

**PRAKASAM DISTRICT COMMON EXAMINATION BOARD**

**QUARTERLY EXAMINATIONS-OCTOBER-2015**

**GENERAL SCIENCE , Paper – I**

(Physical Sciences)

(English Version)

Time:  $2\frac{1}{2}$  Hours

Parts A and B

Maximum Marks : 50

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

**Section - I**

**Group -A**

- The temperature of the cold soft drink bottle is less than the temperature of atmosphere. The molecules present in air touches the surface of the bottle and lose their kinetic energy. As a result the temperature of water molecules decrease and condense on the surface of the bottle. These water droplets are seen as dew.
- Spherical mirrors play an important role in our day to day life.
  - We can get different sizes of images and at desired distances by spherical mirrors.
  - Spherical mirrors, which converge light at a point used in solar appliances.
  - Concave mirrors are used by ENT doctors to see the affected parts more visible.
  - Spherical mirrors are used in wars in olden days to destroy the ships.
  - Concave mirrors are used to see celestial bodies.
  - Convex mirrors are used as rear view mirrors.

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

- The light rays from the stars travel through many layers of earth's atmosphere which are having different refractive index values. The rays bend many times and in random directions. As a result, the stars appear twinkling.

4. Refractive index of glass relative to water is  $n_{gw} = \frac{n_g}{n_w} = \frac{9}{8}$

Refractive index of water relative to glass is  $n_{wg} = \frac{n_w}{n_g} = \frac{8}{9}$

(or)

Refractive index of glass relative to water =  $\frac{9}{8}$

Refractive index of water relative to glass =  $\frac{1}{\text{Refractive index of glass relative to water}} = \frac{1}{(9/8)} = \frac{8}{9}$

**Group -B**

- Balanced chemical equations
  - $\text{Zn} + 2 \text{AgNO}_3 \rightarrow \text{Zn(NO}_3)_2 + 2 \text{Ag}$
  - $\text{H}_2 + \text{Cl}_2 \rightarrow 2 \text{HCl}$
- Some reactions of Oxidation in our daily life :
  - Rusting of iron
  - Tarnishing of silver
  - Tarnishing of copper
  - Burning of crackers
  - Spoiling of food items
  - .....
- 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. These acids attack on the enamel. So Tooth decay starts when the pH of the mouth is lower than 5.5.

8. Calcium Sulphate hemi hydrate ( $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ ) is called Plaster of Paris.

**Uses of Plaster of Paris :**

- (i) This is used as plaster for fractured bones.
- (ii) This is used for making toys.
- (iii) This is used as decoration material
- (iv) This is for making ceiling to the roof in houses.
- (v) This is used for making Statues.

**Section - II**

9. Tungsten has more resistance . So it is used as filament in the bulb.

10. **Critical Angle :** (any one answer)

- (i) For which incident angle, the angle of refraction is  $90^\circ$  then the incident angle is called critical angle.
- (ii) If angle of refraction is  $90^\circ$ , the incident angle is called Critical angle.
- (iii) If  $r = 90^\circ$  then  $i$  is called Critical angle in refraction.
- (iv) If the refracted ray travels along the interface, the incident angle is called Critical angle.

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. The substances which prevent oxidation are called Antioxidants.

(or)

The substances which reduce the process of oxidation are called antioxidants.

(or)

The substances which slows down the process of oxidation are called antioxidants.

13. Formula of bleaching Powder is  $\text{CaOCl}_2$

14. 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.

**Section - III**

**Group -A**

15. **Melting :** The process in which the solid phase changes to liquid phase at a constant temperature and pressure is called melting.

Ex: If we provide heat to ice , it melts and converts to water in liquid state.

**Latent heat of fusion :** The heat energy required to change one gram of solid to liquid at constant temperature is called latent heat of fusion.

$$\text{Formula : } L_f = \frac{Q}{m}$$

While ice turns to water, the temperature remains constant. the heat provided is utilized to change phase.

The latent heat of fusion of ice is 80 cal/gm.

16. Distance of the object ( $u$ ) = - 10cm

Radius of curvature ( $R$ ) = -8cm

$$\text{Focal length (f)} = \frac{R}{2} = \frac{-8}{2} = -4\text{cm}$$

Distance of the image ( $v$ ) = ?

$$\text{Formula : } \frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$

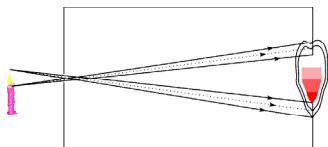
$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-4} - \frac{1}{-10} = \frac{1}{-4} + \frac{1}{10} = \frac{-10+4}{40} = \frac{-6}{40} = \frac{-3}{20}$$

$$v = \frac{-20}{3} = -6.6 \text{ cm ( on the object side)}$$

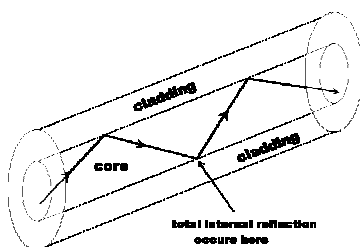
17. Take two barrels or boxes so that one can be immersed through another. Place a dark, thick black paper at one end of the big barrel, and tie it with rubber band. Make a hole with pin at the centre of the paper. Tie a oiled paper which is semi transparent to the second small barrel.

Immerse small barrel into big barrel and observe the flame of the candle. The light which comes from the top of the flame goes straight towards the bottom of the screen. Similarly the rays from the bottom of the flame goes straight towards the top of the screen. This leads to the formation of an inverted image.

If we increase the size of the pin hole camera, we get blurred image with big size. If the size of the hole is equal to the size of the flame , we get no image on the screen.



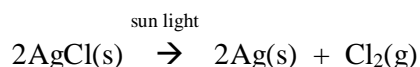
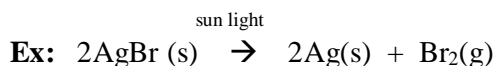
18. **Working of Optical fibres :** Total internal reflection is the basic principle behind working of optical fibre. An optical fibre is very thin fibre made of glass (or) plastic having radius about a micrometer ( $10^{-6}\text{m}$ ). A bunch of such thin fibres form a light pipe. Because of the small radius of the fibre, light going into it makes a nearly glancing incidence on the wall. The angle of incidence is greater than the critical angle and hence total internal reflection takes place. The light is thus transmitted along the fibre.



- Uses of Optical fibres:** (i) The doctor inserts an optical fiber pipe into the stomach through the mouth. Light is sent down through one set of fibres in the pipe. This illuminates the inside of the stomach. The light from the inside travels back through another set of fibres in the pipe and the viewer gets the image at the outer end (generally fed to the computer screen).  
(ii) The important use of fibre optics is to transmit communication signals through light pipes. For example, about 2000 telephone signals, appropriately mixed with light waves, may be simultaneously transmitted through a typical optical fibre.

### Group -B

19. The reactions occur in the presence of sunlight is called photo chemical reactions.



20. The given chemical equation is  $2\text{Cu} + \text{O}_2 \rightarrow 2\text{CuO}$

From this equation we came to know that

(i) Cu and  $\text{O}_2$  are the reactants (which participate in reaction)

(ii) CuO is the product (which is formed due to reaction)

(iii) This is chemical combination reaction

(iv) 2 moles of copper reacts with 1 mole of oxygen and forms 2 moles of copper oxide.

(v) This is oxidation reaction (Copper is oxidized)

(vi) This is a reduction reaction (Oxygen is reduced)

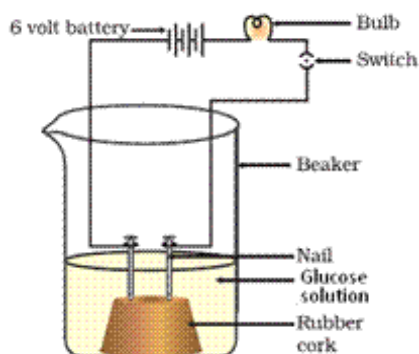
(vii) .....

PKM-SA-1  
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21. Prepare solutions of glucose, alcohol. Connect two different coloured electrical wires to graphite rods separately in a 100 ml beaker. Connect free ends of the wire to 6 volts battery through a bulb & a switch. Make a circuit. Now pour some dilute HCl in the beaker and switch on the current. Repeat activity with dilute sulphuric acid and glucose and alcohol solutions separately.

We will notice that the bulb glows only in acid solutions but not in glucose and alcohol solutions. Glowing of bulb indicates that there is flow of electric current through the solution. Acid solutions have ions and the movement of these ions in solution helps for flow of electric current through the solution. Alcohol and glucose contains hydrogen but not dissociates hydrogen ion in their aqueous solutions. So they are not categorized as acids.

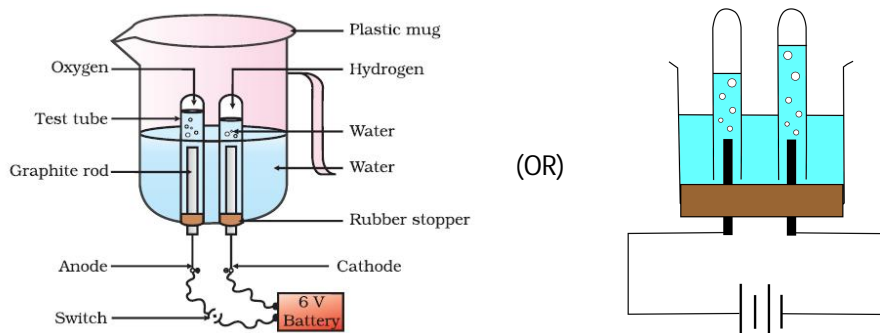


22. The chemical that are obtained from common salt are as follows.

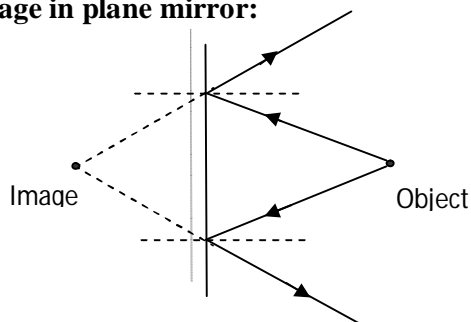
S.No	Chemical Name	Formula
1	Sodium hydroxide	NaOH
2	Baking Soda	NaHCO <sub>3</sub>
3	Washing Soda	Na <sub>2</sub> CO <sub>3</sub>
4	Bleaching Powder	CaOCl <sub>2</sub>

### Section - IV

23. Electrolysis of water:



24. Formation of image in plane mirror:



## KEY SHEET - PART-B

Sl No.	Ans.	Sl No.	Ans.	Sl No.	Ans.
1	C	11	D	21	273
2	A or B	12	*	22	Pierre di Fermat
3	B	13	B	23	Concave
4	D	14	B	24	$3 \times 10^8$ m/s $3 \times 10^5$ Km/s 300000 Km/s
5	C	15	B	25	$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$
6	D	16	B	26	D
7	A	17	A or D	27	A
8	A	18	B	28	B
9	B	19	C	29	E
10	C	20	B	30	C