase changes to gaseous phase at a constant temperature and pressure is called boiling. Boiling does not cause cooling. Boiling is a bulk phenomenon.
2. Harsha may asked the following questions.
- (i) Which mirror it is?
  - (ii) Why the image is smaller?
  - (iii) Why the image appears closer?
  - (iv) Is it plane mirror or not?
3. The light rays from the stars travel through many layers of earth's atmosphere which are having different refractive index values. The rays bent many times and in random directions. As a result, the stars appear twinkling.

4. Lens maker's formula :  $\frac{1}{f} = (n_{ba}-1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

f = Focal length of the lens

$n_{ba} = \frac{n_b}{n_a}$  = Relative refractive index of lens

with respect to surrounding medium

$n_b$  = Refractive index of lens material

$n_a$  = Refractive index of surrounding medium

$R_1$  = Radius of curvature of first surface

$R_2$  = Radius of curvature of second surface

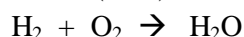
If surrounding medium is air then  $n_a = 1$ , Then

$n_b=n$  is the absolute refractive index of the lens.

Now :  $\frac{1}{f} = (n - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

**Group -B**

5. The reaction between  $H_2$  and  $O_2$  gives water ( $H_2O$ ) molecules.



Balanced equation is  $2 H_2 + O_2 \rightarrow 2 H_2O$

6. When some metals are exposed to moisture, acids, etc., they tarnish due to the formation of respective metal oxide on their surface. This process is called corrosion.

Corrosion can be prevented by shielding the metal surface, painting, oiling, greasing, galvanizing, chrome plating or making alloys.

7. Tooth enamel, made of calcium phosphate is the hardest substance in the body. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth. This acids attack on the enamel. So Tooth decay starts when pH of the mouth is lower than 5.5.

### 8. Uses of Baking Soda (NaHCO<sub>3</sub>):

- i) Baking powder is used in the preparation of bread and cake. Carbon dioxide produced during the reaction causes bread or cake to rise making them soft and spongy.
- ii) Baking soda is also an ingredient in antacids. Being alkaline, it neutralizes excess acid in the stomach and provides relief.
- iii) It is also used in soda-acid fire extinguishers
- iv) It acts as mild antiseptic.

### Uses of Washing soda (Na<sub>2</sub>CO<sub>3</sub>):

- i) Sodium carbonate (washing soda) is used in glass, soap and paper industries.
- ii) It is used in the manufacture of sodium compounds such as borax.
- iii) Washing soda can be used as a cleaning agent for domestic purposes.
- iv) It is used for removing permanent hardness of water.

### Section - II

9. The light ray selects the path which takes least time to travel. This is Fermat principle.

10. Differences between real and virtual images.

	Real image		Virtual image
1	Real image is formed always in front of the mirror.	1	Virtual image is formed always behind the mirror.
2	Image can be obtained on the screen.	2	Image can not be obtained on the screen.
3	It is formed when light converges to a point after reflection or refraction.	3	It is formed when light appears to be diverges from a point after reflection or refraction.
4	It is always inverted.	4	It is always erect.

11. Snell's law :  $n_1 \cdot \sin i = n_2 \cdot \sin r$  (or)  $\frac{n_1}{n_2} = \frac{\sin r}{\sin i}$

12. Coating with Zinc on Iron to protect it from rusting is called Galvanizing.

(or)

Zinc plating on iron articles to protect them from rusting is called Galvanizing.

13. In the given equation

$\Delta$  indicates heating process and  $\uparrow$  indicates a gas is liberated.

14. Due to reaction between HCl and NaOH, NaCl salt solution is formed.

The P<sup>H</sup> of the solution is 7.

### Section - III

#### Group -A

15. Final temperature as per Method of mixtures :  $(T) = \frac{m_1 T_1 + m_2 T_2}{m_1 + m_2}$

Problem :  $m_1 = 100$  units

$T_1 = 90^\circ\text{C}$

$m_2 = 200$  units

$T_2 = 60^\circ\text{C}$

Final temperature as per Method of mixtures :  $(T) = \frac{m_1 T_1 + m_2 T_2}{m_1 + m_2}$   
 $= \frac{100 \times 90 + 200 \times 60}{100 + 200}$

$$= \frac{9000 + 12000}{300}$$

$$= \frac{21000}{300}$$

$$= 70^\circ\text{C}$$

## 16. Concave mirror

Sl. No	Place of object before concave mirror	Place of image	Nature of image Real/ virtual
1	Between F and C	Beyond C	real
2	At C	At C	real
3	At F	At infinite distance	real
4	Beyond C	Between F and C	real

17. Mirage is an optical illusion where it appears that water has collected on the road at a distant place but when we get there, we don't find any water.

The formation of a mirage is the best example where refractive index of a medium varies throughout the medium.

During a hot summer day, air just above the road surface is very hot, acts as rarer medium. And the air at higher altitudes is cool, acts as denser medium.

Thus the refractive index of the cooler air at the top is greater than the refractive index of hotter air just above the road.

When the light from a tall object such as tree passes through a medium just above the road, whose refractive index decreases towards ground, it suffers, refraction and takes a curved path because of total internal reflection.

Hence we feel the illusion of water being present on road which is the virtual image (mirage) and an inverted image of tree on the road.

18. Spherical mirrors play an important role in our day to day life.

(i) We can get different sizes of images and at desired distances by spherical mirrors.

(ii) Spherical mirrors, which converge light at a point used in solar appliances.

(iii) Concave mirrors are used by ENT doctors to see the affected parts more visible.

(iv) Spherical mirrors are used in wars in olden days to destroy the ships.

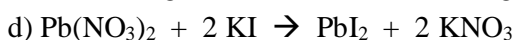
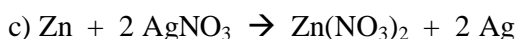
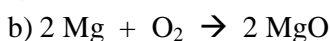
(v) Concave mirrors are used to see celestial bodies.

(vi) Convex mirrors are used as rear view mirrors.

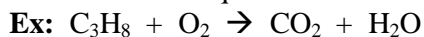
So, I appreciate the role of spherical mirrors in daily life.

### Group -B

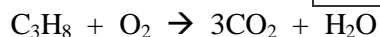
19. The balanced chemical equations are:



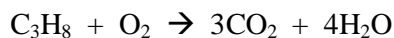
20. Let us take the equation for burning of Propane with oxygen.



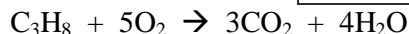
Element	Number of atoms on	
	L.H.S.	R.H.S
C	3	1
H	8	2
O	2	3



Element	Number of atoms on	
	L.H.S.	R.H.S
C	3	3
H	8	2
O	2	7



Element	Number of atoms on	
	L.H.S.	R.H.S
C	3	3
H	8	8
O	2	10

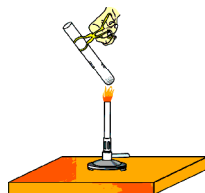


Element	Number of atoms on	
	L.H.S.	R.H.S
C	3	3
H	8	8
O	10	10

21. A, B, C and D substances have  $\text{P}^{\text{H}}$  values 1, 6, 7 and 8 respectively.

Sl No	Type	Substance	$\text{P}^{\text{H}}$
1	Neutral substance	C	7
2	Strong Acid	A	1
3	Weak Base	D	8
4	Weak Acid	B	6

22. **Water crystallization:** The water molecules which form part of the structure of a crystal are called water of crystallization. The salts which contain water of crystallization are called hydrated salts.



**Activity:** Take a few crystals of copper sulphate in a dry test tube and heat the test tube.

In the above activity copper sulphate crystals which seem to be dry contain the water of crystallization.

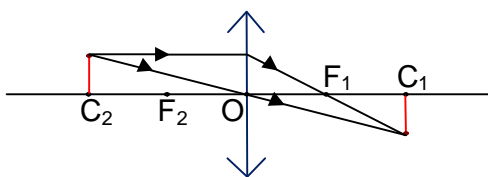
When these crystals are heated, water present in crystals is evaporated and the salt turns white.

When the crystals are added with water, the blue colour reappears.

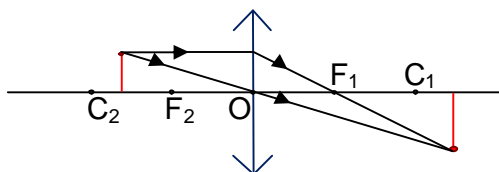
#### Section - IV

23. **Convex lens:**

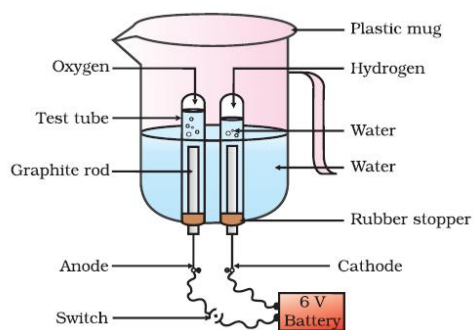
(i) If object is placed at centre of curvature on the principal axis of a convex lens, the image will be collected at centre of curvature on other side.



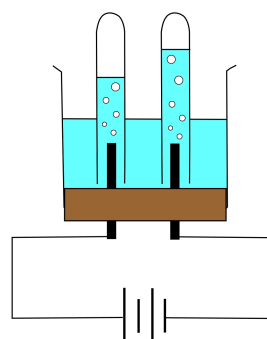
(ii) If object is placed at between centre of curvature and Focus on the principal axis of a convex lens, the image will be collected beyond centre of curvature on other side.



## 24. Formation of image in plane mirror:



(OR)



## KEY SHEET - PART-B

SI No.	Ans.	SI No.	Ans.	SI No.	Ans.
1	A or C or D	11	B	21	humidity
2	B	12	D	22	Radius of curvature
3	B	13	C	23	convex
4	C	14	B	24	reduction
5	B	15	B	25	<i>red</i>
6	D	16	B	26	E
7	B	17	D	27	D
8	C	18	C	28	A
9	A	19	B	29	C
10	C	20	D	30	B