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CBSE Laboratory Manual **SCIENCE**



Class 10

Name

School

Class..... Section

Roll No.

CONTENTS

Unit	Topic
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● INTRODUCTION OF LAB WORK

Unit I : Chemical Substance : Nature and Behaviour

1. Chemical Reactions and Equations

Experiment 1.1 : To perform and observe the action of water on quicklime.

Experiment 1.2 : To perform and observe the reaction when ferrous sulphate crystals are heated.

Experiment 1.3 : To perform and observe the reaction between iron nail and copper sulphate solution.

Experiment 1.4 : To perform and observe the reaction between sodium sulphate and barium chloride in aqueous solution.

2. Acids, Bases & Salts

Experiment 2.1 : To find the pH of the following samples using pH paper/universal indicator —

- (a) Dilute Hydrochloric Acid
- (b) Dilute NaOH solution
- (c) Dilute Ethanoic Acid solution
- (d) Lemon Juice
- (e) Water
- (f) Dilute Sodium Bicarbonate solution.

Experiment 2.2 : To find the properties of an acid by its reaction with—

- (a) Litmus Solution (blue and red)
- (b) Zinc metal
- (c) Solid Sodium Carbonate.

Experiment 2.3 : To study the properties of a base by its reaction with—

- (a) Litmus Solution (blue and red)
- (b) Zinc metal
- (c) Hydrochloric Acid.

3. Metals and Non-Metals

Experiment 3.1 : To observe the action of Zn, Fe, Cu and Al metals on the aqueous solution of $[\text{ZnSO}_4(\text{aq.})]$

Experiment 3.2 : To observe the action of Zn, Fe, Cu and Al metals on the aqueous solution of $[\text{FeSO}_4(\text{aq.})]$

Experiment 3.3 : To observe the action of Zn, Fe, Cu and Al metals on the aqueous solution of $[\text{CuSO}_4(\text{aq.})]$

Experiment 3.4 : To observe the action of Zn, Fe, Cu and Al metals on the aqueous solution of $[\text{Al}_2(\text{SO}_4)_3(\text{aq.})]$

4. Carbon and its Compounds

Experiment 4.1 : To study the following properties of acetic acid (ethanoic acid) CH_3COOH .

- (i) Odour

...contd. Contents

Unit	Topic
	(ii) Solubility in water (iii) Effect on Litmus Paper (iv) Reaction with sodium bicarbonate.
Experiment 4.2 :	To study the comparative cleaning capacity of a sample of soap in soft and hard water.
Unit II : World of Living	
5. Life Processes	
Experiment 5.1 :	To prepare a temporary mount of a leaf peel to show stomata
Experiment 5.2 :	To show experimentally that carbon dioxide is given out during respiration.
6. How Do Organisms Reproduce?	
Experiment 6.1 :	To study— (a) binary fission in Amoeba (b) Budding in yeast with the help of prepared slides.
Experiment 6.2 :	To identify the different parts of an embryo of a dicot seed (pea, gram or red kidney bean).
Unit III : Effects of Current	
7. Electricity and Electric Current	
Experiment 7.1 :	To study the dependence of potential difference (V) across a resistor on the current (I) passing through it and determine its resistance, and plot a graph between V and I.
Experiment 7.2 :	To determine the equivalent resistance of two resistors when connected in series
Experiment 7.3 :	To determine the equivalent resistance of two resistors when connected in parallel
Unit IV : Natural Phenomena	
8. Light : Reflection and Refraction	
Experiment 8.1 :	To determine the focal length of a concave mirror by obtaining image of a distant object.
Experiment 8.2 :	To determine the focal length of a convex lens by obtaining image of distant object.
Experiment 8.3 :	To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence, angle of refraction and angle of emergence and interpret the result.
Experiment 8.4 :	To trace the path of rays of light passing through a glass prism.
Experiment 8.5 :	To draw the images of an object formed by a convex lens when placed at various positions.

CHAPTER 1

CHEMICAL REACTIONS AND EQUATIONS

VIVA VOCE

Q.1. What is a metal displacement reaction ?

Ans. A reaction in which a more reactive metal displaces a less reactive metal from its salt solution is called a metal displacement reaction.

Q.2. What is the commercial name of ferrous sulphate heptahydrate ?

Ans. $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ is commercially called Green vitriol.

Q.3. How will you show that a given solution is alkaline in nature ?

Ans. Dip a piece of red litmus paper into the given solution. If red litmus paper turns blue, the given solution is alkaline in nature.

Q.4. Write the balanced chemical equation which describes the thermal decomposition of ferrous sulphate.

Ans. $2\text{FeSO}_4(\text{s}) \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3(\text{s}) + \text{SO}_2(\text{g}) + \text{SO}_3(\text{g})$

Q.5. When you dip an iron nail in the blue solution of copper sulphate and wait for about 20 minutes, what is the change in the colour of the solution.

Ans. $\text{Fe} + \text{CuSO}_4 \longrightarrow \text{FeSO}_4 + \text{Cu}$
 (Blue) (Green)

Blue colour fades slowly and finally becomes light green.

Q.6. What is the colour of precipitate formed when aqueous solutions of sodium sulphate and barium chloride are mixed ?

Ans. A white precipitate.

Q.7. $\text{CaO}(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{Ca}(\text{OH})_2(\text{aq})$, what type of reaction is this ?

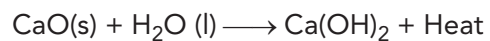
Ans. Combination reaction.

Q.8. Name the gases formed on heating iron (II) sulphate ?

Ans. SO_2 and SO_3 .

Q.9. Why does iron container containing calcium oxide becomes hot when water is added to it.

Ans. When water is added to calcium oxide, calcium hydroxide is formed and heat is evolved. As a result, iron container becomes hot.



Q.10. Give an example of double displacement reaction.

Ans. Reaction of aqueous solution of sodium sulphate with aqueous solution of barium chloride.



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CHAPTER 2

ACIDS, BASES & SALTS

VIVA VOCE

Q.1. What is an acid ?

Ans. A hydrogen containing compound which gives free hydronium ions (H_3O^+) in its aqueous solution is called an acid.

For eg : HCl (Hydrochloric acid), H_2SO_4 (Sulphuric acid) etc.

Q.2. A colourless, odourless gas when ignited with a burning matchstick produces a popping sound. Name the gas.

Ans. The gas is hydrogen gas.

Q.3. How is pH paper used to find the pH of a solution ?

Ans. By dipping a part of pH paper into a solution of interest and watching the color change.

Q.4. Classify the following into acidic oxides and basic oxides :

Na_2O , SO_2 , MgO , CO_2

[Board Term-I Set-WHISGOB, 2014]

Ans. Acidic oxides — SO_2 , CO_2

Basic oxides — Na_2O , MgO

[CBSE Marking Scheme, 2016]

Q.5. How can you find whether the given solution is acidic, basic or neutral using litmus paper ?

Ans. Acid solutions turn blue litmus red, basic solutions turn red litmus blue. Neutral solution does not affect litmus paper.

Q.6. To test the presence of an acid with a strip of red litmus paper you would _____.

Ans. Since red litmus shows no colour change with acids, it is first to be changed to blue litmus. So, first dip the strip in alkaline solution and then use it to test the sample.

Q.7. Why does zinc and magnesium give hydrogen gas when reacted with dilute H_2SO_4 (or dilute HCl) ?

Ans. Both zinc and magnesium are more electropositive than hydrogen. So, these metals displace hydrogen from acids.

Q.8. How does an acid differ from a base in its taste ?

Ans. Acids and their solutions are sour in taste while bases and their solutions are bitter in taste.

Q.9. What is the name of the compound Na_2ZnO_2 ?

Ans. This compound is called sodium zincate.

Q.10. Write two precautions required while finding the pH of the samples.

- Ans.** (i) Wash the test-tubes and other glass apparatus thoroughly with distilled water, before use.
(ii) All solutions should be freshly prepared.

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CHAPTER 3

METALS AND NON-METALS

VIVA VOCE

Q.1. What is the colour of copper metal ?

Ans. It is reddish brown in colour.

Q.2. Why is Al more reactive than Zn ?

Ans. It is because Al can lose electrons more easily than Zn.

Q.3. Why are ornaments made from silver and gold metals ?

Ans. They are lustrous and least reactive.

Q.4. What happens when iron metal is put in copper sulphate solution ?

Ans. The colour of solution becomes light green and copper metal gets deposited.

Q.5. Name any two metals that are more reactive than iron ?

Ans. Zinc and aluminium.

Q.6. Why metals are called electropositive elements ?

Ans. Because metals show a tendency to lose electrons to form positively charged ions (called cations).

Q.7. What is meant by activity series of metals ?

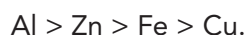
Ans. The arrangement of metals in a vertical column in the order of decreasing reactivity is called the activity series of metals, where hydrogen acts as a standard reference. Metals above to it are highly reactive and below to it are least reactive.

Q.8. Which metals are able to displace hydrogen from acid solutions ?

Ans. Metals which appear above hydrogen in the reactivity series are able to displace hydrogen from acid solutions.

Q.9. Arrange Zn, Cu, Fe and Al in the decreasing order of reactivity.

Ans. The arrangement in the decreasing order of reactivity is :



Q.10. What is the colour of the solution of copper sulphate ?

Ans. Blue.

CHAPTER 4

CARBON AND ITS COMPOUNDS

**VIVA
OCE**

Q.1. Why is ethanoic acid named as glacial acetic acid ?

Ans. Ethanoic acid, on cooling below 16.5°C , forms ice-like crystals. Therefore, it is named as glacial acetic acid.

Q.2. What do you mean by esterification ?

Ans. Ethanoic acid reacts with alcohol in the presence of dehydrating agents to form ester. This reaction is called esterification.

Q.3. What is the name of $-\text{COOH}$ part of acetic acid ?

Ans. It is called carboxylic group.

Q.4. What is the role of concentrated H_2SO_4 in esterification ?

Ans. It acts as a dehydrating agent.

Q.5. What is meant by decarboxylation ?

Ans. Removal of carboxyl group from the molecule of a carboxylic acid or its sodium salt by heating with soda lime is called decarboxylation.

Q.6. What is the name of the reaction between acetic acid and ethyl alcohol ?

Ans. The reaction between acetic acid and ethyl alcohol is esterification.

Q.7. What is the cause of hardness of water ?

Ans. The presence of hydrogen carbonates, chlorides and/or sulphates of calcium or magnesium in water makes it hard.

Q.8. How can you prepare a sample of hard water ?

Ans. A sample of hard water can be prepared by adding a very small quantity of calcium chloride or magnesium chloride or magnesium sulphate to distilled water.

Q.9. Why do the different soaps have different foaming capacities ?

Ans. It is because they are made up of different salts of different fatty acids.

Q.10. What is meant by lather ?

Ans. Foam produced by soap in water is called lather.

UNIT II World Living

CHAPTER 5

LIFE PROCESSES

VIVA
VOCE

Q.1. What are guard cells ?

Ans. The stomata is surrounded by two kidney-shaped cells known as guard cells.

Q.2. How is opening and closing of stomata controlled ?

Ans. Turgidity of guard cells controls the opening and closing of stomata.

Q.3. Name the type of stomata present in xerophytes.

Ans. Sunken stomata.

Q.4. What is respiration ?

Ans. It is a biochemical process in which food is oxidized to release energy.

Q.5. Which cell organelle is concerned with aerobic respiration ?

Ans. Mitochondria.

Q.6. In which form is energy stored in cells ?

Ans. ATP (Adenosine tri phosphate).

Q.7. Name the process in which food is oxidized without using oxygen.

Ans. Anaerobic respiration.

Q.8. What will happen if in the small tube, NaOH (sodium hydroxide) is taken in place of KOH ?

Ans. The carbon dioxide produced by germinating seeds will not be absorbed by NaOH solution, hence water level will not rise in delivery tube and purpose of experiment will be lost.

Q.9. Why should the experimental set-up be made airtight ?

Ans. The experimental set-up should be air-tight so that no air enters inside and CO₂ produced during respiration does not escape.

Q.10. Name a plant where stomata are absent.

Ans. Aquatic plant — *Hydrilla*.



CHAPTER 6

HOW DO ORGANISMS REPRODUCE ?

VIVA VOCE

Q.1. What are the types of cell division that occur during asexual reproduction ?

Ans. Amitosis and mitosis.

Q.2. Give two advantages of vegetative propagation.

Ans. (i) It is a rapid and easier method.

(ii) It is only a method of reproduction for species which never produce viable seeds (e.g., banana).

Q.3. Why do we classify budding, fission, spore formation etc. as asexual reproduction ?

Ans. These processes involve single parent, no gamete formation occurs, and no fertilization takes place, hence we classify them as asexual reproduction.

Q.4. Give the technical term for the (i) division of cytoplasm (ii) division of nucleus.

Ans. (i) Cytokinesis, (ii) Karyokinesis.

Q.5. What is budding ?

Ans. Budding is a kind of asexual reproduction in which a new organism is developed from an outgrowth or bud of the cell due to cell division that happens at one particular site.

Q.6. Which part in a germinating seed is known as future shoot and future root?

Ans. Plumule and radicle respectively.

Q.7. Which structure of seed contains rudimentary plant ?

Ans. The embryo of seed contains rudimentary plant.

Q.8. What is epicotyl and hypocotyl ?

Ans. The embryonal axis above the level of cotyledon is called epicotyl which terminates in plumule, the future shoot. The part below the level of cotyledon is called hypocotyl which terminates in radicle, the future root.

Q.9. What provides food to developing embryo ?

Ans. Cotyledon provides food to developing embryo till it becomes a green young plant.

Q.10. How many seed coats are generally present in a seed ?

Ans. Two, outer one is called testa and inner one is called tegmen.



UNIT III Effects of Current

CHAPTER 7

ELECTRICITY AND ELECTRIC CURRENT

VIVA VOCE

Q.1. What is meant by current ? What is the SI unit of current ?

Ans. The rate of flow of charge (Q) through a conductor is called current (I), i.e.

$$\text{Current} = \frac{\text{Charge}}{\text{Time}} = \frac{Q}{t}$$

The SI unit of current is ampere (A). One ampere is equal to one coulomb per second.

Q.2. For what purpose an ammeter is used ?

Ans. The ammeter is used for measuring the current flowing through the circuit.

Q.3. For what purpose a voltmeter is used ?

Ans. The voltmeter is used for measuring the potential difference (or voltage) between any two points of a conductor or in any part of the circuit.

Q.4. What is meant by emf of a cell ?

Ans. The maximum potential difference which exists across the terminals of a cell when no current is drawn out of the cell is called its emf, i.e. electromotive force.

Q.5. Can the equivalent resistance of parallel combination be greater than the individual resistance ?

Ans. No, in fact the equivalent resistance of parallel combination is smaller than the smallest resistance in the given combination.

Q.6. Can the equivalent resistance of series combination be smaller than any of the individual resistances ?

Ans. No, in series combination, the resultant or combined resistance is always greater than each individual resistance.

Q.7. In what way household appliances should be connected ?

Ans. Parallel.

Q.8. Two resistors are connected in series and then in parallel. What effect will it have on the reading of voltmeter and ammeter ?

- Ans.**
- When the resistors are connected in series, the ammeter will show less value of current (less reading) while reading of voltmeter depends on the value of resistor across which it is connected.
 - When resistors are connected in parallel, then ammeter will show high value of current (high reading) while the reading of the voltmeter will be equal to the voltage of power supply.

Q.9. What is resistivity ?

Ans. Resistivity is the resistance offered by a conductor of unit length and unit cross-sectional area.

Q.10. What is the law that governs the parallel combination of resistances ?

Ans. Law of combination of resistances connected in parallel states that the resultant resistance of the resistors connected in parallel is the sum of the reciprocals of their individual resistances.

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \dots\dots\dots$$

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CHAPTER 8

LIGHT : REFLECTION & REFRACTION

VIVA
VOCE

Q.1. What is meant by lateral inversion ?

Ans. Lateral inversion means the apparent reversal of the mirror image's left and right when compared with the object. It is actually the inversion of the image.

Q.2. What do you understand by focal length of a spherical mirror ?

Ans. It is the distance between the pole and focus of the mirror. It is denoted by symbol 'f'.

Q.3. What is the nature of the image when the object is placed at the focus 'F' of the mirror ?

Ans. Image is real, enlarged and is formed at infinity.

Q.4. What is the principal axis of a lens ?

Ans. The imaginary line passing through the centre of curvature of the two spherical surfaces of the lens is the principal axis.

Q.5. How is the power of a lens described ?

Ans. The reciprocal of the focal length of a lens expressed in metres is called its power.

$$P = \frac{1}{\text{Focal length of the lens (in metres)}}$$

Q.6. What is meant by focal plane of a lens ?

Ans. The vertical plane perpendicular to the principal axis and passing through the principal focus is called the focal plane of the lens.

Q.7. What is lateral displacement ?

Ans. The perpendicular distance of separation between the emergent ray and the original path of the incident ray is called lateral displacement.

Q.8. On what factors does the degree of bending of a ray of light when it enters another medium depend ?

Ans. The degree of bending of a ray of light as it enters another medium depends on the refractive index of that medium relative to the medium from which the light is coming.

Q.9. What is the angle of the prism ?

Ans. It is the angle between the two refracting faces of the prism.

Q.10. What is the angle of deviation (δ) ?

Ans. The angle between the original path of the incident ray and the emergent ray coming out of the prism is called the angle of deviation (δ).

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