PRAKASAM DISTRICT COMMON EXAMINATION BOARD
PRE PUBLIC EXAMINATIONS-FEBRUARY-2015
GENERAL SCIENCE , Paper – I
(Physical Sciences)

(English Version)

Time: 2½ Hours   **Parts A and B**   **Maximum Marks : 50**

Class-10 - KEY SHEET - PART-A
Section - I
Group -A

1. If specific heat is high, the rate of rise or fall in temperature is low. So watermelon takes long time to rise in its temperature. Hence Watermelon brought out from a fridge retains its coolness for a long time than other fruits. Because the watermelon consists of more water and water has greater specific heat value.

2.

	Convex Mirror		Concave Mirror
1	This is a spherical mirror whose reflecting surface is curved outward is called convex mirror.	1	This is a spherical mirror whose reflecting surface is curved inward is called called concave mirror.
2	The focus lies behind the mirror.	2	The focus lies infront of the mirror.
3	It is also known as diverging mirror.	3	It is also known as converging mirror.
4	It always forms virtual images.	4	It can form virtual and also real images.
5	It always forms small images.	5	It can forms different size images.
6	It always forms erect images.	6	It can form erect and also invert images.
7	It always forms image behind the mirror.	7	It can form image behind and also infront of the mirror.

3. White paper has some refractive index. Oil has also some refractive index. The paper is made up of very tiny fibers. There are small gaps between fiber molecules. If we make the paper stained with oil, the oil occupies the gaps in the papers. If the refractive indices of both paper and oil are exactly equal, then it becomes transparent. Generally oil paper is translucent.

4. Applications of Faraday's law of electromagnetic induction:
  (i) This law was used in security sys tems in air port s, railway stations and in Govt. institutions.
  (ii) The tape recorder which we use to listen to songs (or) record voices works on the principle of electromagnetic induction.
  (iii) The principle of electromagnetic induction in the case of using ATM card when its magnetic strip is swiped through a scanner.
 (iv) An induction stove works on the principle of electromagnetic induction.

Group –B

5. Keeping food in air tight containers helps to slow down the oxidation process. If food items are kept in air tight bags, then the item does not react with oxygen. So they do not spoil.

6. Uses of Plaster of Paris:
  (1) Plaster of paris is used for making toys.
  (2) It is used for making materials for decoration and for making surfaces smooth.
  (3) It is used for ceiling the roof in houses to protect from heat.
  (4) It is used as plaster for fractured bones.
  (5) It is used in manufacture of Gypsum.

7.
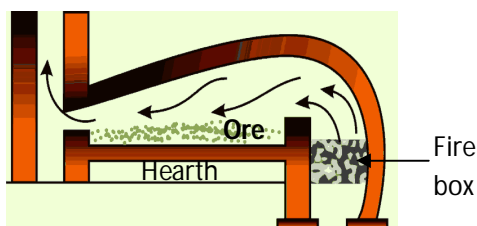
8. 5,6- di chloro, Oct, 6,7- di en, 1,2 di ol


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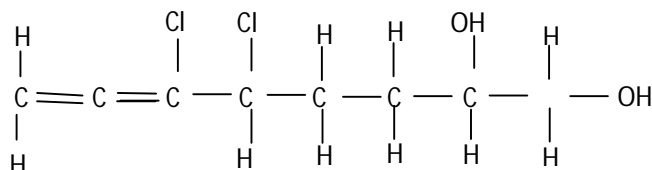
Section - II

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9. The quantity of heat energy required to change unit mass of substance from a solid state to liquid state, without rising in temperature is called Latent heat.

10. The reciprocal of focal length is called power of lens. The unit of power is dioptre.

11. Kirchhoff,s Junction law.

12. $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

13. Principal Quantum number gives the size and energy of an orbit.

14. The impurities present in the ore is called gangue.

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Section - III
Group -A

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15. Take a circular metal disc. Cover with white chart. Mark one line as NN which is normal to the another line marked as MM. Here MM represents the line drawn along the interface of two media and NN represents the normal drawn to this line at 'O'. Take a protractor and place it

along NN (its centre coincides with O). Then mark the angles from $0°$ to $90°$ on both sides of the line NN. Repeat the same on the other side of the line NN. Arrange two straws at the centre of the disc in such a way that they can be rotated freely about the centre of the disc. Adjust one of the straws to make an angle 10^0 with the normal NN (angle of incidence). Immerse half of the disc vertically into the water, filled in a transparent vessel. (MM coincides the surface of the water)
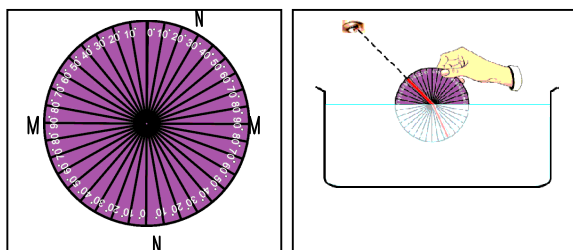
From the top of the vessel try to view the straw which is inside the water. Then adjust the other straw which is outside the water until both straws appear to be in a single straight line. Then take the disc out of the water and observe the two straws on it. We find that they are not in a single straight line.

Measure the angle between the normal and second straw. (angle of refraction). Note down the angle of incidence and angle of refraction in the table. Do the same for various angles like$15°$, $20°$, $25°$, $30°$, $35°$ and $40°$. Find the corresponding angles of refraction and note them.

Sl. No.	(i)	(r)
1	10°	
2	15°	
3	20°	
4	25°	
5	30°	
6	35°	
7	40°	

We observed that the angle of refraction(r) is always greater than the angle of incidence (i).

16. Let the centre of curvatures of convexo-concave lens are R_1 and R_2

Given that $\qquad R_2 = 2R_1$

Focal length of lens (f) = 24cm

Refractive index of the lens (n) = 1.5

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

for convexo-concave lens

$\qquad R_1$ is positive and R_2 is positive.

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

➔ $\frac{1}{24} = (1.5-1)\left(\frac{1}{R_1} - \frac{1}{2R_1}\right)$

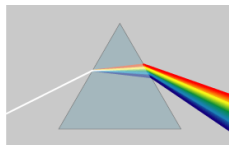➔ $\frac{1}{24} = (0.5)\left(\frac{2-1}{2R_1}\right)$

➔ $2R_1 = 12$ ➔ $R_1 = 6$cm

$\qquad\qquad R_2 = 2R_1 = 12$cm

17. :<u>Formation of artificial rainbow:</u>

Activity-1: Take a prism before a white wall. Keep a light source such that the light rays fall on the prism through a narrow slit which was arranged. Adjust the prism such that the colours (VIBGYOR) fall on the wall.

Activity-2: Take a metal tray and fill it with water. Place a mirror in water such that it makes an angle to the water surface. Keep a white card board screen/sheet above the water surface. Now focus white light on the mirror through water. Try to obtain the colours on the screen. We can see the seven colours (VIBGYOR) of rainbow on the screen.
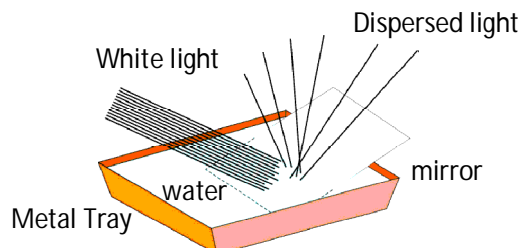
We can place the water tray with mirror inside in sunlight to produce rainbow on wall.

18. Let R_1, R_2 and R_3 resistances connected in parallel combination. The current through them is i_1, i_2 and i_3 respectively. The total voltage difference is V is fixed in this circuit.

Ohm's law : $V = iR$ ➔ $i = \dfrac{V}{R}$

Apply Ohm's law for R_1 resistance , then $i_1 = \dfrac{V}{R_1}$

Apply Ohm's law for R_2 resistance , then $i_2 = \dfrac{V}{R_2}$

Apply Ohm's law for R_3 resistance , then $i_3 = \dfrac{V}{R_3}$

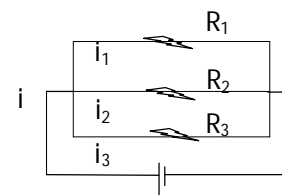If the total current in the circuit is 'i' then $i = i_1 + i_2 + i_3$

$$i = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

The total voltage difference is V. Let the resultant resistance is R, then $i = \dfrac{V}{R}$

$$\frac{V}{R} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

The reciprocal of the resultant resistance is equal to the sum of the reciprocals of the individual resistances.

Group -B

19. Prepare solutions of glucose, alcohol, hydro chloric acid and sulphuric acid etc.,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.
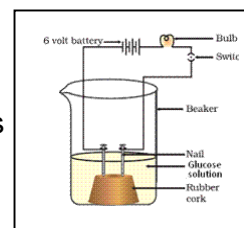
Now pour some dilute HC*l* in the beaker and switch on the current. Repeat activity with dilute sulphuric acid and glucose and alcohol solutions separately. We will notice that the bulb glows only in acid solutions but not in glucose and alcohol solutions. Glowing of bulb indicates that there is flow of electric current through the solution. Acid solutions have ions and the moment 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.

20. (a) Variation of atomic radius:

(i) In periods, as the atomic number increases the atomic radius decreases from left to right.

(ii) In groups, as the atomic number increases the atomic radius increases from top to bottom.

(b) Variation of Ionization potential:

(i) In periods, Ionization potential do not follow any regular trend from left to right. But finally it increases.

(ii) In groups, Ionization potential decreases from top to bottom.

(c) Variation of Electron affinity:

(i) In periods, as the atomic number increases electron affinity increases.

(ii) In groups, as the atomic number increases electron affinity decreases.

(d) Variation of Electro Negativity:

(i) In periods, Electro Negativity increases from left to right.

(ii) In groups, Electro Negativity decreases from top to bottom.

21.

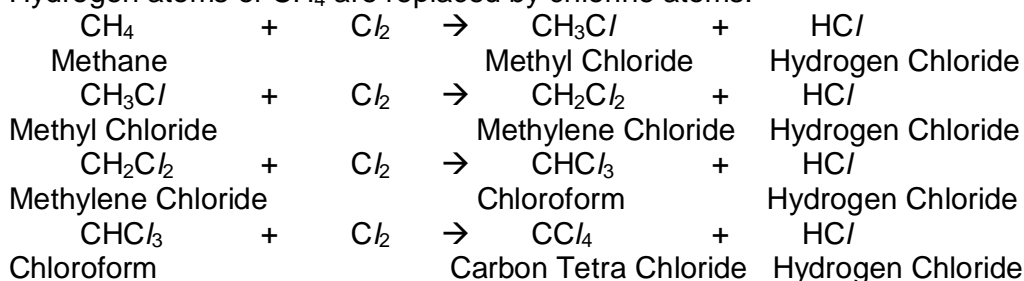|	Ionic compounds		Covalent compounds
1	The are formed due to ionic bond	1	These are formed due to covalent bond
2	They have high melting points.	2	They have low melting points.
3	They have high boiling points.	3	They have low boiling points.
4	These are in crystalline structure.	4	These have different shapes.
5	They are good electric conductors in their aqueous solutions.	5	They are poor electric conductors in their aqueous solutions.
6	They are good heat conductors.	6	They are poor heat conductors.
7	They ionize quickly in water.	7	They does not ionize in water.
8	Ex: NaCl, KCl	8	Ex: H_2O, NH_3

22. Substitution reactions in Alkane:

Alkanes are saturated hydrocarbons. So they participate in 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.

Alkanes undergo some chemical changes under suitable conditions which are Substitution reactions.
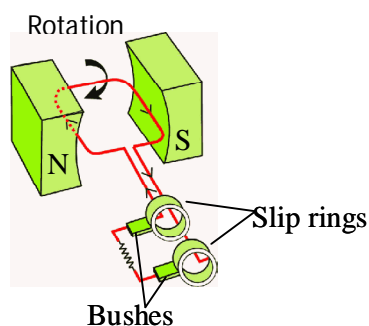
Ex: Methane (CH_4) reacts with chlorine in the presence of sunlight.

Hydrogen atoms of CH_4 are replaced by chlorine atoms.

$$CH_4 \quad + \quad Cl_2 \quad \rightarrow \quad CH_3Cl \quad + \quad HCl$$
Methane   Methyl Chloride   Hydrogen Chloride

$$CH_3Cl \quad + \quad Cl_2 \quad \rightarrow \quad CH_2Cl_2 \quad + \quad HCl$$
Methyl Chloride   Methylene Chloride   Hydrogen Chloride

$$CH_2Cl_2 \quad + \quad Cl_2 \quad \rightarrow \quad CHCl_3 \quad + \quad HCl$$
Methylene Chloride   Chloroform   Hydrogen Chloride

$$CHCl_3 \quad + \quad Cl_2 \quad \rightarrow \quad CCl_4 \quad + \quad HCl$$
Chloroform   Carbon Tetra Chloride   Hydrogen Chloride

Section - IV

23. A.C.Generator:

24. d-orbitals:

KEY SHEET - PART-B

Sl No.	Ans.	Sl No.	Ans.	Sl No.	Ans.
1	D	**11**	A	**21**	15 cm
2	C	**12**	C	**22**	non ohmic
3	B	**13**	D	**23**	Tesla (or) Wb/m^2
4	A	**14**	C	**24**	calcination
5	A	**15**	B	**25**	But, 2-yn, e
6	B	**16**	A	**26**	b
7	C	**17**	A	**27**	e
8	D	**18**	B	**28**	d
9	B	**19**	C	**29**	c
10	D	**20**	D	**30**	a
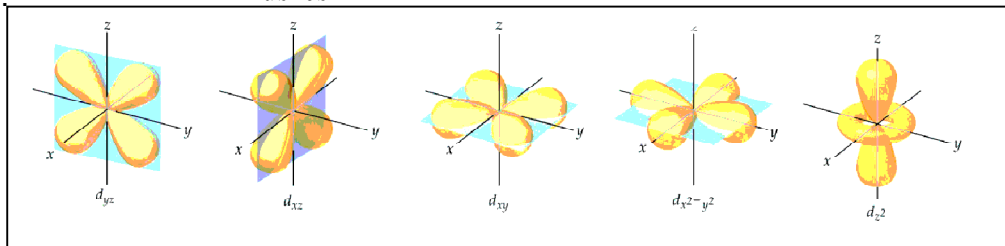
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