MODEL PAPER -II
PHYSICAL SCIENCE PAPER-I

(19E)

Class : X **Max.Marks : 50** **Time : 2hrs.15min.**

Instructions :

1. Question paper consists of 4 sections and 17 questions.
2. Internal choice is available only Q.No. 12 in Section III and for all the questions in Section-IV
3. In the duration of 2 house, 15 minutes of time is allotted to read the Question paper.
4. All answers should be written in the answer booklet only.
5. Answer should be written neatly and legibly.

SECTION - I **8 × 1 = 8 M**

1. Answer **all** the questions.
2. Each question carries **1** marks.

1. Guess the colour of the solution observed by placing zinc metal in copper sulphate solution ?
2. The aqueous solution of sodium chloride is called.....
3.

S.No.	Mineral / Ore	Formula	Metal Available
1	Horn Silver	Agcl	Ag
2	Bauxite	$Al_2O_32h_2O$	Al
3	Rock salt	Nacl	Na
4	Lime Stone	$CaCO_3$	Ca

From the above table, name one mineral/ore which is hydrous.

4. What is a homologous series ?
5. Name a mirror that can give an erect and enlarged image of an object ?
6. Which phenomenon of light for the working of the human eye ?
7. Draw the diagram showing rheostat ?
8. How are electric appliances connected in a domestic circuit?

SECTION - 2 **3 × 2 = 6 M**

1. Answer **all** the questions.
2. Each question carries **2** marks.

9. Which of the following hydrocarbons undergo addition reactions. C_2H_6,C_3H_8, C3H6, C_2H_2 and CH_4
10. Predict and write the reason, why the value of the distance of the object (u) is always negative in the mirror equation.
11. Rajkumar said to you that the magnetic field lines are open and they start at north pole of bar magnet and ends at south pole. What questions do you ask Rajkumar to correct him by saying" Field lines are closed"?

SECTION - III **3 × 4 = 12 M**

1. Answer **all** the questions.
2. Each question carries **4** marks.

12. Draw any one of the following diagrams :
   A) Draw magnetic field lines around bar magnet
   B) Draw the diagram showing that hydrogen gas is produced by the action of metals with acids.
13. Write the daily life application of heating effect of electric current ?
14. Observe the table and answer the following questions.

Alkane	Methane	Ethane	Propane	Butane
Molecular formula	CH_4	C_2H_6	C_3H_8	C_4H_{10}

   i) What is the general formula of Alkanes ?
   ii) Write the molecular formula of next alkane comes after Butane.
   iii) How many carbons are there in Pentane ?
   iv) How many bonds are present in Methane ?

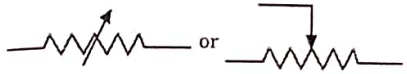
SECTION - IV **3 × 8 = 24 M**

1. Answer **all** the questions.
2. Each question carries **8** marks.
3. Each question has internal choice.

15. A) Explain brief the reason for the blue colour of the sky.
   (OR)
   B) Two lamps, one rated 100W at 220 V, and the other 60 W at 220 V. are connected in parallel to electric mains supply. What current is drawn from the line if the supply voltage is 220 V.
16. A) What are esters? Define esterification. Write chemical equation to illustrate it.
   (OR)
   B) Explain the significance of oxidation and reduction reaction in everyday life, Providing examples of each.
17. A) Explain the characteristics of images formed by a convex mirror with an activity.
   (OR)
   B) Suggest an activity to study the reaction of metals with water.

ANSWERS

SECTION -I

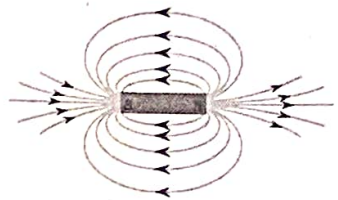
1. Colourless.
2. Brine solution.
3. Bauxite ($Al_2O_3.2H_2O$)
4. Homologous series : A series of compounds in which the same functional group substitutes for hydrogen in a carbon is a homologous series.
5. Concave mirror.
6. Refraction
7.  or
8. Parallel

SECTION - II

9. i) Unsaturated hydrocarbons like alkenes and alkynes, which have double or triple bonds between carbon atoms, can undergo addition reactions.
   ii) General formula of alkynes : CnH2n
   General formula of alkynes : CnH2n-2
   iii) In the given hydrocarbons, C3H6 and C2H2 will undergo addition reactions.
10. i) Direction of the incident rays in taken as position (+ve)
   ii) Object distance is measured from the pole to the object in the opposite direction of incident rays. So the objects distance (u) is always negative in the opposite direction of incident rays. So the object distance (u) is always negative in a mirror equation.
11. I asked Rajkumar some questions to correct him.
   i) Are the magnetic field lines, closed or open loops?
   ii) How do the filed lines behave-inside the magnet ?
   iii) Why is the magnetic compass needle following a curved path from one pole to another ?
   iv) What do field lines indicate ?
   v) What is the direction of the field line inside the magnet ?
   v) Is the direction of field lines, from its south pole or north pole ?

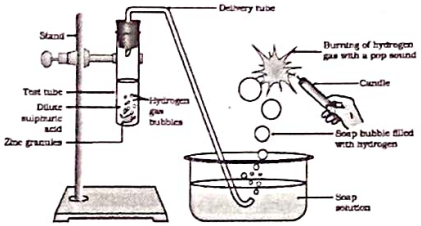
SECTION - III

12. A)



(OR)

B)



13. i) The heating effect of electric current is utilised in various daily life applications, including electric heaters and cooking appliances.
   ii) Electric irons and kettles convert electrical energy into heat for practical uses like pressing clothes and boiling water.
   iii) Incandescent light bulbs produce light through the heating of a filament, demonstrating another application of this effect.
   iv) Safety devices like fuses rely on the heating effect to protect against electrical overloads by melting and breaking the circuit.
14. i) The general formula of alkanes C_nH_{2n+2}
   ii) Pentane (C_5H_{12})
   iii) 5 carbons are there in pentane.
   iv) 4 bonds are present in methane.

SECTION - IV

15.A) i) Sky appears blue due to a phenomenon known as scattering of light, which may be defined as re-emission of light by atoms or molecules in all directions with different frequency when compared to incident frequency.

ii) An atom will respond to incoming light only when the wavelength is comparable to size of the atoms. Air and fine particles in the atmosphere have sizes smaller than visible light wavelengths.

iii) The atomic size of these molecules matches with wavelength of violet and blue colour light, So, these colours are scattered mor giving a beautiful blue colour to sky.

iv) Even though violet colour undergoes maximum scattering, we see the sky to be blue be cause human eye is more sensitive to blue colour than violet colour light.

(OR)

15. B) In a parallel circuit, the potential difference across each bulb is the same. So for both bulbs, the potential difference is 220V.

The current drawn by a bulb can be calculated using the formula :

$$\text{Current} = \frac{\text{Power}}{\text{Voltage}}$$

For the bulb with a power rating of 100W,

$$\text{Current} = \frac{100}{220} = 0.4545\text{A}$$

Similarly, for the bulb with a power rating of 60W,

$$\text{Current} = \frac{60}{220} = 0.2727\text{A}$$

∴ Hence, the current drawn from the lime

= 0.4545+0.2727

= 0.7272A

Total Power (P) = 100 + 60

= 160 W

Voltage = 220V

Power (P) = VI

$I = \frac{P}{V}$

$= \frac{160}{220} = 0.727\text{A}$

(OR)

16.A)i) Esters are organic compounds formed by the reaction between an acid and an alcohol.

ii) Esterification is the process of forming esters by combining an acid and an alcohol in the presence of an acid catalyst.

iii) The chemical equation for esterification is:

iv) Esters are commonly used in making perfumes and flavoring agents.

v) They can also be converted back into alcohol and carboxylic acid salts through saponification using sodium hydroxide.

vi) Esters play a significant roel in various industries due to their sweet-smelling properties and versatile applications.

(OR)

16. B) 1. Oxidation involves the gain of oxygen or loss of electrons by a substance, leading to chemical changes.

2. Examples of oxidation include rusting of iron, browning of fruits, and fading of colour in fabrics.

3. Reduction involves the loss of oxygen of gain of electrons by a substance, resulting in chemical transformations.

4. Understanding oxidation and reduction reactions is essential for comprehending chemical processes in daily life.

5. Identifying examples of oxidation and reduction reactions helps illustrate their significance in various contexts.

6. The blackening of a shiny brown element on heating in air exemplifies an oxidation reaction.

7. Reduction reactions can be observed in processes like the recovery of metals from their compounds.

8. Exploring the role of oxidation and reduction in everyday phenomena enhances scientific literacy and awareness.

9. Recognizing the effects of gain or loss of oxygen in oxidation and reduction reactions deepens understanding or chemical changes.

10. Overall, oxidation and reduction reactions play a crucial role in natural processes, industrial applications, and biological systems.

17. A) **Aim :** To explain the characteristics of image formed by a convex mirror.

Materials Required : A convex mirror, a pencil.

Procedure :

i) Take a convex mirror and hold it in one hand.

ii) Hold a pencil in the upright position in the other hand.

iii) Observe the image of the pencil in the mirror.

iv) Now move the pencil away from the mirror slowly and observe the changes in image.

Observations :

i) We observe that whatever may be the position of the pencil (object) in front of a convex mirror, it always forms a virtual, erect and diminished image.

ii) Nature, position and relative size of the image formed by a convex mirror.

Position of the object Position of the Size of the Image nature of the Image

Image At infinity At the focus F, High diminished, Virtual and erect behind the mirror Point -sized Between infinity and Between P and F Diminished Virtual and erect the pole P of the mirror behind the mirror

(OR)

17. B)

Aim : To study the reaction of metals with water.

Materials Required : Samples of Zn, Al, Cu, Fe, Mg, Ca, Na and K, water, test tube.

Procedure :

i) Collect samples of some metals.

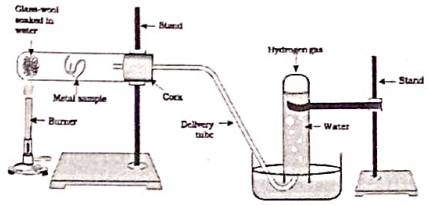
ii) Put small places of the samples separately in beakers half-filled with cold water.

iii) Observe the reaction and nature of the gas evolved.

iv) Now heat the beakers containing the metals which do not react with cold water.

v) Observe the metals which react with hot water.

vi) Now heat the beakers containing the metals which do not react with cold water.



Observations :

i) The reactivity of metals with cold water is as follows: Mg<Ca<Na<K

ii) Calcium and magnesium start floating on water.

iii) Some metals like Na, K react vigorously with water.

iv) Some metals like Mg react with hot water but not with cold water.

v) Some metals like Al, Fe and Zn react only with steam but not with cold water or hot water.

vi) Some metals like Cu and Hg do not react even with steam.

Conclusion:

i) The reaction of water with metals varies from metal to metal.

ii) The decreasing order of reactivity of metals with Water is K>Na>Ca>Mg>Al>Zn>Cu>Hg