Dr.K.K.R GOWTHAM [E.M] HIGH SCHOOL :: GUDIVADA

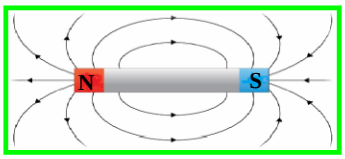
Class : X **PRE-FINAL EXAMINATION** Time : 2.45 Min

Sub : Physical Science **Key** Marks : 50 M

Section - I

I. Answer the following questions **12×½ =6 M**

1) VIBGYOR colours / dispersion of light 2) 90^0

3) 

4) Retina 5) What is the formula of Refractive index ? 6) 273+20=293K

7. Storing of Plaster of Paris :
   1) Plaster of Paris is a white powder.
   2) It easily absorbs water in air and forms hard gypsum.
   3) So, it should be stored in a moisture-proof container.
8. The valency of 13th group elements is 3.
   The valency of 16th group elements is 2.
   The formula of compound is
9. (i) Mg or ✓Na (ii) ✓Li or O (iii) ✓Br or F (iv) ✓K or Br

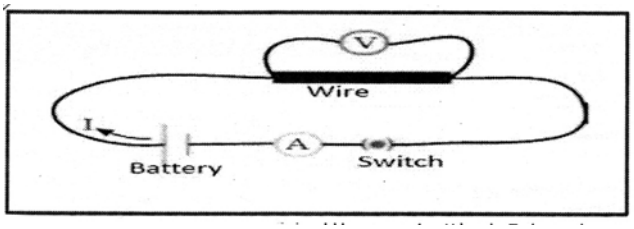
10. The three metals that are found in nature in uncombined form are
    1) Gold 2) Silver 3) Platinum.
11. The simplest hydrocarbon is alkane called Methane (CH_4). It's an aliphatic, saturated compound of Hyrogen and Carbon.
12. The Planck's constant value is 6.625×10^{-27} erg . sec or 6.625×10^{-34} J. sec.

Section - II

II. Answer the following questions **8×1 =8 M**

13. Lens formula $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$ where f=Focal length u = object distance v=image distance
14. Lens power = 4D
    $P=\frac{100}{f}\Rightarrow f=\frac{100}{4}=25cm.$ focal length of the lens (f) = 25cm.
15. Lenz's law : The induced current setup in the coil is in such a direction that it opposes the changes in the flux.

16



17. 1) The two elements which have chemical properties similar to Magnesium are Beryllium and Calcium.

2) The basis for my expectation is that they belong to same group as we know elements belonging to same group have similar properties.

18. **Examples for corrosion :**

1) The rusting of iron (Iron oxide)
2) Tarnishing of silver (Silver sulphide)
3) Development of green coating on copper (Copper carbonate) and bronze.

19. 1) Ethyne when burnt in the presence of oxygen gives enough heat that can be used for welding.

2) Whereas if it is burnt in air which contains nitrogen, CO_2 and other inactive gaseous contents, sufficient oxygen is not available for burning ethyne to give the required heat.

20. Acetic acid is present in vinegar.

Section - III

III. Answer the following questions **8×2 =16 M**

21. Diamond exhibits the property of total internal reflection. Due to its high refractive index and low critical angle 24.4^0. So diamond shine.

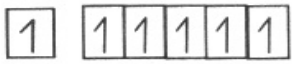
22. 1. Describe the magnetic flex lines within a magnet?
2. How is the magnetic flex outside the magnet ?

23. **Electric motor** – it is a device which converts the electric energy into mechanical energy.
Principle – When current carrying conductor placed in a magnetic field experiences a force. The direction of force is given by Fleming's left hand rule.
Apparatus required - Split rings (commutator), Brushes , two magnets.

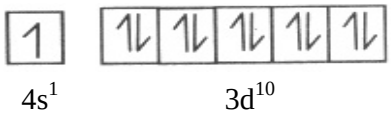
24. 1. When a watermelon is removed from a fridge in a hot day it remains its coolness for a longtime.
2. Because of the curry inside the samosa contains ingredients has higher specific heat values.
3. Because water has greater specific heat values water is used as moderator in nuclear reactor.

25. 1) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$ 2) 3 3) VII A or 17 4) Halogen family 5) 7
6) 1 7) Non-metal

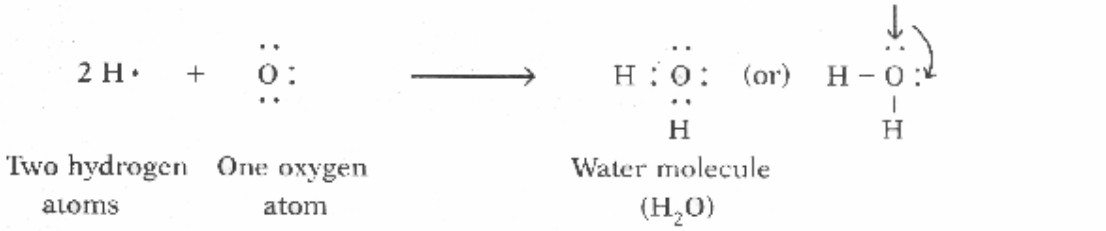
26. 1) In any atom the extra stability obtained when degenerate orbitals are half-filled or ccompletely filled. In Cr $3d^5$ is half-filled because the d - orbitals can take 10 electrons. Thus $[Ar]4s^1 3d^5$ filled configuration is more stable.



2) In any atom the extra stability obtained when degenerate orbitals are half-filled or completely filled. In Cu $4s^1$ is half-filled because the s - orbitals can take 2 electrons, $3d^{10}$ is completely filled. Thus $[Ar]4s^1\ 3d^{10}$ configuration is more stable.



27. One atom of oxygen shares its two electrons with two hydrogen atoms to form a water molecule.



28. The earth's crust is the major source of metals. Sea water also contains some soluble salts such as sodium chloride and magnesium chloride, etc. Some metals like gold (Au), silver (Ag) and copper (Cu) are available in nature in free state as they are least reactive. Other metals are found in nature in the combined form due to their more reactivity. The elements or compounds of the metals which occur in nature in the earth's crust are called minerals.

Examples : 1) Clay 2) Epsom salt.

Section - IV

IV. Answer the following questions **5×4=20 M**

29. **Water of crystallization :** It is the fixed number of water molecules present in one formula unit of a salt.

Experiment :

Aim : To prove water of crystallization.

Required material :

1) Copper sulphate 2) Water 3) Test tube 4) Burner

Procedure :

Heat a few crystals of copper sulphate in a dry test tube. We find water droplets on sides of the test tube.

Add 2 to 3 drops of water on the sample of copper sulphate obtained after heating.

Observation :

Copper sulphate crystals which seem to be dry contain water of crystallization. when heated, this water is lost and the salts turn white.

If moistened the crystals gain water, the blue colour reappears.

(OR)

1) According to Newlands, every eighth element starting from a given element resembles in its properties to that of the starting element, when elements are arranged in ascending order of their atomic weights.

2) According to Newlands, the properties of fluorine and chlorine are similar and sodium and potassium are similar. Same aspect is given by modern periodic table.

3) Mendeleeff divided it into horizontal rows and vertical columns. He called them periods and groups respectively. Modern periodic table also gives the same.

4) According to Mendeleeff, the elements of same group have similar properties. Modern ·periodic table also proposed the same thing.

5) Mendeleeff gave the general formula for first group elements as and general formula for second group elements as RO. We can find the same thing in modern periodic table.

6) The elements of particular group possess same common valency. Same was proposed by modern periodic table.

30. **Periodic property :** The property in which there shall be a regular gradation is called periodic property.

I. a) Atomic radius :

Period : Atomic radius of elements decreases across a period from left to right because th:e nuclear charge increases due to increase in atomic number.

Group : Atomic radius increases from top to bottom in a group due to addition of new shell.

b) Ionization energy :

Period : When we move from left to right it does not follow a regular trend but generally increases due to increase in atomic number.

Group : In a group from top to bottom, the ionization energy decreases due to increase in atomic size.

c) Electron affinity :

Period : Electron affinity values increase from left to right in a period.

Group : Electron affinity values decrease from top to bottom in a group.

d) Electronegativity :

Period : Electronegativity increases from left to right in a period.

Group : Electronegativity decreases from top to bottom in a group.

II. Ionization energy order :

a) Na < Al < Cl b) Li < B < Be c) C < 0 < N

d) Na< F < Ne e) Ca< Mg< Be

(OR)

Daily life examples for hand picking :

1) Separating mud particles from rice is an example for hand picking because the colour and size of these two are different.
2) Similarly, the ore particles and the impurities are different in one of the properties like colour, size, etc. are separated by hand picking.

Daily life examples for washing :

1) We can clean some vegetables like potatoes by controlled flow of water. Less densive impurities are carried away by the flow leaving the more densive potatoes.

2) Similarly, ores are washed with controlled flow of water. Less densive impurities are carried away by water flow, leaving the more densive ore particles behind.

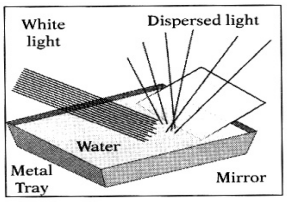
31. **Aim :** To find the focal length of lens by u – v method.
Apparatus : Convex lens, v – stand , screen, Candle and Scale.
Procedure :

1. Place the lens on a v – stand and place burring candle at a distance from the lens.
2. Adjust the screen on the other side of the lens . so that we get a clear image of the candle flame.
3. Note the object distance (u) and the image distance (v)
4. Repeat the experiment and note the reading of u and v in the following.

S.No	Object distance(u)	Image distance (v)	$f = \frac{uv}{u-v}$

5. Find the average focal length which gives the length of the lens.

(OR)



1. Take a metal tray and fill it with water.
2. Place a mirror in water such that it makes an angle to the water surface.
3. Now focus white light on the mirror through the water .
4. Keep a white cardboard sheet above the water surface.
5. Now we can observe the white light undergoing dispersing and forming rainbow.

32. **Aim :** To find the specific heat of given solid.

Meterial required :

Calorimeter, thermometer, stirrer, water, steam heater , woodenbox and lead shots.

Procedure :

1. Measure the mass of calorimeter with stirrer = m_1 g.
2. Fill one third of the volume of calorimeter with water, measure its mass and temperature.
3. Mass of calorimeter with water = m_2g.
4. Mass of water in calorimeter = $(m_2 - m_1)$g.
5. Initial temperature of water in calorimeter = T_1^0 C
6. Take few lead shots in steam bath and heat up to 100^0 C. Let this temperature beT_2^0C.
7. Transfer the lead shots quickly into calorimeter without heat loss.
8. After some time thermal equilibrium takes place., measure the temperature of the mixture, let it be T_3^0C.
9. Mass of lead shots = $(m_3 - m_1)$ grms.
10. Let S_l, S_w, S_c are specific heats of lead shots, water and calorimeter respectively.
11. According to principle of method of mixtures

$(m_3 - m_1)S_l(T_2 - T_1) = m_1 S_c (T_3 - T_1) + (m_2 - m_1)S_w (T_3 - T_1)$ or

$$S_l = \frac{(m_1 S_c + (m_2 - m_1)s_w)(T_3 - T_1)}{(m_3 - m_1)(T_2 - T_1)}$$ We know the specific heat of calorimeter and water. We can calculate the specific heat of the solid.

(OR)

Kirchhoff's laws : Two simple rules called Kirchhoff's rules are applicable to any DC circuit containing batteries and resistors connected in any way.

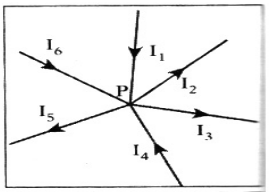
The two laws are (i) Junction law and (ii) Loop law.

i) Junction law :

Here P is called junction point where conducting wires meet. The junction law states that, at any junction point in a circuit where the current can divide, the sum of the currents into the junction must equal the sum of the currents leaving the junction.

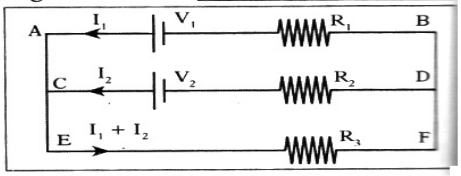
i.e., $i_1 + i_4 + i_6 = i_2 + i_3 + i_5$

This law is based on the conservation of charge.



ii) Loop law :

Loop law states that, the algebraic sum of the increases and decreases in potential difference (voltage) across various components of the circuit in a closed circuit loop must be zero.



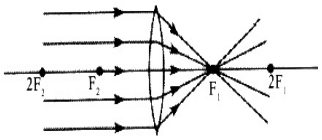
For the loop ACDBA, $-V_2 + I_2R_2 - I_1R_1 + V_1 = 0$

Similarly For the loop EFDCE, $-I_1R_3 - I_2R_3 - I_2R_2 + V_2 = 0$

Similarly For the loop EFBAE $-I_1R_3 - I_2R_3 - I_1R_1 + V_1 = 0$

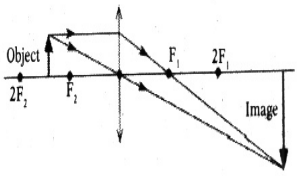
This law is based on the conservation of energy.

33. 1) **Object at infinity :** The rays coming from the object at infinity are parallel to principal axis and converge to the focal point after refraction . So, a point – sized image is formed at the focal point.



2) **Object placed between the centre of curvature and focal point :**

When an object is placed between centre of curvature ($2F_1$) and focus (F_2) , we will get an image which is real, inverted and magnified. This image will form beyond $2F_1$.



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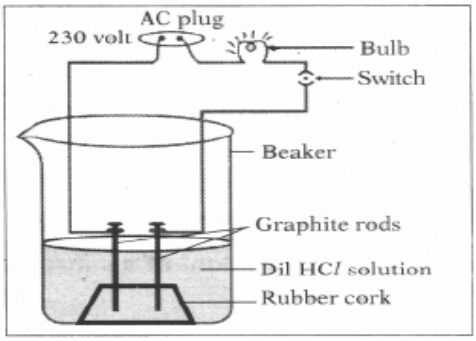

Acid solution in water conduct electricity