SCERT, AP

MODEL PAPER – 3 (2024-2025)

CLASS - 10

GENERAL SCIENCE - Paper – I (Physical Science)

Time: 2 Hours **(English Version)** **Maximum Marks: 50**

Instructions:

1. Question paper consists of 4 sections and 17 Questions.
2. Internal Choice is there only for Q.No.12 in Section –III and for all the Questions in Section –IV.
3. In the duration of 2 hours, 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 x 1 = 8**

Notes: 1. Answer **ALL** the questions.
2. Each question carries **1** mark.

1. Pose any one question on the understand of rancidity

Ans: 1. Is rancidity a phenomenon of oxidation or reduction?
2. What is meant by rancidity?
3. Give examples of rancidity in daily life?

2. What is the common name of the compound $CaOCl_2$?

Ans: Bleaching powder

3.

Substance	**A**	**B**
Formula	**$CaOCl_2$**	**Na_2CO_3**

Which is used for free of germs in drinking water?

Ans: A

4. What type of oxides are formed when non-metals combine with oxygen?

Ans: Acidic oxides

5. Write any one use of ethanoic acid/acetic acid.

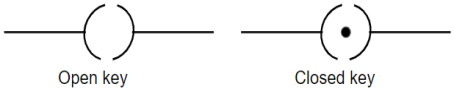
Ans: i) It is used as vinegar for preparing pickles ii) It is used for the preparation of aspirin.

6. Define Dispersion of light?

Ans: The splitting of white light into its component colours is called Dispersion.

7. Draw the symbol of Plug key or switch

Ans:



8. What is the SI unit of resistivity?

Ans: ohm (or) Ω

SECTION - II **3 x 2 = 6**

Notes: 1. Answer **ALL** the questions.
2. Each question carries **2** marks.

9. A hydrocarbon is combination of four carbons and ten hydrogens.
i) Write the formula of this hydrocarbon ii) Write its name

Ans: i) C_4H_{10} ii) Butane

10. If A, B are optical medium of their refractive indices are nearly same, then light ray travel from A to B, What happens?

Ans: There is no refraction of light when it travels from one medium to another.

11. Pose any two questions to understand the concept of resistance.

Ans: 1. What is resistance?
2. What is the SI unit of resistance?
3. Draw the symbol of resistor of resistance.
4. On what factors does the resistance of a conductor depend? (**Note:** Write any two relevant questions)

SECTION - III 3 x 4 = 12

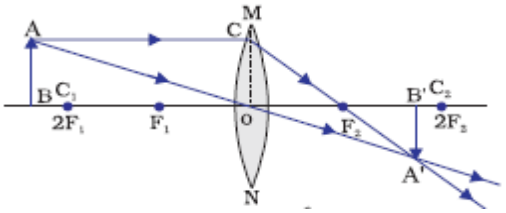
Notes: 1. Answer **ALL** the questions.
2. Each question carries **4** marks.

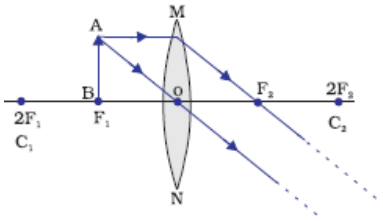
12.Draw any one of the following diagrams:

(A) Draw the ray diagrams of image formed when the object is placed infront of a bi-convex lens in the following positions.

(a) Beyond $2F_1$ **(b) At F_1**

Ans:





(B) Draw a diagram of passing carbon dioxide gas through calcium hydroxide solution when metal carbonates or metal hydrogen carbonates react with acids.

Ans:

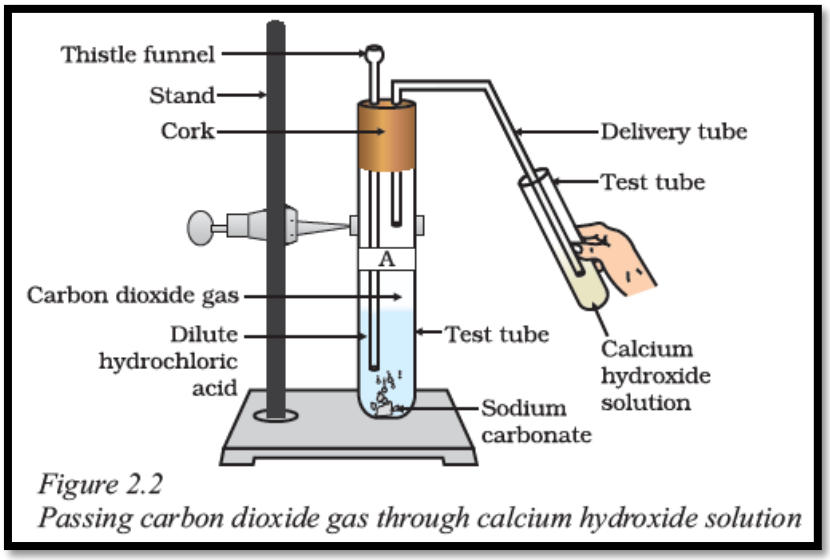


Figure 2.2
Passing carbon dioxide gas through calcium hydroxide solution

13. What are the applications of p^H in daily life.

Ans:i. Plants and animals has sensitive p^H values

i) When pH of rain water is less than 5.6, it is called acid rain.
ii)When acid rain flows in to the rivers, it lowers the pH of the river water, the survival of aquatic life in such rivers becomes difficult.

ii. Tooth decay

i) Tooth decay starts when the pH of the mouth is lower than 5.5.
ii) Tooth enamel, made of calcium phosphate is the hardest substance in the body.
iii) But is corroded when the pH in the mouth is below 5.5.

iii. p^H in our digestive system

i) During indigestion the stomach produces too much acid and this causes pain and irritation.
ii) To get rid of this pain, people use bases called antacids.

iv. p^H of the soul

i) Plants require a specific pH range for their healthy growth.

14. If radius of curvature of the mirror is double times of the focal length, then complete the following table.

f (in cm)	R (in cm)
12	
24	
	15
	20

Ans:

f (in cm)	R (in cm)
12	**24**
24	**48**
7.5	15
10	20

SECTION - IV 3 x 8 = 24

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

15. Explain the following.
a) Scattering of light b) Tyndall effect

Ans: a) Scattering of light

i) The blue colour of the sky, colour of water in deep sea, the reddening of the sun at sunrise and the sunset are some of the wonderful phenomena.

ii)The scattering of light by colloidal particles. The path of a beam of light passing through a true solution is not visible. However, its path becomes visible through a colloidal solution where the size of the particles is relatively larger.

b) Tyndall effect

i) The earth's atmosphere is a heterogeneous mixture of minute particles. These particles include smoke, tiny water droplets, suspended particles of dust and molecules of air.

ii) When a beam of light strikes such fine particles, the path of the beam becomes visible.

iii) The light reaches us, after being reflected diffusely by these particles.

iv) The phenomenon of scattering of light by the colloidal particles is Tyndall effect.

(OR)

Explain
i) Why is the tungsten used almost exclusively for filament of electric lamps?
ii) Why should we connect electric appliances in parallel in a household circuit? What happens if they are connected in series?

Ans: i) Tungsten has a high resistivity and high melting point. So, it used as filament in electric lamps.

ii) If we connect electric appliances in parallel in a household circuit, then one of component fails the circuit does not break and remaining components are works.

In case of series arrangement, if one component fails the circuit is broken and none of the components works.

16. Explain the following chemical reactions with example.
i) Chemical combination ii) Chemical decomposition
iii) Chemical displacement iv) Chemical double displacement

Ans:i) Combination reaction: A reaction in which a single product is formed from two or more reactants is known as a combination reaction.

Ex: Calcium oxide reacts vigorously with water to produce slaked lime.

$$CaO + H_2O \rightarrow Ca(OH)_2$$

ii) Decomposition reaction: A reaction in which a single substance decomposes to give two or more substances is known as decomposition reaction.

Ex: Decomposition of calcium carbonate to calcium oxide and carbon dioxide on heating.

$$CaCO_3 \xrightarrow{heat} CaO + CO_2$$

iii) Displacement reaction: The reaction in which an element has displaced or removed another element from the molecule is called displacement reaction.

Ex: Iron has displaced another element copper from copper sulphate solution.

$$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$$

iv) Double displacement reaction: The reaction in which there is an exchange of ions between the reactants are called double displacement reactions.

Ex: Sodium sulphate and Barium chloride are reacting and exchange their ions.

$Na_2SO_4 + BaCl \rightarrow BaSO_4 + 2NaCl$

(OR)

How can ethanol and ethanoic acid be differentiated on the basis of their physical and chemical properties?

Ans: Physical properties:

i) Smell: Ethanol has a pleasant smell. Ethanoic acid has pungent smell.

ii) Melting point: Melting point of ethanol is very lower than ethanoic acid.

iii) Boiling point: Boiling point of ethanol is very lower than ethanoic acid.

Chemical properties:

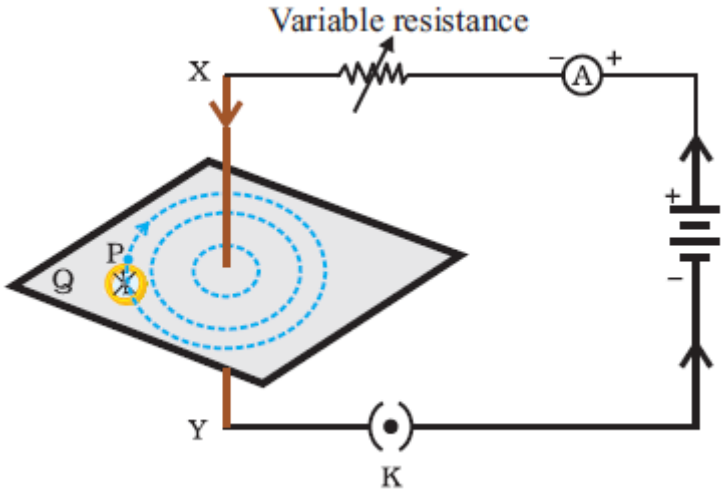
Ethanol	Ethanoic acid
It is a neutral compound	It is an acidic compound
It does not reaction with metal carbonates	It reacts with metal carbonates to form salt, water and carbon dioxide
It does not give Brisk effervescence	It gives Brisk effervescence
It is oxidized	It is not oxidized

17. Describe an activity to show the direction of magnetic lines produced by a current-carrying conductor.

Ans:

Aim: To study the magnetic field lines around a straight current carrying straight conductor.

Required materials: Battery, Variable resistance, Ammeter, Plug key, Thick copper wire, Cardboard, Iron filings.



Procedure: 1. As shown in the figure, connecting the circuit.

2. Insert the thick wire through the centre, normal to the plane of a rectangular cardboard. Take care that the cardboard is fixed and does not slide up or down.
3. Connect the copper wire vertically between the points X and Y, as shown in Fig. (a), in series with the battery, a plug and key.
4. Sprinkle some iron filings uniformly on the cardboard.
5. Keep the rheostat at a fixed position and note the current through the ammeter. Close the key so that a current flows through the wire. Ensure that the copper wire placed between the points X and Y remains vertically straight.
6. Gently tap the cardboard a few times.
7. We Observe that the iron filings align themselves showing a pattern of concentric circles around the copper wire
8. Place a compass at a point (say P) over a circle. The direction of the north pole of the compass needle would give the direction of the field lines produced by the electric current through the straight wire at point P.

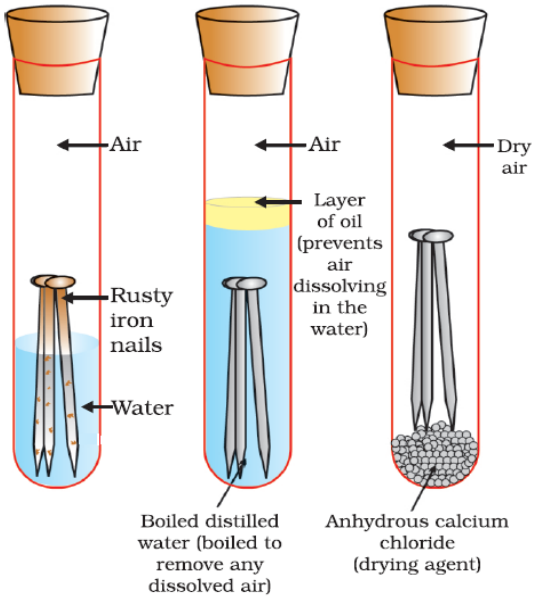
(OR)

Explain the experimental procedure to investigate the conditions under which iron rusts.

Ans:

Aim: Investigate the conditions under which iron rusts.

Required Materials: Test tubes, Iron nails, Water, Boiled distilled water, Anhydrous calcium chloride.



Procedure: i) Take three test tubes and place clean iron nails in each of them.

ii) Label these test tubes A, B and C. Pour some water in test tube A and cork it.

iii) Pour boiled distilled water in test tube B, add about 1 mL of oil and cork it. The oil will float on water and prevent the air from dissolving in the water.

iv) Put some anhydrous calcium chloride in test tube C and cork it. Anhydrous calcium chloride will absorb the moisture, if any, from the air. Leave these test tubes for a few days and then observe figure.

Observation: i) We observe that iron nails rust in test tube A, but they do not rust in test tubes B and C.

ii) In the test tube A, the nails are exposed to both air and water. In the test tube B, the nails are exposed to only water, and the nails in test tube C are exposed to dry air.