KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION

CLASS-X

SCIENCE(086)

(STUDY CAPSULE)

VOL-I

SESSION-2025-26

तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

SESSION-2025-26

KENDRIYA VIDYALAYA SANGATHAN,

RAIPUR REGION

OUR MENTORS

Mrs. P.B.S.USHA

Deputy Commissioner

Kendriya Vidyalaya Sangathan,

Regional Office, Raipur

Shri. Vivek Kumar Chauhan
Assistant Commissioner
Kendriya Vidyalaya Sangathan,

Regional Office, Raipur

Shri. Ravindra Kumar,

Assistant Commissioner

Kendriya Vidyalaya Sangathan,

Regional Office, Raipur

COURSE COORDINATOR

Mrs. Bhubneshwari

Principal, K.V.,C.I.S.F,

Utai, Bhilai, Dist.-Durg(C.G.)

RESOURCE PERSON

1. Mrs. Juhi Chakraborty, TGT(Science), K.V.Bilaspur

2. Mrs. Sunita Minj, TGT(Science), K.V.Raipur NO.-01

VETTED BY:

1.Subir kumar Sinha, PGT(Bio), PM Shri K.V.Jnajgir

2.Manoj Posham, PGT(Bio), K.V.Kawardha

3.Swati Singh, TGT(Science), K.V.Raigarh

4.Anurudh Singh, TGT(Science), K.V.Kirandul

5. Ashok Kushwaha, TGT(Science), K.V.Jhagrakhand

CONTENT DEVELOPER TEAM FOR VOL-I (2025-26)

S.NO.	CHAPTER'S NAME	NAME OF TEACHER	NAME OF KENDRIYA VIDYALAYA
1.	**CHEMICAL REACTION AND EQUATION**	PALAK	K.V. KHAIRAGARH
2.	**ACIDS, BASES AND SALTS**	ARCHIE GAUR	K.V. JAGDALPUR
3.	**METALS AND NON METALS**	RADHESHYAM BUDHIA	K.V. BAIKUNTPUR
4.	**LIFE PROCESSES**	GEETU	K.V. CISF BHILAI
5.	**CONTROL AND COORDINATION**	DIVYA MARAI	K.V. NAYA RAIPUR
6.	**HOW DO ORGANISMS REPRODUCE?**	SUSHMA NAYAK	K.V. BMY BHILAI
7.	**LIGHT REFLECTION & REFRACTION**	ASHISH VERMA	K.V. BIJAPUR
8.	**HUMAN EYE AND COLOURFUL WORLD**	ADITYA SRIVAS	K.V. BILASPUR
9.	**ELECTRICITY**	RICHA YADAV	K.V. DANTEWADA
10.	**OUR ENVIRONMENT**	KIRAN VISHWAKARMA	K.V. AMBIKAPUR

INDEX

COURSE STRUCTURE

SCIENCE (086)

CLASS X (2025-26)

(Annual Examination)

Time: 03 Hours **Marks: 80**

Unit No.	Unit	Marks
I	Chemical Substances-Nature and Behaviour	25
II	World of Living	25
III	Natural Phenomena	12
IV	Effects of Current	13
V	Natural Resources	05
	Total	**80**
	Internal assessment	**20**
	Grand Total	**100**

Theme: Materials

Unit I: Chemical Substances - Nature and Behaviour

Chemical Reactions and Equations: Chemical reactions, Chemical equation, Balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, endothermic exothermic reactions, oxidation and reduction.

Acids, Bases and Salts: Acids and Bases – definitions in terms of furnishing of H+ and OH– ions, identification using indicators, chemical properties, examples and uses, neutralization, concept of pH scale (Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris.

Metals and Non-metals: Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds; Basic metallurgical processes; Corrosion and its prevention.

Carbon and its Compounds: Covalent bonds – formation and properties of covalent compounds, Versatile nature of carbon, Hydrocarbons – saturated and unsaturated Homologous series. Nomenclature of alkanes, alkenes, alkyne and carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes). Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps anddetergents.

Theme: The World of the Living

Unit II: World of Living

Life processes: 'Living Being'. Basic concept of nutrition, respiration, transport and excretion in plantsand animals.

Control and co-ordination in animals and plants: Tropic movements in plants; Introduction of plant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary and reflex action; Chemical co-ordination: animal hormones.

Reproduction: Reproduction in animals and plants (asexual and sexual) reproductive health - need and methods of family planning. Safe sex vs HIV/AIDS. Child bearing and women's health.

Heredity and Evolution: Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination; brief introduction.

Theme: Natural Phenomena

Unit III: Natural Phenomena

Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification.

Refraction; Laws of refraction, refractive index.

Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula (Derivationnot required); Magnification. Power of a lens.

Functioning of a lens in human eye, defects of vision and their corrections, applications ofspherical mirrors and lenses.

Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life (excluding colour of the sun at sunrise and sunset).

Theme: How Things Work

Unit IV: Effects of Current

Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R.

Magnetic effects of current: Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying

conductor, Fleming's Left Hand Rule, Direct current. Alternating current: frequency of AC. Advantage of AC over DC. Domestic electric circuits.

Theme: Natural Resources

Unit V: Natural Resources

Our environment: Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable substances.

Note for the Teachers:

The NCERT text books present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.

PRACTICALS

Practical should be conducted alongside the concepts taught in theory classes. LIST OF EXPERIMENTS

1. A. Finding the pH of the following samples by using pH paper/universal indicator: **Unit-I**

a) Dilute Hydrochloric Acid
b) Dilute NaOH solution
c) Dilute Ethanoic Acid solution
d) Lemon juice
e) Water
f) Dilute Hydrogen Carbonate solution

B. Studying the properties of acids and bases (HCl & NaOH) on the basis of their reaction with: **Unit-I**

a) Litmus solution (Blue/Red)
b) Zinc metal
c) Solid sodium carbonate

2. Performing and observing the following reactions and classifying them into: **Unit-I**

a) Combination reaction
b) Decomposition reaction
c) Displacement reaction
d) Double displacement reaction

- Action of water on quicklime
- Action of heat on ferrous sulphate crystals

- Iron nails kept in copper sulphate solution
- Reaction between sodium sulphate and barium chloride solutions

Observing the action of Zn, Fe, Cu and Al metals on the following salt solutions:

Unit-I

e) $ZnSO_4$ (aq)
f) $FeSO_4$ (aq)
g) $CuSO_4$ (aq)
h) $Al_2 (SO_4)_3$ (aq)

Arranging Zn, Fe, Cu and Al (metals) in the decreasing order of reactivity based on theabove result.

3. Studying the dependence of potential difference (V) across a resistor on the current **(I) passing through it and determine its resistance. Also plotting a graph between V and I.** **Unit-IV**

4. Determination of the equivalent resistance of two resistors when connected in series and parallel. **Unit-IV**

5. Preparing a temporary mount of a leaf peel to show stomata. **Unit- II**

6. Experimentally show that carbon dioxide is given out during respiration. **Unit-II**

7. Study of the following properties of acetic acid (ethanoic acid): **Unit- I**

a) Odour
b) solubility in water
c) effect on litmus
d) reaction with Sodium Hydrogen Carbonate

8. Study of the comparative cleaning capacity of a sample of soap in soft and hard water. **Unit- I**

9. Determination of the focal length of: **Unit-III**

a) Concave mirror
b) Convex lens by obtaining the image of a distant object.

10. Tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. Measure the angle of incidence, angle of refraction, angle of emergence andinterpret the result. **Unit - III**

11. Studying (a) binary fission in *Amoeba,* and (b) budding in yeast and Hydra with the help of prepared slides. **Unit-II**

12. Tracing the path of the rays of light through a glass prism. **Unit-III**

13. Identification of the different parts of an embryo of a dicot seed (pea, gram or red kidney bean). **Unit-II**

Question Paper Design (Theory) Class X

(2025-26)

Science (086)

Theory (80 marks)

Competencies	Total
Demonstrate Knowledge and Understanding	50 %
Application of Knowledge/Concepts	30 %
Formulate, Analyze, Evaluate and Create	20 %

Note:

- Typology of Questions: VSA including objective type questions, Assertion – Reasoning type questions; SA; LA; Source-based/ Case-based/ Passage-based/ Integrated assessment questions.
- An internal choice of approximately 33% would be provided.

Internal Assessment (20 Marks)

- **Periodic Assessment** - 05 marks + 05 marks
- **Subject Enrichment** (Practical Work) - 05 marks
- **Portfolio** - 05 marks

Suggestive verbs for various competencies

- **Demonstrate Knowledge and Understanding**

  State, name, list, identify, define, suggest, describe, outline, summarize, etc.

- Application of Knowledge/Concepts

  Calculate, illustrate, show, adapt, explain, distinguish, etc.

- Formulate, Analyze, Evaluate and Create

  Interpret, analyze, compare, contrast, examine, evaluate, discuss, construct, etc.

CHAPTER – 1-CHEMICAL REACTIONS AND EQUATIONS

VOLUME – 1

Q.NO.	QUESTION
Q1.	Balanced form of hydrogen + oxygen → water is: a) $H_2 + O_2 \rightarrow H_2O$ b) $2H_2 + O_2 \rightarrow 2H_2O$ c) $H_2O \rightarrow H_2 + O_2$ d) $2H_2O \rightarrow 2H_2 + O_2$ **Answer: b**
Q2.	Which is a combination reaction? a) $CaO + H_2O \rightarrow Ca(OH)_2$ b) $CaCO_3 \rightarrow CaO + CO_2$ c) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$ d) $FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$ **Answer: a**
Q3.	Which of the following is the chemical formula of quick lime? a) $CaCO_3$ b) CaO c) $Ca(OH)_2$ d) CuO **Answer: b**
Q4.	Which of the following is the chemical formula of Slaked lime? a) $CaCO_3$ b) CaO c) $Ca(OH)_2$ d) CuO **Answer: c**
Q5.	When carbon dioxide is passed through lime water, (a) Calcium hydroxide is formed (b) A white precipitate of CaO is formed (c) Lime water turns milky (d) Color of lime water disappears. **Answer: (c) Lime water turns milky**
Q6.	On immersing an iron nail in $CuSO_4$ solution for few minutes, you will observe (a) no reaction takes place (b) the color of the solution fades away (c) the surface of iron nails acquire a black coating (d) the color of the solution changes to green **Answer: (d) the color of the solution changes to green**
Q7.	Reaction between potassium iodide and lead nitrate forms $PbI_2 + KNO_3$. This is a type of- a) Combination reaction b) Decomposition reaction c) Double displacement (precipitation) reaction d) Oxidation-reduction reaction ***Answer: c***
Q8.	What type of reaction is $CuO + H_2 \rightarrow Cu + H_2O$? a) Neutralization b) Decomposition

c) Redox
d) Combustion
Answer: c

Q9. Identify the substance getting oxidised in the following reaction.
$2\ PbO(s) + C(s) \rightarrow 2Pb\ (s) + CO_2(g)$
(a) PbO
(b) C
(c) Pb
(d) CO_2
Answer: (b)

Q10. Which gas is used to prevent **rancidity in chips**?

a)Oxygen
b) Nitrogen
c) Carbon dioxide
d) Helium

Answer: b

Q11. Fatty foods become rancid due to the process of
(a) oxidation
(b) corrosion
(c) reduction
(d) hydrogenation
Answer: (a) oxidation

Q12. In which of the following, heat energy will be evolved?
(a) Electrolysis of water
(b) Dissolution of NH4Cl in water
(c) Burning of L.P.G.
(d) Decomposition of AgBr in the presence of sunlight
Answer: (c) Burning of L.P.G.

VERY SHORT ANSWER TYPE QUESTION (2 marks)

Q13. Write balanced chemical equations for the following chemical reactions and also mention its type:
Iron + Copper Sulphate → Iron Sulphate + Copper

OR

An iron nail was put into a solution of copper sulphate kept in a glass container. It was found that blue colour of the solution changed gradually with the passage of time. After a few days when iron nail was taken out of the solution, a brown layer was observed on it. Why does the change took place? Write a balanced chemical equation.
Answer: $Fe_{(s)} + CuSO_{4(aq)} \rightarrow FeSO_{4\ (aq)} + Cu_{(s)}$
It is a displacement reaction in which one element replaces another element within a compound.

Q14. Differentiate between decomposition and combination reaction.

OR

Decomposition reactions are called the opposite of combination reactions. Explain using examples.
Answer:

COMBINATION REACTIONS	**DECOMPOSITION REACTIONS**
In a combination reaction two reactants are combining to create one product.	A single compound breaks down to produce two or more simpler substances.
Generally exothermic	Generally endothermic
For example: $H_2(g) + O_2(g) \rightarrow H_2O(l)$	For example- $2H_2O\ (l) \xrightarrow[\text{(decomposition)}]{\text{Electricity}} 2H_2\ (g) + O_2\ (g)$ (Water)

Q15. Differentiate between displacement and double displacement reaction.

OR

A student conducts two experiments in the laboratory. A strip of iron is placed into 50 mL of copper sulphate solution. In other experiment, 50 mL solution of Lead nitrate is mixed with 50 mL of potassium iodide solution in another beaker. What will happen in both these experiments. State the type of reaction that takes place in each case.

Ans.

DISPLACEMENT REACTION	**DOUBLE DISPLACEMENT REACTION**
In this reaction, one element replaces another element within a compound.	In this reaction, two compounds exchange ions, resulting in the formation of two new compounds
$Fe_{(s)} + CuSO_{4(aq)} \rightarrow FeSO_{4\,(aq)} + Cu_{(s)}$ Iron Copper sulphate Iron sulphate Copper (Blue) (Green)	$Pb(NO_3)\,(aq) + KI_2\,(aq) \rightarrow PbI_2(s) + KNO_3\,(aq)$ Lead Nitrate Potassium iodide Lead Nitrate Potassium iodide (Colourless) (Colourless) (Yellow ppt)

Q16. What do you mean by a precipitation reaction? Explain by giving examples.

OR

Two colourless solutions of Silver Chloride and Potassium Chloride were mixed. The resulting solution became white coloured. Explain.

Answer: Precipitation reaction is a type of reaction in where soluble reactants combine to form an insoluble solid called a precipitate.

For ex- $AgNO_{3\,(aq)} + KCl_{(aq)} \rightarrow AgCl_{(s)} + KNO_{3(aq)}$

(White ppt)

Q17. Define rusting. How it can be prevented?

OR

Why do we apply paint on iron articles?

Answer: Rusting is a chemical process where iron corrodes due to oxidation when exposed to oxygen and moisture. Paint does not allow iron articles to come in contact with air, water and saves iron articles from rusting.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

Q18. A solution of a substance 'X' is used for white washing.

(i) Name the substance 'X'

(ii) Write its chemical formula.

(iii) Write the reaction of the substance 'X' named in (i) above with water.

Answer: (i) The substance whose solution in water is used for white washing is calcium oxide (or quick lime).

(ii)Its formula is CaO.

(iii) $CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$

Q19. Define Decomposition reaction. Give one example each of decomposition reaction where light, heat and electricity is used.

OR

Decomposition reactions require energy either in the form of heat or light or electricity for breaking down the reactants. Write one equation each for decomposition reactions where energy is supplied in the form of heat, light and electricity.

Answer: : In a decomposition reaction, a single compound breaks down to produce two or more simpler substances.

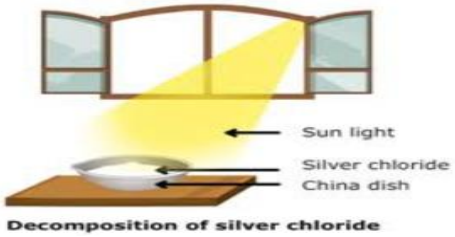
$$\underset{\text{Calcium carbonate}}{CaCO_3(s)} \xrightarrow{\text{Heat}} CaO(s) + CO_2(g)$$

$$\underset{\text{Silver bromide}}{2AgBr(s)} \xrightarrow{\text{Light}} 2Ag(s) + Br_2(g)$$

$$\underset{\text{Water}}{2H_2O(l)} \xrightarrow{\text{Electricity}} 2H_2(g) + O_2(g)$$

Q20. Lead nitrate solution is added to a test tube containing potassium iodide solution.
(a) Write the name and colour of the compound precipitated.
(b) Write the balanced chemical equation for the reaction involved.
(c) Name the type of this reaction.
Answer: (a) yellow precipitate of lead iodide is formed.
(b) $Pb(NO_3)_{2(aq)} + 2KI_{(aq)} \longrightarrow \underset{\text{(Yellow ppt.)}}{PbI_{2(s)}\downarrow} + 2KNO_{3(aq)}$
(c) precipitation reaction and double displacement reaction.

Q21. 2 g of silver chloride is taken in a China dish and the China dish is placed in sunlight for sometime. What will be your observation in this case? Write the chemical reaction involved in the form of a balanced chemical equation. Identify the type of chemical reaction.



Decomposition of silver chloride

Answer: Silver chloride will change into slightly grey or black colour
$2AgCl(s) \rightarrow 2Ag(s) + Cl_2(g)$
It is a Photo chemical decomposition

<u>Q22.</u> **Q19.** Differentiate between exothermic reaction and endothermic reaction. Give examples.

OR

Rahul conducts two experiments using a polystyrene cup and a thermometer:

- **Experiment A**: He adds **calcium oxide (quick-lime)** to water.
- **Experiment B**: He dissolves **ammonium chloride** in water.

a. Describe what Rahul observes in terms of temperature changes during each experiment.
b. Determine which reaction is **exothermic** and which is **endothermic** and why?

c. Give an example of exothermic and endothermic reaction other than these.

Ans.

EXOTHERMIC REACTION	ENDOTHERMIC REACTION
These reactions release energy, usually as heat	These reactions absorb energy from the surroundings
Makes the surroundings warmer	Causes the surroundings to cool down
For ex- 1. $CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$ +Heat 2. Burning of a candle 3. Process of respiration.	For ex - 1. $\underset{\text{Calcium carbonate}}{CaCO_3(s)} \xrightarrow{\text{Heat}} CaO(s) + CO_2(g)$ 2. Melting of ice 3. dissolving ammonium chloride in water.

LONG ANSWER TYPE QUESTION (5 MARKS)

Q23. What happens when food materials containing fats and oils are left for a long time? Enlist any two changes that take place. Suggest two ways by which this phenomenon can be prevented.

Answer: Rancidity is the process where fats and oils in food oxidize

Changes that takes place in the food:

1. Change in smell
2. Change in taste

Methods of Prevention:

1. Vacuum packing,
2. Refrigeration of food materials,
3. Placing of food materials, away from direct sunlight.

Q24. 1. Translate the following statements into chemical equations and then balance them.

a) Hydrogen gas combines with nitrogen to form ammonia.

b) Hydrogen sulphide gas burns in air to give water and Sulphur dioxide.

c)Calcium hydroxide + Carbon dioxide -> Calcium carbonate + Water

Ans:

a)$3H_2+N_2 \rightarrow 2NH_3$

b)$2H_2S+3O_2 \rightarrow 2H_2S+2SO_2$

c) $Ca(OH)_2+ CO_2 \rightarrow CaCO_3+ H_2O$

2. Oil and fat containing food items are flushed with nitrogen. Why?

Ans: Nitrogen, being an inert gas acts as an antioxidant prevent the rancidity of food items with oils and fats.

Q25. 1. In the reaction $MnO_2+4HCl \rightarrow MnCl_2+H_2O+Cl_2$

a) Name the substance oxidised.

Ans: HCl is oxidised to Cl_2 .

b) Name the oxidising agent.

Ans: MnO_2

c) Name the reducing agent and the substance reduced.

Ans: The reducing agent is HCl and here, MnO_2 is oxidised to $MnCl_2$.

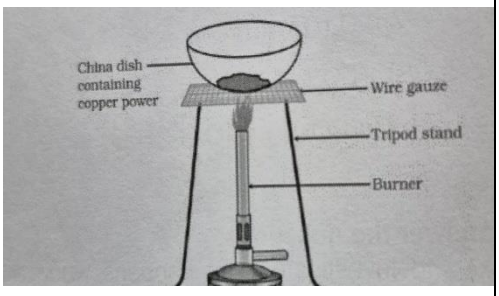
2. Why is a Combustion reaction an oxidation reaction?

Ans: because it is always carried out in the presence of oxygen and oxygen is added to a compound. For example,

$CH_4+O_2 \rightarrow CO_2+H_2O$

CASE BASED QUESTIONS

Q26. Meena heats a small amount of powder of metal 'X' in a China dish over a Bunsen burner. Initially, the powder appears reddish brown. After heating, the surface of the metal powder becomes coated with a black substance 'Y'.



(a) Identify X and Y.

(b) Why is the black substance formed?

(c) Write the chemical equation of the chemical reaction that takes place and mention its type.

OR

How can the black coating on the surface be turned reddish brown?

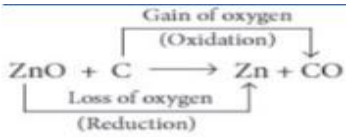
Answer: (a) X- Copper (Cu), Y- Copper oxide (CuO)

(b) The black substance (CuO) is due to oxidation of copper.

$$2Cu_{(s)} + O_{2(g)} \longrightarrow \underset{\text{Black}}{\underset{\text{Copper oxide}}{2CuO_{(s)}}}$$

Redox reaction

OR

	The black coating on the surface can be turned reddish brown by passing hydrogen gas over the hot copper oxide. $CuO_{(s)} + H_{2(g)} \longrightarrow \underset{\text{Reddish brown}}{Cu_{(s)}} + H_2O$
Q27.	**The earlier concept of oxidation and reduction is based on the addition or removal of oxygen or hydrogen elements so, in terms of oxygen and hydrogen, oxidation is addition of oxygen to a substance and removal of hydrogen from a substance. On the other hand, reduction is addition of hydrogen to a substance and removal of oxygen from a substance. The substance which gives oxygen to another substance or removes hydrogen from another substance in an oxidation reaction is known as oxidising agent, while the substance which gives hydrogen to another substance or removes oxygen from another substance in a reduction reaction is known as reducing agent.**  ZnO - Oxidising agent C - Reducing agent a) **Name the substance getting oxidised in the following reaction.** $H_2S + Cl_2 \longrightarrow S + 2HCI$ **Ans.** H_2S b) Identify the correct oxidising agent and reducing agent in the following reaction. $Fe_2O_3 + 2AI \longrightarrow 2Fe + Al_2O_3$ **Ans.** Fe_2O_3 - Oxidising agent, Al - Reducing agent c) **Oxidation and reduction reaction always occurs together/ simultaneously. Comment/Justify.** **OR** **How oxidation is different from reduction.** **Ans. Yes,** because For one substance to lose O or H, another substance must accept it, hence the paired nature of these reactions. **OR** **Oxidation – Gain of Oxygen or loss of hydrogen** **Reduction- Gain of hydrogen or loss of Oxygen**

CHAPTER-2- ACIDS, BASE AND SALTS

VOLUME -1

Q. No.	MCQs
1	An aqueous solution 'A' turns phenolphthalein solution pink. On addition of an aqueous solution 'B' to 'A', pink colour disappears. Which of the statement is true for solution 'A' and 'B'? a) A is strongly basic and B is weak base b) A is strongly acidic and B is weak acid. c) A has pH greater than 7 and B has pH less than 7. d) A has pH less than 7 and B has pH greater than 7. Ans. - c) A has pH greater than 7 and B has pH less than 7.
2	Select a pair of olfactory indicators from the following: a) Clove oil and turmeric b) Onion juice and lemon c) Vanilla essence and clove oil d) Litmus and methyl orange Ans. - c) Vanilla essence and clove oil
3	The acid present in nettle plant is: a) Tartaric acid b) Oxalic acid c) Methanoic acid d) Lactic acid Ans.- c) Methanoic acid
4	Select the molecule with maximum number of water of crystallisation: a) Baking soda b) Gypsum c) Washing soda d) Hydrated copper sulphate Ans.- c) Washing soda
5	Which gas is produced when a metal reacts with dilute HCl? a) CO_2 b) Cl_2 c) O_2 d) H_2 Ans- d) H_2
6	Which of the following is an organic acid? a) Hydrochloric acid b) Nitric acid c) Sulphuric acid d) Acetic acid Ans- d) Acetic acid
7	Identify the chemical formula of washing soda: a) $NaHCO_3$ b) $Na_2CO_3.5H_2O$ c) $Na_2CO_3.10H_2O$ d) NaOH Ans- c) $Na_2CO_3.10H_2O$
8	Identify the pair of weak acids: a) HCl, CH_3COOH b) HNO_3, HCl c) H_2SO_4, HNO_3 d) CH_3COOH, H_2CO_3 Ans- d) CH_3COOH, H_2CO_3
9	Which of the following is a natural indicator? a). Methyl orange b). Phenolphthalein c). Turmeric d). Bromothymol blue

	Ans- c) Turmeric
10	The pH of a neutral solution is: a) 0 b) 7 c)14 d) Between 7 and 14 Ans- b) 7
	ASSERTION REASON QUESTIONS In each of the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below: a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d)A is false but R is true.
11	**Assertion (A):** Metallic oxides are basic in nature. **Reason (R):** MgO is a metallic oxide. Ans- (a) Both A and R are true, and R is the correct explanation of A
12	**Assertion (A):** When dry blue litmus paper is exposed to dry HCl gas it turns red. **Reason (R):** Blue litmus turn red in presence of an acid. Ans- (d) A is false, but R is true.
	VERY SHORT ANSWER TYPE QUESTIONS
13	Define neutralization reaction with an example. OR How does a neutralization reaction take place? Ans- A neutralization reaction is a chemical reaction in which an acid and a base react to form a salt and water. $HCl\ (aq) + NaOH\ (aq) \rightarrow NaCl\ (aq) + H_2O\ (l)$
14	The pH of a solution of an edible liquid is 4.6. How is the juice likely to be in taste? Also mention the nature of liquid (acidic/basic/neutral). Ans- A solution with a pH of 4.6 is likely to taste sour and is acidic. A pH value below 7 indicates acidic nature.
15	Why do acid not show acidic behaviour in the absence of water? Ans- In the absence of water, acids do not dissociate to produce H + ions.
16	How is the concentration of H3O+ ions affected when acid is diluted with water? Ans- When an acid is diluted with water, the concentration of H3O+ ions decreases.
17	Write an equation to show the reaction between Plaster of Paris and water. Ans- $CaSO_4.1/2H_2O + 1.1/2\ H_2O \rightarrow CaSO_4\ .2H_2O$
	SHORT ANSWER TYPE QUESTIONS
18	Why it is advised to take precautions while mixing acid with water? OR Why care should be taken during acid dilution? Ans- It is crucial to take precautions when mixing acid with water because the reaction is highly exothermic and it releases a lot of heat. If water is added to concentrated acid, the heat generated can cause the mixture to boil and splash, causing severe burns.
19	Define water of crystallization. Give 2 examples of compound with water of crystallization. Ans- Water of crystallization refers to the fixed number of water molecules that are chemically bound within a crystal structure of a compound. Examples – copper (II) sulphate pentahydrate ($CuSO_4 \cdot 5H_2O$) and gypsum ($CaSO_4 \cdot 2H_2O$).

20	Which gas is released when acid reacts with metal? Write a test for the gas. Ans- When a metal reacts with an acid, the gas released is hydrogen gas. A common test for hydrogen gas is to bring a burning matchstick near the gas. If the gas burns with a "pop" sound, it confirms the presence of hydrogen.
21	How baking soda differ from baking powder? Ans- Baking soda is a single compound which has sodium hydrogen carbonate which is alkaline basic in nature. Baking powder is a mixture of sodium hydrogen carbonate and a mild edible acid such as tartaric acid.
22	Explain the working of antacid in getting relieve from acidity. OR Explain how antacids help maintain the pH balance in the stomach. Ans- Antacids provide relief from acidity by neutralizing excess stomach acid. They contain bases that react with the hydrochloric acid produced in the stomach, reducing its acidity.
	LONG ANSWER TYPE QUESTIONS
23	Give reasons: (i) Use of mild base like baking soda provides relief on the areas stung by a honeybee. Ans- Bee sting leaves Methanoic acid which causes pain and irritation. Use of mild base like baking soda on the sting area gives relief. ii) The colour of copper sulphate crystals changes to white on heating. Ans- The blue color of copper sulphate crystals (CuSO4·5H2O) changes to white upon heating because the water molecules trapped within the crystal structure, known as water of crystallization, are moved out. iii) A solution of baking soda turns red litmus blue. Ans- Baking Soda is a mild base and it turns red litmus paper blue.
24	A white powder is used by doctors to support fractured bones (i) Write the name and chemical formula of the powder. Ans- Plaster of Paris. Its chemical formula is $CaSO_4 \cdot \frac{1}{2}H_2O$ (ii) How is this powder prepared? Ans- $CaSO_4 \cdot 2H_2O \rightarrow CaSO_4 \cdot (1/2)\ H_2O + 1.1/2H_2O$ (iii) Give one more use of this powder. Ans- In making of pottery and decorative items.
25	i) Write the chemical equation involved in chlor- alkali process? Ans- $2NaCl + 2H_2O$ --□ $2NaOH + Cl_2 + H_2$ ii) What is the substance that are formed at anode and cathode in chlor- alkali process? Ans- At anode chlorine gas and at cathode hydrogen gas are formed. iii) What are the uses of chlorine? Ans- Used for water treatment and pesticides. iv) a. Where does the sodium hydroxide solution is formed? Ans- It is formed near the cathode. b. What are the uses of Sodium hydroxide? Ans- Uses in making soaps and detergents.
	CASE BASED QUESTIONS
26	Rohit observed that his mother used baking soda to clean kitchen tiles and utensils. Curious, he read on the packet that baking soda is chemically sodium hydrogen carbonate ($NaHCO_3$). He also found out that lemon juice is used to remove stains

	and has a sour taste due to the presence of citric acid. He wanted to know how acids and bases interact in daily life and decided to do an experiment by mixing both. 1. Name the type of chemical reaction that occurs when baking soda is mixed with lemon juice. Ans- The reaction between baking soda (sodium bicarbonate) and lemon juice (citric acid) is neutralization reaction. 2. What is the pH range of lemon juice? Ans- The pH range of lemon juice is typically between 2 and 3. 3. (i) What gas is evolved when baking soda reacts with lemon juice? **OR** (ii) How can the evolved gas be tested? Ans- 3. (i) Carbon dioxide. (ii) The presence of carbon dioxide can be tested by bubbling the gas through limewater, which will turn milky.
27	Priya noticed that common salt (NaCl) is used in cooking, in medicines, and in factories. In her science class, she learned about its production by the neutralization reaction and its use as a raw material in preparing many chemicals like bleaching powder, baking soda, and washing soda. 1. What is the chemical formula of bleaching powder? Ans- $CaOCl_2$ 2.How is bleaching powder prepared? $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$ 3.(i) How is common salt formed? Ans- Common salt (NaCl) is typically formed by the neutralization reaction between an acid and a base. **OR** (ii) Write the reaction involved. Ans-. One of the most common methods for producing NaCl is by reacting hydrochloric acid (HCl) with sodium hydroxide (NaOH). HCl+NaOH→NaCl+H2O

CHAPTER-3- METALS AND NON-METALS

VOLUME -1

Q1.	Which property is characteristic of metals? a) Brittle b) Ductile c) Non-conductive d) Non-lustrous Answer: b) Ductile
Q2.	Which metal is the best conductor of electricity? a) Iron b) Copper c) Zinc d) Aluminum Answer: b) Copper
Q3.	What happens when a metal reacts with an acid? a) It forms a salt and water b) It forms a salt and hydrogen gas c) It forms an oxide and water d) It forms an oxide and hydrogen gas Answer: b) It forms a salt and hydrogen gas
Q4.	Which gas is produced when a metal reacts with an acid? a) Oxygen b) Hydrogen c) Nitrogen d) Carbon dioxide Answer: b) Hydrogen
Q5.	Which of the following is a non-metal? a) Copper b) Iron c) Zinc d) Carbon Answer: d) Carbon
Q6.	Which metal is used in making jewelry due to its lustrous appearance? a) Iron b) Copper c) Gold d) Aluminum Answer: c) Gold
Q7.	Which metal is used in electrical wiring? a) Iron b) Copper c) Zinc d) Aluminum Answer: b) Copper
Q8.	Which metal is used in making machinery due to its strength and durability? a) Iron b) Copper c) Zinc d) Aluminum Answer: a) Iron
Q9.	Which of the following is a metal? a) Carbon b) Oxygen c) Copper d) Nitrogen Answer: c) Copper
Q10.	What happens when a metal reacts with oxygen? a) It forms a salt

	b) It forms an oxide c) It forms an acid d) It forms a base Answer: b) It forms an oxide
	ASSERTION REASON QUESTIONS In each of the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below: a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.
Q11.	**Assertion:** Metals are good conductors of electricity. **Reason:** Metals have free electrons that can move freely. Answer: (a). Both assertion and reason are true, and the reason is the correct explanation of the assertion
Q12	**Assertion:** Non-metals are dull and non-lustrous. **Reason:** Non-metals have a low melting point. Answer: (c).The assertion is true, but the reason is false. Non-metals are dull and non-lustrous due to their electronic configuration
	VERY SHORT ANSWER TYPE QUESTIONS
Q13	Name the non-metal that can melt with heat of our palm? Ans- Gallium
Q14	Name a reducing agent that may be used to obtain manganese from manganese dioxide. Ans- Aluminium powder
Q15	Give an example metal and acid reaction Ans- Metals react with acids to form salt and hydrogen gas. Example: $Zn + 2HCl \rightarrow ZnCl_2 + H_2$
Q16	What is the difference between metals and non-metals in terms of appearance? Ans- Metals are shiny and lustrous, while non-metals are dull and non-lustrous.
Q17	Name an alloy of lead and tin. Ans- Solder
	SHORT ANSWER TYPE QUESTIONS
Q18	What are the differences between metals and non-metals in terms of their physical properties? Ans- Metals are shiny, malleable, and ductile, while non-metals are dull, brittle, and non-ductile.
Q19	How do metals react with oxygen? Give an example Ans- Metals react with oxygen to form metal oxides. Example: $2Mg + O_2 \rightarrow 2MgO$.
Q20	What is the reactivity series of metals? Explain its significance. Ans- The reactivity series is a list of metals in order of their reactivity. It helps predict which metals will react with acids or other substances.
Q21	Describe the uses of metals in everyday life. Give examples. Ans- Metals are used in making machinery, electrical wires, and jewelry due to their strength, conductivity, and durability. Examples: Copper in electrical wiring, Iron in machinery.
Q22	How do non-metals react with acids? Give an example. Ans- Non-metals do not typically react with acids, but some may react under specific conditions. Example: Carbon reacts with nitric acid to form carbon dioxide.
	LONG ANSWER TYPE QUESTIONS
Q23	Describe four physical properties of ionic compounds and covalent compounds. Ans-

Ionic compounds	Covalent compounds
Exist as solid at room temperature.	Exist as solid, liquid or gas.
High m.p. and b.p.	Low melting and boiling point.

	Conduct electricity in aquous or molten state.	Do not conduct electricity at any state.	
	Dissolve in polar solvents like water but non in non-polar or organic solvents.	Dissolve in non-polar or organic solvents but not in polar solvents.	

Q24

State three reasons for the following.

i) Believing that sodium is metal

ii) Sulphur is non-metal

Ans- i) Sodium is a metal because it has luster, loses electrons easily and conducts electricity like all other metals.

ii. Sulphur is a non-metal because it is neither malleable nor ductile, it does not conduct heat and electricity and it does not lose electrons easily.

Q25

Enumerate the steps of extraction of metals from its ores in general.

Ans- Steps of Extraction

1. Mining: Extraction of ore from the earth through mining.
2. Crushing and Grinding: Crushing and grinding the ore into smaller pieces to increase surface area.
3. Concentration: Separating the metal-bearing minerals from impurities through various methods (e.g., flotation, magnetic separation).
4. Roasting: Heating the concentrated ore in the presence of air to convert sulfides to oxides.
5. Smelting: Heating the roasted ore with a reducing agent (e.g., carbon) to extract the metal.
6. Refining: Purifying the extracted metal through various methods (e.g., electrolysis, distillation).

These steps may vary depending on the type of metal and ore being extracted.

CASE BASED QUESTIONS

Q26

Metals are the elements which are often found in nature in combined form (as ores) but few metals occur in free state too. Metals possess such specific properties which make them very useful in practical life. The properties shown by them are lustrous surface, they can also be polished for obtaining a highly reflective surface, hard and strong in nature, good conductor of heat and electricity and also malleable and ductile. But few metals are exceptionally different too in some properties like Sodium and Potassium are exceptional cases in this case as they can be cut with knife. Metallic elements possess high melting and boiling points too.

1.Name a metal which is the most abundant in earth crust?

Ans- Al

2.Name a metal which is poor conductor of heat.

ANS- Pb

3.i) Name a Metal with highest melting point:

Ans- Tungsten

ii). Bauxite is an ore of:

Ans-Al

Q27

Non-metals are the elements which forms negatively charged ions by accepting electrons. They usually have 4,5,6 or 7 valence electrons in their outermost shell. They lack lustre and are poor conductors of heat and electricity. They are good insulators and are mostly gases, few solid and one liquid at room temperature.

1.Why chlorides of non-metals are covalent.

2. Name a lustrous non-metal.

3.i)Name A non-metals which is liquid at room temperature.

ii) Name a solid non-metal.

Ans-1. They share electrons.

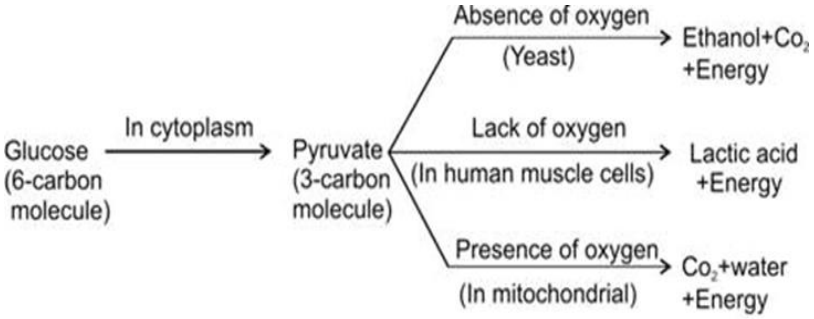
2. Iodine

3.i) Bromine ii) Carbon

	CHAPTER-5- LIFE PROCESSES VOLUME-01
QNO.	MULTIPLE CHOICE QUESTIONS
1	The role of chlorophyll in photosynthesis is for- I. Absorbing light II. Breaking down water molecule III. No function IV. Reduction of CO_2 Ans- I. Absorbing light
2	Temporary finger like extensions made by Amoeba are called I. Cell membrane II. Cell wall III. Pseudopodia IV. Cilia Ans- III. Pseudopodia
3	Bile juice is secreted by I. Stomach II. Pancreas III. Small intestine IV. Liver Ans- IV. Liver
4	Respiratory pigment in human body is I. Chlorophyll II. Water III. Blood IV. haemoglobin Ans- IV. haemoglobin
5	Which of the following is not a component of blood- I. Lymph II. Platelets III. Plasma IV. WBC Ans- I. Lymph
6	One cell-thick vessels are called I. Arteries

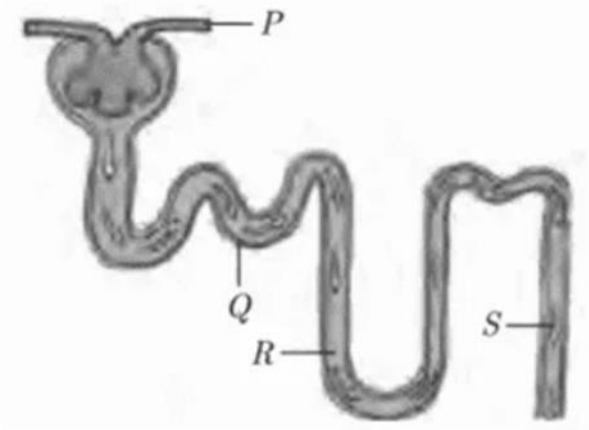
	II. Veins III. Capillaries IV. Pulmonary artery Ans- III. Capillaries
7	Which of the following is not a part of nephron? I. PCT II. DCT III. Loop of Henle IV. Ureter Ans- IV. Ureter
8	. Lipase acts on I. Amino acids II. Fats III. Carbohydrates IV. All of these Ans- II. Fats
9	Which of these enzymes are secreted by pancreas? I. Trypsin II. Pepsin III. Carboxypeptidase IV. Both I and II Ans- I. Trypsin
10	Cuscuta is a total plant parasite because- I. It lacks chlorophyll II. It has special roots to suck cell sap III. It feeds on insects IV. Both I and II Ans- IV. Both I and II
	ASSERTION REASON QUESTIONS- There are two statements, one labelled as Assertion(A) and the other labelled as Reason (R). Answer these questions selecting the appropriate option given below- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true and R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true
11	Assertion: Cuscuta is devoid of chlorophyll. Reason: Cuscuta is a total plant parasite.

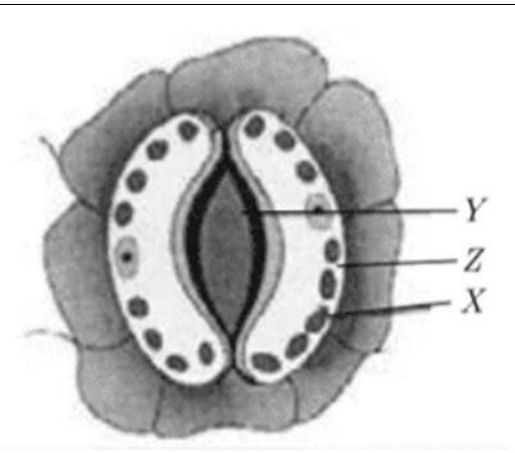
	Ans- a) Both A and R are true and R is the correct explanation of A.
12	Assertion: Ascent of sap is due to transpirational pull and root pressure. Reason: Food prepared during photosynthesis is transported by this process. Ans- c) A is true but R is false.
	VERY SHORT ANSWER TYPE QUESTIONs
13	"The breathing cycle is rhythmic whereas exchange of gases is a continuous process". Justify this statement// Comment// Why do the lungs always have some residual volume of air in them? Ans- Breathing involves inhalation followed by exhalation. Gaseous exchange in alveoli occurs continuously as residual volume of air is present in alveoli all the time.
14	Give reasons for the following: //Why - The small intestine of carnivores is smaller than that of herbivores. Ans- Carnivores eat flesh which is easy to digest whereas herbivores eat plants which is rich in cellulose. It is difficult to digest. So, herbivores have a longer small intestine to increase surface area for complete digestion.
15	State the main function of arteries. Why do they have thick and elastic walls? // Mention two points of differences which make arteries different from veins. Ans- Arteries except pulmonary artery carry pure/oxygenated blood. Blood moves with great pressure in arteries, to avoid bursting or arteries they have thick elastic walls.
16	Give reasons for the following // Why do- (2 marks each) (a) Walls of trachea are supported by cartilage rings. (b) Respiratory pigment- hemoglobin is required for transportation of gases. (c) Breathing rate of aquatic organisms is much faster than that of terrestrial organisms. Ans- (a)So that the walls of trachea do not collapse when there is no air in it. (b) As diffusion pressure is not sufficient to supply O_2 to all the cells so respiratory pigment is required which carries O_2 to cells. (c) Aquatic organisms take dissolved oxygen which is much less than atmospheric oxygen which is taken by terrestrial organisms. So, to meet the demand of oxygen aquatic organism breathe at a faster rate.
17	"Digestion of fats will take months if bile juice is not secreted by liver". Justify this statement//Comment.// What is the role of bile juice in the digestion of fats? Ans- Bile helps in emulsification of fats which increase the surface area. This allows faster action of enzyme lipase on fats.
	SHORT ANSWER TYPE QUESTIONS
18	In human alimentary canal, name the site of complete digestion of various components of food. Write the end products of digestion of carbohydrates, fats and proteins. Explain the role of saliva in the process of digestion in mouth. Ans- Small intestine

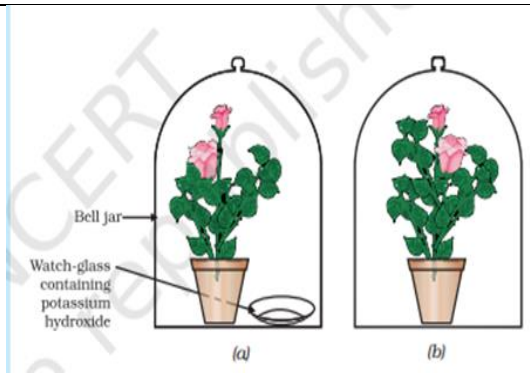
	Carbohydrates- glucose Fats- fatty acids and glycerol Proteins- amino acids Saliva has salivary amylase to break down starch into maltose
19	Schematically explain the process of breakdown of glucose in a cell// Depict in a flow chart the processes involved in breakdown of glucose in a cell  Ans- **(Break down of glucose by various pathways)**
20	What is double circulation in human beings? Why is it necessary? // Why is double circulation important in warm blooded organisms? And how ? Ans- In double circulation blood reaches twice to heart in one cycle (as pulmonary and systemic circulation). It prevents mixing of pure and impure blood. So, more oxygen reaches the cells and more energy is produced. This is needed to maintain constant body temperature.
21	a) What is meant by ascent of sap and translocation of food? // Define. b) How are these processes different from each other? // Differentiate between ascent of sap and translocation of food. Ans- a) Ascent of sap is the upward movement of water and minerals through xylem in plants against gravity. Translocation of food is the transport of photosynthate from leaf to all parts of plants through phloem. c) Any one point of difference -

Ascent of sap	Translocation of food
Water and minerals are transported	Food prepared during photosynthesis is transported
Xylem vessels and tracheids are involved	Phloem sieve tubes are involved
Upwards movement against gravity occurs	Bidirectional movement occurs from leaves

22	Mention three strategies by which wastes are eliminated by the plants? // Do plants have an excretory system? How do these perform excretion? // Plants make their food so they have minimum waste produced. How do the plants get rid of these wastes? Ans- 1. Plants can get rid of excess water by transpiration. 2. Many plant waste products are stored in cellular vacuoles.

	3. Waste products may be stored in leaves that fall off. 4. Other waste products are stored as resins and gums, especially in old xylem. 5. Plants also excrete some waste substances into the soil around them. (any 3 points) (1*3)
	LONG ANSWER TYPE QUESTIONS
23	1. (a) Name the process by which autotrophs prepare their own food. (b) List the three events which occur during this process. (c) Write the balanced chemical equation for the process of photosynthesis in green plants. Ans- (a) Photosynthesis (b) Absorption of light energy by chlorophyll. Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen. Reduction of CO_2 into carbohydrate. © $6CO_2 + 12H_2O$—sunlight &chlorophyll-----$C_6H_{12}O_6 + 6O_2 + 6H_2O$
24	(a) Define excretion. What are the two organs in human beings that act as accessory excretory organs? (b) Explain the steps involved in urine formation. // Label P, Q, R, S. Mention which part is responsible for three main steps involved in urine formation.  Ans- (a) Excretion is the process of eliminating nitrogenous wastes from body. Skin and liver (b) Three steps – (i) Glomerular filtration of blood. (ii) Reabsorption of useful substances by PCT. (iii) Secretion by PCT and DCT . P- glomerulus, Q- PCT, R- Henle's loop, S- Collecting tubule
25	How do stomata open and close? Differentiate between desert plants and other plants on basis of stomatal opening and closure. Why is the difference in opening and closing of stomata? //

	 Label parts X, Y and Z. Explain the role of Z in opening and closing of stomata. Ans- The opening and closing of the pore is a function of the guard cells. The guard cells swell when water flows into them, causing the stomatal pore to open. Similarly, the pore closes if the guard cells shrink. Stomata open at night in desert plants to reduce transpiration. In other plants, stomata open at day time and close at night time to allow CO_2 and O_2 to enter into the cells. // X- chloroplast, Y-stomata, Z- guard cell
	CASE BASED QUESTIONS
26	1. Renu always eats junk food out and suffers from acidity. She was eating antacids to reduce the effect of hyper acidity when Aasfaq came. Renu asked her doubts about acidity to her. Considering yourself as Aasfaq answer the following questions of Renu- a) (i)Why does a person suffer from acidity? OR (ii) Why is acid produced in stomach? b) Why the stomach walls do not get damaged by the acid produced in stomach? c) Name the acid and the gland which produces this acid. Ans- a) (i) Hyper production of HCl in stomach causes acidity. OR (ii) Acidity kills the harmful microbes' hat have entered with food and creates acidic environment to activate pepsin. b) Due to mucus coating c) Hydrochloric acid by gastric glands.
27	Two potted plants were kept in dark for 72 hours and then in sunlight in the given set up-



a) (i) What happens in bell jar A after few hours? How can this be tested in laboratory?

OR

(ii) What happens in bell jar B after few hours? How can this be tested in laboratory?

b) What is the role of potassium hydroxide in this experiment?

c) Write the aim of the above experiment.

Ans- a) (i) No photosynthesis occurs. No starch is produced which can be observed by doing iodine test. (1+1)

OR

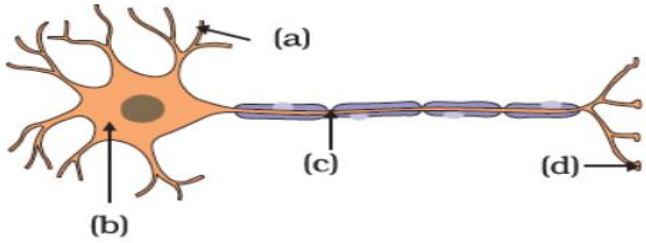
(ii) Photosynthesis occurs. Starch is produced which can be observed by doing iodine test.

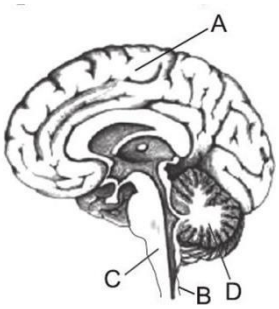
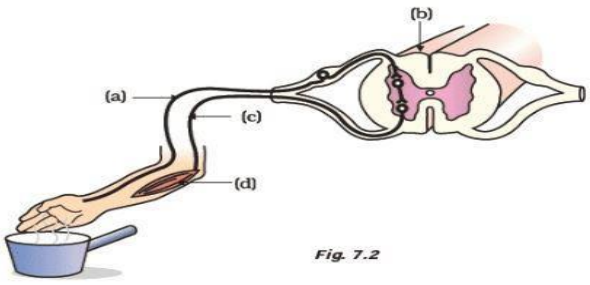
b) Absorbs CO_2

c) To show CO_2 is necessary for photosynthesis.

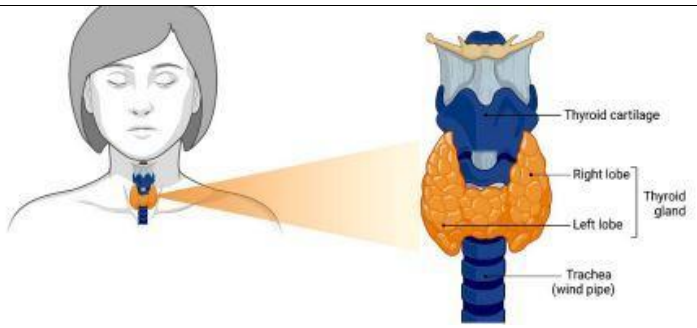
	CHAPTER -6- CONTROL AND COORDINATION(VOLUME-1)
Q.NO.	**Multiple Choice Questions (MCQ).**
Q1.	**The electrical impulse travels in a neuron from:** a. Dendrite → axon → axonal end → cell body b. Cell body → dendrite → axon → axonal end c. Dendrite → cell body → axon → axonal end d. Axonal end → axon → cell body → dendritens
Q2.	**Which of the following statements is true?** **i**.Sudden action in response to something in the environment is called reflex action. **ii**.Sensory neurons carry signals from the spinal cord to muscles. **iii**.Motor neurons carry signals from receptors to the spinal cord. **iv**.The path through which signals are transmitted from a receptor to a muscle or a gland is called the reflex arc. **a** 1 and 2 **b.** 1 and 3 **c.** 1 and 4 **d.** 1, 2 and 3
Q3.	**The hormone that regulates blood sugar level is**: a)Insulin b)Thyroxine c)Adrenaline d) Estrogen
Q4.	Which one of the following is not a tropic movement? **a)** Movement of shoot towards light **b)** Movement of roots toward water **c)** Movement of roots toward gravity **d)** Drooping of leaves of Mimosa pudica on touching
Q5.	Which plant hormone is responsible for cell elongation? a) Cytokinin b) Auxin c) Gibberellin d) Abscisic acid
Q6.	The growth of tendrils towards a support is an example of: a) Hydrotropism

	b) Phototropism c) Chemotropism d) Thigmotropism
Q7.	Which of the following controls voluntary actions? a) Spinal cord b) Medulla c) Cerebrum d) Cerebellum
Q8.	Which hormone is released during stress and increases blood pressure? a) Thyroxine b) Insulin c) Adrenaline d) Estrogen
Q9	Which of the following statements are correct? (I) Hormones are released directly into the bloodstream. (II) Endocrine glands use electrical impulses. (III) Sex hormones regulate changes associated with puberty. Options: (a) (I) and (II) (b) (I) and (III) (c) (II) and (III) (d) (I), (II) and (III) Ans. (b) (I) and (III)
Q10.	The main function of abscisic acid in plants is to: (a) increase the length of cells (b) promote cell division (c) inhibit growth (d) promote growth of stem
	Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: (A) Both A and R are true and R is the correct explanation of A. (B) Both A and R are true but R is not the correct explanation of A. (C) A is true but R is false. (D) A is false but R is true.
Q11.	**Assertion (A):** Adrenaline increases heart rate and breathing rate during emergency situations. **Reason (R):** Adrenaline helps the body prepare for 'fight or flight' response.
Q12.	**Assertion (A):** Thyroxine helps in regulating metabolism in the human body. **Reason (R):** Iodine is necessary for the synthesis of thyroxine.

	VERY SHORT ANSWER QUESTIONS (VSA)
Q13.	Sameer was studying in his room, suddenly he smells somethings burning and sees smoke in the room. He rushes out of the room immediately. Was sameers's action voluntary or involuntary? Why?
Q14.	(a) Name one gustatory receptor and one olfactory receptor in human beings. (b) Write a and b in the given flow chart of neuron through which information travels as an electrical impulse. Dendrite → a → b → End point of Neuron
Q15.	**(a)Label the parts a) and c) of a neuron in Figure**:-  **(b)** write the function of b) and d).
Q16.	How do we detect the smell of an agarbatti (incense stick)?
Q17	Differentiate between central nervous system and peripheral nervous system.
	SHORT ANSWERS QUESTIONS
Q18.	A patient shows symptoms of high blood sugar. Which gland is likely to be malfunctioning? Explain the hormone involved.
Q19.	In an experiment, a plant kept in a dark room shows bending of shoot towards the window. Explain the reason.
Q20.	A cheetah, on seeing a prey, moves towards him at a very high speed. What causes the movement of his muscles? How does the chemistry of cellular components of muscles change during this event?
Q21.	A person is frightened suddenly. Describe the hormonal changes that occur in his body.

Q22.	Nervous and hormonal system together perform the function of control and coordination in human beings. Justify the statement.
	LONG ANSWERS QUESTIONS
Q23.	Study the figure related to human brain and answer the questions that follow.  a) Name the parts A, B, C and D of human brain. b) What is the function of the fluid filled in the brain? c) What constitutes Peripheral Nervous System (PNS)? d) Name the endocrine gland associated with brain.
Q24.	.(a) Label the parts (a) ,(b) and (c), (d) and show the direction of flow of electrical signals in the given figure  *Fig. 7.2* (b) Write the function of (c) and (d). (c) Explain the process which is taking place in the given diagram.
Q25.	A person while climbing up a rocky hill comes into a panic state and fear.His body starts reacting in a ‘ flight-or-flight’ condition to adjust to the dangerous and stressful situation.Based on the above facts,answer the questions that follow.

	a) (i)Name the hormone secreted in the blood of the person in this condition. OR a) (ii) Name the source gland of the hormone secreted in this condition. b) State any two responses in the body of the person as a result of the secretion of this hormone. c) How does the action of the chemical signals in terms of the hormones differ from the electrical impulses via nerve cells?
	CASE BASED QUESTIONS (CBQs)
Q26.	Rajesh accidentally touched a thorn but quickly withdrew his hand. He later realized that he did this without even thinking about it! So, his reflexes were quite quick.  (a) What is the main centre for such reflex actions of Rajesh? (b) In a neuron, the conversion of electrical signal to a chemical signal occurs at which part? (c) What are electrical impulses? Write any two limitations of electrical impulses.
Q27.	Thyroid gland is a bilobed structure situated in our neck region. It secretes a hormone called thyroxine. Iodine is necessary for the thyroid gland to make thyroxine. Thyroxine regulates carbohydrate, protein and fat metabolism in the body. It promotes growth of body tissues also. When there is an excess of thyroxine in the body, a person suffers from hyperthyroidism and if this gland is underactive it tests that measure the levels of thyroxine and Thyroid Stimulating Hormone (TSH). Hypothyroidism is caused due to the deficiency of iodine in our diet resulting in a disease called goitre.

	 (a) Where is thyroid gland situated in our body? [1] (b) State the function of thyroxine in human body. [1] (c) What is hyperthyroidism? How can we control hypothyroidism? [2] results in hypothyroidism. Hyperthyroidism is diagnosed by blood
	ANSWER
1.	(C)
2.	(C)
3.	(A)
4.	(C)
5.	(D)
6.	(B)
7.	(D)
8.	(C)
9.	(b) (I) and (III)
10.	(c) inhibit growth
11.	(A)
12	(A)
13.	Voluntary because rushing out of the room was under his conscious control.somkessmell's were perceived by the receptors in the sense organ and signals are sent to the brain and then brain sent signals to effector organs i.e. muscles, to move out of the room.
14.	(a) Gustatory receptors are receptors for taste present in taste buds on tongue and olfactory receptors are the receptors for smell present in nasal chambers. (b) a is cyton and b is axon.
15	**i)**a.Dendritec.Axon ii) b is cell body which provide structure to the body and store the organelles of the cell and d is axon terminals transmit messages to other cell.

16.	The smell of an agarbatti is detected by the nose. The olfactory receptors present in the nose sends electrical signal to the fore brain. The fore brain interprets this signal as the smell of the incense stick.
17	

S.No.	CNS	PNS
i	includes brain and spinal cord	includes all nerves that connect CNS to body parts.
ii	Coordinates the body's functions.	Controls involuntary activities of organs.

18.	Pancreas may not be producing enough insulin which helps regulate blood glucose levels by promoting uptake of glucose into cells.
19.	This is positive phototropism. Auxins accumulate on the darker side of shoot, promoting more growth there, causing it to bend towards light.
20.	A cheetah on seeing a prey generates a nerve impulse which reaches the muscles and the muscle fibre moves. The muscle cell will then move by changing their shape so that muscle cells shorten. Muscle cells have special proteins that change both shape and their arrangement in the cell in response to nervous electrical impulses. When this happens new arrangements of these proteins give the muscle cells a shorter form.
21	Adrenal glands release adrenaline → increases heartbeat, respiration, and glucose level to prepare the body for action.
22.	For nervous and hormonal systems to control and coordinate in human beings, hypothalamus plays an important role in receiving the neural/nerve signals from brain and release hormones. E.g. – In situation of iodine deficiency, hypothalamus releases hormones to stimulate pituitary gland, it further sends stimulating hormone to thyroid gland to secrete thyroxin that regulates carbohydrate metabolism.
23	a) A. Cerebrum B. Spinal cord C. medulla oblongata D.Cerebellum b) Cushioning and protecting the brain and spinal cord from injury. c) Cranial nerves, Spinal nerves, Autonomic nervous system d) Pituitary gland: Often called the "master gland," it secretes hormones that regulate other glands, including the thyroid, adrenal glands, and gonads.
24.	a) sensory neuron (b) spinal cord (c)motor neuron (d) effector organ

	b)transfer signals from spinal cord to effector organ and (d) send motor commands from brain to bady c) reflex action
25.	**a) i.** Adrenaline a) ii. adrenal glands b) Increased heart rate: Adrenaline causes the heart to beat faster, delivering more oxygen and glucose to the muscles, preparing the body for quick action. Dilated pupils: The pupils widen (mydriasis) to improve vision and enhance the person's awareness of their surroundings, helping them to detect any potential threats more quickly. c) Hormones are chemical messengers released into the bloodstream and travel throughout the body . Electrical impulses via nerve cells (neurons) are rapid, localized signals that travel along nerve fibers to communicate with other nerve cells, muscles, or glands.ughout the body to affect various organs or tissues.
26.	Ans. (a) The main centre for such reflex actions of Rajesh is spinal cord. (b) At the end of the axon, the electrical impulse sets off the release of some chemicals that cross the gap and start a similar electrical impulse in a dendrite of the next neuron. (c) Electrical impulse is a signal which is transmitted along a nerve fibre. Any environmental change is detected by the specialized tips of nerve cells known as dendrites in the form of a message. The message acquired sets off a chemical reaction which creates an electrical impulse. Electrical impulses have following limitations: (i) They will reach only those cells which are connected by nervous tissue. (ii) Electrical impulses acts for only a short period of time and the message is only sent in the presence of the stimulus. (iii) Nerve cells cannot continuously create and transmit electrical impulses.
27.	Ans. (a) Thyroid gland is situated at the front of the neck, just below the larynx (Adam's apple). (b) Thyroxine hormone is secreted by the thyroid gland. Thyroxine plays vital roles in increasing the basal metabolic rate, regulating long bone growth, increasing body's sensitivity to hormone adrenaline, digestive functions, etc. (c) Hyperthyroidism occurs when the thyroid gland produces excessive amount of hormone thyroxine .We can control hypothyroidism by including iodised salt in our diet. Deficiency of iodine in our diet reduces the levels of TSH and causes a disease called goitre.

CHAPTER-9-LIGHT: REFLECTION AND REFRACTION (VOLUME -1)

	MULTIPLE CHOICE QUESTIONS
1.	Which type of spherical mirror enables a dentist to obtain an enlarged and upright view of a patient's tooth surface? a. Concave mirror b. Convex mirror c. Plane mirror d. None of these
2.	The universally applicable laws of reflection remain valid for: a. Only flat reflecting surfaces b. Only converging mirrors c. Only diverging mirrors d. All types of reflecting surfaces irrespective of shape
3.	The image produced by a perfectly flat reflecting surface always appears: a. Real and upside down b. Virtual and upside down c. Real and upright d. Virtual and upright
4.	A real, inverted image identical in size to the object is formed by a concave mirror when the object is positioned: a. At the principal focus b. At the center of curvature c. Beyond the center of curvature d. Between focus and center of curvature
5.	The mirror that invariably produces a diminished and virtual image, regardless of object placement, is: a. Concave mirror b. Convex mirror c. Plane mirror d. All of these
6.	What is the focal length attributed to an ideal plane mirror? a. Zero b. Infinite c. 25 cm d. 15 cm
7.	For a concave mirror, placing an object between its pole and focus results in an image that is: a. Real, inverted and magnified b. Virtual, upright and magnified c. Real, upright and diminished d. Virtual, inverted and diminished
8.	The center of curvature of a spherical mirror corresponds to: a. A point lying on the mirror surface b. The focal point of the mirror c. The pole of the mirror d. The geometric center of the sphere of which the mirror forms a part
9.	Which category of lens has greater thickness at its center than at its periphery? a. Concave lens b. Convex lens c. Both types d. Neither
10.	An individual suffering from a vision defect that impairs the ability to clearly see nearby objects due to the shortening of the eye's axial length requires which optical lens to realign the image onto the retina? a. Concave lens b. Convex lens c. Cylindrical lens d. None of these

11.	As a light ray propagates obliquely from air into a medium with higher optical density, such as glass, which of the following changes is most accurately observed? a. The speed of light increases b. The speed of light decreases c. The speed remains unchanged d. The light undergoes total internal reflection
12.	What is the correct term for the physical phenomenon in which a light ray changes its direction due to a variation in its velocity while passing obliquely across the interface between two optically dissimilar media? a.. Reflection b. Dispersion c. Refraction d. Diffraction
	VERY SHORT ANSWER QUESTIONS
13.	Define the principal axis of a concave mirror.
14.	State the laws of reflection of light.
15.	What is the focal length of a mirror whose radius of curvature is 24 cm?
16.	Distinguish between real and virtual images.
17.	What is the nature of the image formed by a concave mirror if the object is placed at the center of curvature?
	SHORT ANSWER QUESTIONS
18.	What type of mirror is used in a solar furnace and why?
19.	Define lateral inversion.
20.	What is the relation between the focal length and the radius of curvature of a spherical mirror?
21.	Define the term “refraction of light”.
22.	State Snell’s law of refraction.
	LONG ANSWER QUESTIONS
23.	Explain the laws of reflection of light with suitable ray diagrams and examples.
24.	Describe the nature, position, and size of the image formed by a plane mirror.
25.	State and explain the characteristics of the image formed by a plane mirror.
	CASE-STUDY BASED QUESTIONS
26.	A driver observes that while monitoring traffic behind, the images of vehicles in his rear-view mirror appear significantly smaller than their actual size, yet the field of view is remarkably wide, allowing him to notice vehicles from a broader area. He wonders about the type of mirror that could cause such a distortion while still offering safety on the road. a) Identify the mirror type. b) What image characteristics justify its use? c) Explain why such a mirror is preferred despite size distortion. d) Draw a ray diagram showing field-of-view. e) State the mirror formula.
27.	A student is experimenting with spherical mirrors and successfully projects a distinct image of a candle flame on a screen. The screen is placed 60 cm in front of the mirror, while the candle is positioned 15 cm from the mirror's pole. Intrigued by this setup, the student aims to determine which type of spherical mirror could produce a real image under these conditions a) Which mirror will work? b) Calculate the magnification. c) Describe image nature when object is closer than focal length.

	d) Sketch ray diagram. e) Find object–image separation.		
	ANSWERS		
	MULTIPLE CHOICE QUESTIONS		
	1. (a)	6.(a)	11.(a)
	2. (d)	7.(b)	12.(c)
	3. (d)	8.(d)	
	4. (b)	9.(b)	
	5. (b)	10.(a)	
	VERY SHORT ANSWER QUESTIONS		
	13. The principal axis is the straight line that passes through the pole and the center of curvature of the mirror.		
	14. (i) The angle of incidence is equal to the angle of reflection. (ii) The incident ray, reflected ray, and normal lie in the same plane.		
	15. 12 cm		
	16. Real Image: Formed when reflected/refracted rays actually meet; can be obtained on a screen. Virtual Image: Formed when rays appear to meet; cannot be obtained on a screen.		
	17. Real, inverted, and same size as the object		
	SHORT ANSWER QUESTIONS		
	18. Concave mirror, because it focuses sunlight to a point to produce high temperature		
	19. Lateral inversion is the reversal of left and right sides in the mirror image.		
	20. f=R/2 = 24/2 = 12cm		
	21. Refraction is the bending of light when it passes from one medium to another.		
	22. The ratio of the sine of the angle of incidence and the sine of the angle of refraction is always a constant for a pair of media.		
	$n = \frac{\sin i}{\sin r}$		
	LONG ANSWER QUESTIONS		
	23. Laws of Reflection: - Incident ray, reflected ray, and normal lie in the same plane. - Angle of incidence = Angle of reflection. Example: A ray falling on a plane mirror reflects at the same angle. Diagram: Show incident ray, reflected ray, and normal.		
	24. Image by Plane Mirror: - Nature: Virtual and erect - Position: Behind the mirror at same distance - Size: Equal to the object		
	25. Characteristics of Plane Mirror Image: - Virtual, erect, laterally inverted, same size, and same distance behind the mirror.		
	CASE-STUDY BASED QUESTIONS		
	Q26.		
	a) Convex mirror. b) Forms virtual, erect, diminished images. c) Wide field of view enhances safety. d) Ray diagram: Convex mirror reflecting diverging rays appearing from focal point. e) 1/f = 1/v + 1/u		
	Q27.		
	a) Concave mirror. b) m = v/u = -60/-15 = 4. c) Virtual, erect, magnified image forms. d) Ray diagram: Object between focus and pole. e) Image-object separation = 45 cm.		

CHAPTER-10-THE HUMAN EYE AND THE COLOURFUL WORLD

VOLUME - 1

General Instructions:

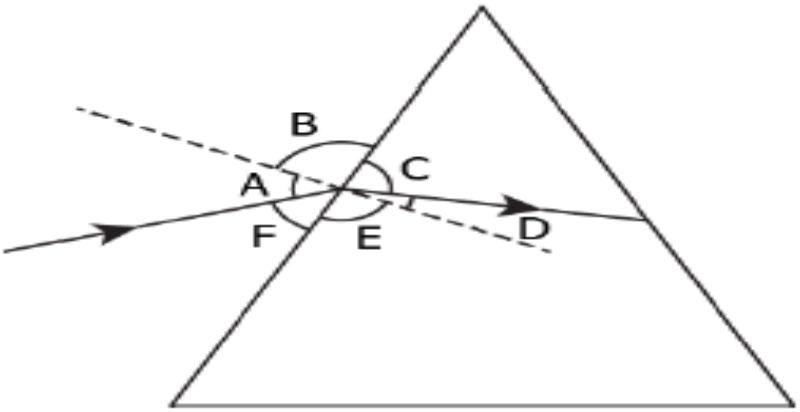
1. All questions would be compulsory
2. Section A would have12 simple/complex MCQs and 02 Assertion-Reasoning type questions carrying 1 mark each.
3. Section B would have 5 Very Short Answer (VSA) type questions carrying 02 marks each.
4. Section C would have 5 Short Answer (SA) type questions carrying 03 marks each.
5. Section D would have 3 Long Answer (LA) type questions carrying 05 marks each.
6. Section E would have 2 source based/case based/passage based/integrated units of assessment (04marks each) with sub-parts.

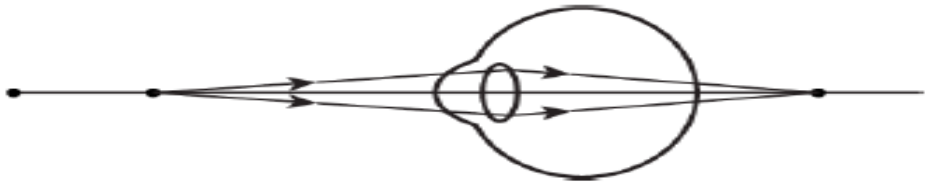
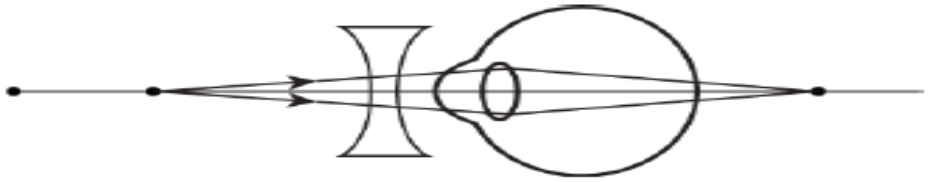
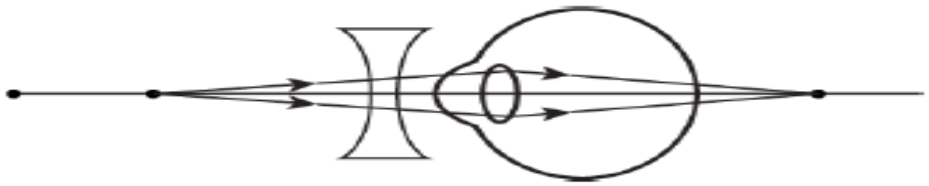
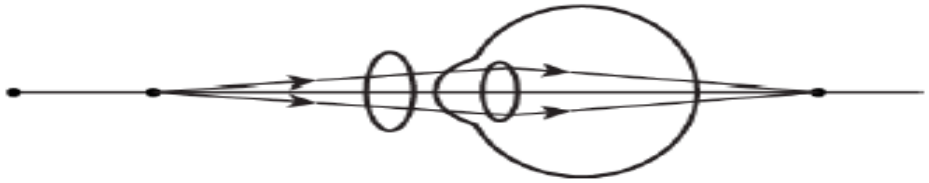
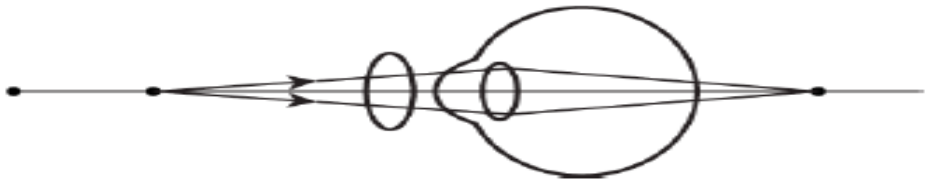
Section-A

Question 1 to12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions

1	A person can clearly see objects only when they are between 50 cm and 200 cm from his eye. What kind of lenses will he need to see objects at infinity clearly? A. Convex lens of suitable focal length B. Concave lens of suitable focal length C. Bifocal lens D. Cylindrical lens ANS- B. Concave lens of suitable focal length	1
2	If the focal length of the eye lens increases, the eye will be unable to see: A. Distant objects B. Nearby objects C. Both near and distant objects D. Objects at infinity ANS- B. Nearby objects	1
3	A ray of white light enters a glass prism. Which of the following is true? A. Red light bends the most B. Violet light bends the least C. Red light bends the least D. All colors bend equally	1

	ANS- C. Red light bends the least	
4	A student sitting on the last bench can read the letters written on the blackboard but is not able to read the letters written in his textbook. Which of the following statements is correct? A. The near point of his eyes has receded away B. The near point of his eyes has come closer to him C. The far point of his eyes has come closer to him D. The far point of his eyes has receded away ANS- A. The near point of his eyes has receded away	1
5	A person cannot see distinctly objects kept beyond 2 m. This defect can be corrected by using a lens of power A. + 0.5 D B. – 0.5 D C. + 0.2 D D. – 0.2 D ANS- B. –0.5 D	1

6	When we enter a dark room coming from outside, immediately the things inside the room do not appear clear to our eyes. This is because A. Pupils do not open at all in the dark B. Pupils take time to adjust. C. Light travels slower in a dark room. D. Pupils open very quickly in the dark. ANS- B. Pupils take time to adjust	1
7	The image shows a light ray incident on a glass prism. The various angles are labelled in the image. Which angle shows the angle of incidence and angle of refraction, respectively?  A. A and D B. B and E C. C and F D. D and F ANS: Option A	1

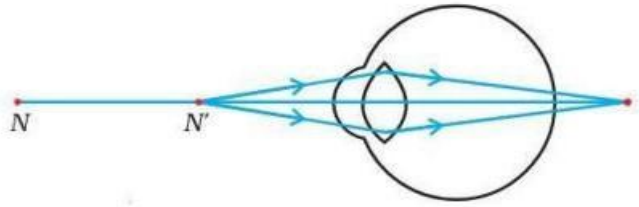
8	The image shows the ray diagram of a defective eye.  **Which option shows the correction of the defect of the eye?** **(a)**  **(b)**  **(c)**  **(d)**  ANS: Option D	1
9	When we enter a dark room coming from outside, immediately the things inside the room do not appear clear to our eyes. This is because A. Pupils do not open at all in the dark B. Pupils take time to adjust. C. Light travels slower in a dark room. D. Pupils open very quickly in the dark. ANS: B. Pupils take time to adjust.	1
10	Twinkling of stars is due to atmospheric A. Dispersion of starlight by water droplets of the atmosphere B. Refraction of starlight by different layers of varying refractive indices C. Scattering of light by dust particles of the atmosphere D. Reflection of starlight by different layers of varying refractive indices ANS: B. Refraction of starlight by different layers of varying refractive indices	1

Question No. 11 to12 consist of two statements– Assertion (A)and Reason (R).Answer these questions by selecting the appropriate option given below: A. Both A and R are true, and R is the correct explanation of A. B. Both A and R are true, and R is not the correct explanation of A. C. A is true but R is false. D. A is false but R is true		
11	Assertion (A): The human eye forms a real image on the retina. Reason (R): The crystalline lens of the eye acts as a converging lens. ANS- (a) Both Assertion and Reason are correct and Reason is correct explanation.	1
12	Assertion (A): Concave lens is used to correct myopia or short sightedness. Reason (R): A concave lens of suitable focal length diverges the parallel rays from the distant objects as if they are coming from the far point of the myopic eye. This helps the eye lens to form a clear image at the retina ANS- (a) Both Assertion and Reason are correct and Reason is correct explanation.	1
	Section-B **Question No. 13 to 17 are very short answer questions**	
13	An eye specialist prescribes lenses of power +2 D to a person. What is the nature and focal length of the lens? How does it help the person? ANS- Convex lens, focal length = 100 / 2 = 50 cm = 0.5 m. It helps focus light on retina for farsightedness (hypermetropia).	2
14	During a solar eclipse, an observer notices a ring of light around the Moon. Which optical phenomenon is responsible for this? Explain its working in the atmosphere. ANS- Atmospheric refraction + diffraction (ring of light = annular eclipse effect).	2
15	How will the rainbow appear if the observer is in a plane flying above the rain-bearing clouds? ANS- Observer may see a complete circular rainbow.	2
16	A person is suffering from both myopia and hypermetropia. Explain how this is possible and what type of lens would be required to correct this defect. ANS- This is possible in the case of presbyopia, where the lens loses its flexibility and ability to focus on both near and far objects. A bifocal lens would be required to correct this defect.	2
17	Explain how the human eye adjusts to changes in light intensity. What is the role of the iris and pupil in this process? ANS- The human eye adjusts to changes in light intensity through the iris and pupil. The iris controls the amount of light entering the eye by adjusting the size of the pupil.	2
	Section-C **Question No. 18 to 22 are short answer questions**	

18	Describe the formation of a rainbow in the sky. What role does refraction, reflection, and dispersion play in its formation? ANS- Sunlight → refraction (entry) → reflection (inside raindrop) → refraction + dispersion (exit).	3
19	Rahul observes that during foggy mornings, car headlights appear to be scattered and less effective. Explain scientifically why this happens. What change in the type of headlight can improve visibility? ANS- Tiny water droplets scatter light → beam spreads → reduced visibility. Solution: use yellow light, fog lights with focused beams.	3
20	A student complains of blurred vision while reading a book but can see distant objects clearly. Name the defect and draw a diagram showing how this defect can be corrected using an appropriate lens. ANS- Hypermetropia; corrected with convex lens (diagram: convex lens converging rays onto retina).	3
21	A person is working on a computer for an extended period. What are the potential risks to their eye health, and how can they mitigate these risks? ANS- Potential risks include eye strain, dry eyes, and blue light exposure. Mitigation strategies include following the 20-20-20 rule, adjusting display settings, and taking regular breaks.	3
22	Explain how the human eye adapts to changes in light intensity. What are the limitations of this adaptation, and how can we protect our eyes in extreme lighting conditions? ANS- The human eye adapts to changes in light intensity through the iris and pupil. However, there are limitations to this adaptation, and prolonged exposure to extreme lighting conditions can cause eye damage. Protection measures include wearing sunglasses or protective eyewear.	3

Section-D

Question No. 23 to 25 are long answer questions.

23	 Observe the diagram and answer the following questions: (a) Name the defect of vision shown in figure. What will be the optical experience of the person suffering from this defect? (b) Give two possible reasons for this defect of eye in human beings (c) Draw a labeled diagram to show how the defect is rectified by using suitable lens.	5
24	A) Light of wavelength 600 nm is refracted by a prism of glass having refractive index 1.5. Calculate the speed of this light in glass (Speed of light in vacuum = 3×10^8 m/s). What does this tell you about dispersion? ANS- $v = c / n = 3\times10^8 / 1.5 = 2\times10^8$ m/s. Shows light slows → dispersion. B) In a science fair, a student shows a setup where white light passes through two identical prisms placed upside down with respect to each other. Explain the outcome of this arrangement. What concept does it demonstrate? ANS- Spectrum from 1st prism recombined by 2nd → white light. Concept: recombination of spectrum.	5
25	A) If the Earth had no atmosphere, what would be the color of the sky and the appearance of the Sun at sunrise? ANS- Sky: black. Sun: white at sunrise. B) Describe the phenomenon of scattering of light and its effect on the color of the sky. How does the scattering of light change during sunrise and sunset? ANS- Scattering of light is the phenomenon where shorter wavelengths of light are scattered more than longer wavelengths. This is why the sky appears blue during the day. During sunrise and sunset, the light travels through more atmosphere, scattering shorter wavelengths and making the sky appear red.	5

Section–E

Question No. 26 to 27 are case-based/data-based questions.

26	In an experiment, Paheli used an equilateral triangular glass prism and projected a narrow beam of white light source from one side of the surface of the prism. She placed a screen on the other side and saw many colours appearing as patches on the screen. But when she used a red light source, she could only see a red patch on the screen. Similarly she used a blue and green light source and could only see one colour patch on both occasions. (i) What explanation can Paheli give to her friends to explain this phenomenon? (ii) Why she could not see any other colour when the red light was used? (iii) What is the measurement of angle of prism in an equilateral triangle? (iv) Arrange the following component of white light in increasing order of wavelength. Blue ,Red ,Green ,Violet ANS- i) White light disperses → spectrum; single color light → no dispersion. ii) Monochromatic light → no dispersion. iii) 60° iv) Violet < Blue < Green < Red	4
27	Whether the color of the ocean and the color of the sky are related? Is this the same reason? But they occur independently of each other. In both the cases, the preferential absorption of long wave length light gives rise to blue. The Ocean looks blue, the blue wave length returned predominantly than longer wave length. Note that this effect only works if the water is very pure. A. Which phenomenon of light is the reason for blue color of sky? B. The intensity of scattered light will be more in _____ (shorter / longer) wavelength C. Say Yes or No for the following: (i) Red color of sun during sunset is due to scattering (ii) Twinkling of stars is due to scattering of light ANS- A) Rayleigh scattering B) Shorter wavelength C) i) Yes ii) No (due to refraction) **********	4

CHAPTER-11- ELECTRICITY

VOLUME- 1

Section A: Multiple Choice Questions (1 Mark Each)

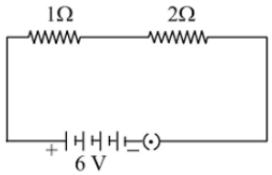
1	**Which device is used to measure electric current in a circuit?** a) Voltmeter b) Ammeter c) Galvanometer d) Thermometer **ANS:b) Ammeter**
2	**In which arrangement do resistors give minimum resistance?** a) Series b) Parallel c) Both a and b d) None **ANS:b) Parallel**
3	**What is the SI unit of electric charge?** a) Volt b) Ampere c) Coulomb d) Ohm **ANS:c) Coulomb**
4	**Which of the following represents Ohm's Law?** a) V = IR b) P = VI c) I = Rt d) Q = It **ANS:a) V = IR**
5	**Which material is used in the filament of electric bulbs?** a) Copper b) Aluminium c) Tungsten d) Nichrome **ANS:c) Tungsten**
6	**A wire has resistance R. If it is stretched to double its length, cross sectional area reduced to half .What will be the new resistance?** a) R/2 b) 2R c) 4R d) R **ANS:c) 4R**
7	**Fuse is always connected in –** a) Parallel b) Series c) Diagonal d) None **ANS:b) Series**
8	**Electric power is equal to –** a) I/R b) IR^2 c) V × I d) V/I **ANS:c) V × I**

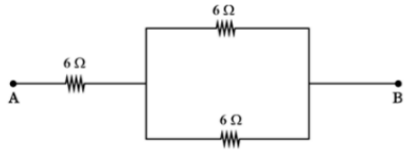
9	**A current of 1 A flows through a wire for 10 seconds. How much charge flows?** a) 10 C b) 5 C c) 1 C d) 100 C **ANS: a)10 C**
10	**Which device works on heating effect of current?** **a) Fan** **b) Bulb** **c) Battery** **d) Switch** **ANS:**b) Bulb
11	**Assertion:** In a parallel circuit, total resistance decreases. **Reason:** Current divides through each resistor. Correct option: a) Both A and R are true, and R is the correct explanation
12	**Assertion:** Copper is used for household wiring. **Reason:** It has low resistivity and is a good conductor. Correct option: a) Both A and R are true, and R is the correct explanation.

Section B: Short answer Questions (2 Marks Each)

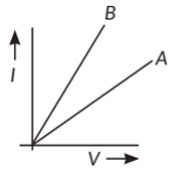
13	**Why is tungsten used in electric bulbs?** High melting point and glows without melting
14	**Define 1 volt. Write relation between work and charge.** 1V = 1J/1C; V = W/Q
15	**State two factors affecting resistance of a conductor.** Length and cross-sectional area
16	**Why is parallel connection preferred in household circuits?** Same voltage across devices and independent operation
17	**State two disadvantages of series circuits.** One device failure stops entire circuit; voltage divides.

Section D: Short answer Questions (3 Marks Each)

18	**In the given circuit calculate the(i) equivalent resistance ii) current iii) power consumed in watts in the resistor of 2Ω :**  **ANS:.** Equivalent resistance = $R_1 + R_2 = 1\ \Omega + 2\ \Omega = 3\ \Omega$ I = V / R = 6 V / (1 Ω + 2 Ω) = 6 V / 3 Ω = 2 A Electric power, $P = I^2 \times R$ $= (2\ A)^2 \times 2\ \Omega$ = 4 × 2 W = 8 W

19	**A bulb is rated 60W, 220V. Calculate: (a) Current (b) Resistance** I = P/V = 60/220 ≈ 0.27 A R = V/I = 220/0.27 ≈ 814.8 Ω
20	**How is the resistivity of alloys compared with those of pure metals from which they may have been formed? OR** **If the conductor A is made of copper and the conductor C is made of constantan (alloy of copper and nickel), then which one of the two will have more electrical resistance and why?** **ANS:.** Resistivity of alloys is generally higher than its constituent metals. Therefore, alloy has more resistance
21	**Show how you would connect three resistors each of resistance 6 Ω, so that the combination has a resistance of 9 Ω. Also justify your ANS:wer** **ANS:** 
22	**State Joule's Law of heating and give two uses.** **ANS:.** $H = I^2Rt$ Uses: Electric heater, iron

Section E: Long answer Questions (5 Marks Each)

23	**How is electric current related to the potential difference across the terminals of a conductor? (ii) Why should an ammeter have low resistance? (iii) Two V-I graphs A and B for series and parallel combinations of two resistors are as shown. Giving reason state which graph shows (a) series, (b) parallel combination of the resistors**  **ANS:** **(**I)V=IR (ii) To measure the entire current passing through the circuit, the ammeter should have low resistance. (iii) $R_s = R_1 + R_2$ = Maximum resistance $R_p = (R_1 \times R_2) / (R_1 + R_2)$ = Minimum resistance So, RA > RB
24	**What is a fuse? Why is it necessary? Write 2 precautions & 1 use.** **ANS:** Fuse protects from overload by melting Use correct rating, switch off supply before changing Use: In home main circuits
25	**A fuse wire melts at 5 A. If it is desired that the fuse wire of same material melt at 10 A, then whether the new fuse wire should be of smaller or larger radius than the earlier one? Give reasons for your ANS:wer** **ANS:**

	Let the resistance of the wire be R, heat produced in the fuse at 5 A in 1s is $H = (5)^2R$ ($H = 25R$) So, fuse melts at $(5)^2R$ joules of heat. Let, the resistance of new wire is R' So, heat produced in 1 second = $(10)^2R' = 100R'$ $25R=100R'$ or $R'=R/4$; $R\alpha\ 1/A$ To prevent it from melting .. cross-sectional area of new fuse wire is four times the first fuse. Now, $A = \pi r^2$, so new radius is twice the previous one. So, at 10A, the new fuse wire of same material and length has larger radius than the earlier one.

Section E: Case based study (4 Marks Each)

26	Riya is studying household circuits. She observed that when multiple appliances like fANS:, lights, and TV are used in her house, all of them work independently and receive equal brightness or speed. Her teacher explained to her that this is because of the way the appliances are connected in the circuit. She also noticed that even if one bulb fuses, the rest continue to work. 1) Which bulb glows brighter? 100W 2) Why are bulbs connected in parallel? To get full voltage and work independentl 3) What is the Voltage across each bulb? Will both work if one fails? 220V Yes, because connected in parallel
27	Raj wanted to test how much electricity his iron box consumes. He checked the label which read '220V, 1000W'. He connected it to a power supply and measured the current using an ammeter. His father explained to him the importance of using a fuse in the circuit for safety. A few days later, the fuse blew out when another heavy appliance was turned on. This made Raj curious about how the heating effect of current works. 1) What is the Power consumed? $P = V \times I = 220 \times 5 = 1100$ W 2) What is the Function of fuse? Breaks circuit when current exceeds limit 3) What if higher-rated fuse used? Which effect of current is used? Won't melt → appliance damage/fire risk Heating effect

CHAPTER-13- OUR ENVIRONMENT
VOLUME-1

Section-A

Questions 1 to 12 are multiple choice questions.

1. What is the ultimate source of energy which further flows through the food chain?

   (a) chemical energy (b) wind energy (c) Electric energy (d) solar energy

   Ans-(d) solar energy

2. The flow of energy in an ecosystem is always:

   (a) unidirectional (b) bidirectional (c) cyclic (d) multidirectional

   Ans-(a) unidirectional

3. Kitchen waste can be hygienically disposed of through

   (a) Dumping (b) Composting (c) Incineration (d) Recycling

   Ans-(b) Composting

4. Which group of organisms are not constituents of same food chain?

   (a) Grass, lion, rabbit, wolf (b) Plankton, man, fish

   (c) Wolf, grass, snake, tiger (d) Frog, snake, eagle, grass, grasshopper

   Ans-(b) Plankton, man, fish

5. The percentage of solar radiation absorbed by all the green plants for the process of photosynthesis is about:

   (a)1% (b)2% (c)3% (d)4%

   Ans-(a) 1%

6. Select the mismatched pair in the following and correct it.

   (a)Bio-magnification — Accumulation of chemicals at the successive trophic levels of a food chain
   (b)Ecosystem — Biotic components of environment
   (c)Aquarium — A man-made ecosystem
   (d)Parasites — Organisms which obtain food from another living organism

   Ans- (b)Ecosystem - Biotic components of environment

7. Which one of the following green house gases is a contributor of global warming due to the incomplete combustion of coal and petroleum?

   (a)Oxides of nitrogen (b)Methane (c) Carbon monoxide (d) Carbon dioxide

   Ans- Carbon monoxide

8. Depletion of ozone is mainly due to _____.

   (a)chlorofluorocarbon compounds (b) carbon monoxide (c) methane (d) Sulphur dioxide

   Ans-(a)chlorofluorocarbon compound

9.	What is the role of decomposers in the ecosystem? (a) Photosynthesis (b) Consume producers (c) Recycle nutrients (d) Respiration Ans-(c) Recycle nutrients
10.	One major reason to avoid plastic use is: (a) It's expensive (b) It decomposes fast (c) It pollutes soil and water (d) It melts in sunlight Ans-(c) It pollutes soil and water
	ASSERTION REASON TYPE QUESTIONS *Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:* *(a) Both A and R are true and R is the correct explanation of A.* *(b) Both A and R are true but R is not the correct explanation of A.* *(c) A is true but R is false.* *(d) A is false but R is true.*
11.	**Assertion**: Aquarium needs regular cleaning **Reason**: There are no microbes to clean water in aquarium, therefore, it needs to be regularly cleaned. Ans-**(a)** Both **A** and **R** are true, and **R** is the correct explanation of **A**.
12	**Assertion:** Food chain is responsible for the entry of harmfulchemicals in our bodies. **Reason**: The length and complexity of food chains vary greatly. Ans**(b)** Both **A** and **R** are true, and **R** is not the correct explanation of **A**.
	VERY SHORT QUESTIONS
13.	Define the term 'biodegradable waste'. Select biodegradable waste(s) from the following: Insecticides, agricultural waste, plastics, sewage Ans- **Biodegradable waste:** Biodegradable waste refers to substances that can be **broken down naturally** by microorganisms like bacteria and fungi into **simpler, harmless substances**. **Biodegradable waste(s) from the given list:** • **Agricultural waste** • **Sewage**
14.	*Why is energy flow in a food chain unidirectional?* **Ans:** Energy flows from the **sun to producers**, and then to **consumers** in one direction. It cannot be reused by the previous level as some energy is **lost as heat** at each trophic level..

15	*Name two components of the biotic environment.* **Ans:** Plants and animals.
16.	**Name one biodegradable and one non-biodegradable waste.** **Ans:** Biodegradable – fruit peel; Non-biodegradable – plastic.
17.	**What do you mean by 10% law of energy transfer?** **Ans:** Only 10% of energy is transferred from one trophic level to the next.
	SHORT ANSWER TYPE QUESTIONS
18.	*What is biological magnification? Explain with the help of an example.* **Ans:** Biological magnification refers to the **increase in the concentration of harmful substances like pesticides** at each successive trophic level in a food chain. Example: DDT sprayed on crops enters the food chain and accumulates in top carnivores like birds.
19	Why are bacteria and fungi called decomposers? List any two advantages of decomposers to the environment? Ans-Bacteria and fungi are called **decomposers** because they **break down the complex organic matter** of dead plants and animals into **simpler substances**. **Two advantages of decomposers:** 1. They **recycle nutrients** back into the soil, making them available for plants. 2. They help in **cleaning the environment** by decomposing dead and decaying matter.
20.	Why is excessive use of CFCs a cause of concern? Ans-CFCs (Chlorofluorocarbons) **deplete the ozone layer** in the upper atmosphere. The ozone layer protects us from **harmful ultraviolet (UV) radiation**. Excessive use of CFCs leads to **ozone holes**, which can cause **skin cancer, eye damage**, and **harm to crops and marine life**.
21.	*List two advantages of using paper or cloth bags instead of plastic bags.* **Ans:** • Paper and cloth bags are **biodegradable** and do not cause pollution. • They are **recyclable and reusable**, reducing environmental harm.
22.	*What are the problems caused by the excessive use of non-biodegradable substances?* **Ans:** • They **pollute soil and water**. • They may **enter food chains**, leading to **health hazards**. • They remain in the environment for long periods, causing **land and air pollution**.
	LONG ANSWER TYPE QUESTIONS
23.	**Explain how human activities are disturbing the balance of the environment. Suggest any three sustainable practices to reduce this impact.**

	Ans- ● Activities like **deforestation, pollution, excessive plastic use, and industrial waste** disturb nature. ● These lead to **global warming, loss of biodiversity**, and **pollution**. **Sustainable practices:** 1. **Use cloth/paper bags instead of plastic** 2. **Segregate waste and compost biodegradable waste** 3. **Plant more trees and use clean energy (solar, wind)**
24.	**What is ozone? How is it formed in the atmosphere? Why is it called a protective shield? What are the effects of ozone depletion?** **Ans-** ● **Ozone (O_3)** is a molecule made of three oxygen atoms. ● It forms when **UV rays split O_2** molecules; the free oxygen atom combines with another O_2 to form O_3. ● It acts as a **protective shield** by absorbing **harmful UV radiation**. ● **Depletion effects:** Skin cancer, cataracts, reduced crop yield, harm to aquatic life.
25	**"Energy flow in an ecosystem is always unidirectional." Justify this statement. Explain how pesticides enter the food chain and accumulate in our bodies.** **Ans-** ● Energy flows from **sun → producers → consumers** and is **lost as heat** at each level. It **cannot return** to the previous level—so it's unidirectional. ● **Pesticides** used on crops are consumed by herbivores, then by carnivores. These **non-biodegradable chemicals accumulate** at higher trophic levels—a process called **biological magnification**. ● Humans, being at the top, are at **maximum risk**.
	CASE BASED QUESTIONS

26.	**Food Chain in a Forest** A forest ecosystem contains producers like grasses and trees, primary consumers like deer and insects, and secondary consumers like tigers and snakes. Decomposers such as fungi and bacteria break down dead organic matter. a) Which of the following correctly represents a food chain in the forest ecosystem? A. Grass → Deer → Tiger B. Tiger → Deer → Grass C. Fungi → Grass → Deer D. Deer → Grass → Tiger b) In the forest food chain, who are the primary consumers? A. Tigers B. Deer C. Fungi D. Trees c) What role do decomposers play in this ecosystem? **OR** Construct a food chain with four trophic levels.
27.	The atmosphere is a blanket of air and a precious natural resource for sustaining life on the Earth. Unfortunately, human activities based on national/personal interests are causing harm to this common resource, notably by depleting the fragile ozone layer, which acts as a protective shield for life on the Earth. Ozone molecules consist of three oxygen atoms; Ozone molecules are exceeding rare: fewer than ten in every million molecules of air. However, for nearly a billion years, their presence in the atmosphere has played a vital role in safeguarding life on Earth. **Now answer the following questions-** (i)Which chemicals are primarily responsible for ozone layer depletion? (ii)How does ozone layer depletion affect marine ecosystems? (iii)How can individuals contribute to protect the ozone layer? **OR** How ozone is formed in the atmosphere? Show with reaction.

CHAPTER 01-CHEMICAL REACTIONS AND EQUATIONS

WORKSHEET-(VOLUME-1)

TIME:20min MM:20M

Multiple choice questions (1*5=5)

1. What is formed at the cathode during the electrolysis of water?

A) Oxygen
B) Hydrogen
C) Water
D) Hydroxide ions

2. In a double displacement reaction, the exchange of which of the following takes place?

A) Atoms
B) Ions
C) Electrons
D) Molecules

3. What type of reaction is: $AgNO_3 + NaCl \rightarrow AgCl\downarrow + NaNO_3$

A) Decomposition
B) Combination
C) Displacement
D) Double displacement

Following questions 4 have two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

4. Assertion (A): Magnesium ribbon burns with a dazzling white flame in air. Reason (R): Magnesium reacts with oxygen to form magnesium oxide.

5. Balance following equation.: H2O H2+02

VERY SHORT ANSWER QUESTIONS (2*2=4)

6. In the reaction:

$MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

Identify the oxidising agent and reducing agent.

7. Define the term 'rancidity'. How can it be prevented?

SHORT ANSWER QUESTIONS (3M*2=6M)

8. Write a balanced chemical equation for each of the following and mention the type of reaction:

(a) Iron reacts with steam

(b) Decomposition of lead nitrate

(c) Reaction of sodium with water

---

9. When silver chloride is exposed to sunlight, it turns grey. Identify the type of reaction, write a balanced chemical equation for the reaction and give one use of this reaction.

Long answers type questions (1*5=5M)

10. Ravi observed that when iron nails are dipped in copper sulfate solution, a brown layer gets deposited on the nails, and the blue color of the solution fades.

Questions:

a) What type of chemical reaction is occurring here?

---

b) Write the balanced chemical equation for this reaction.

---

c) Why does the color of the solution change?

---

d) Name the element that is more reactive in this reaction.

---

e) Identify the oxidizing and reducing agents.

ANSWER KEY OF WORKSHEET 2

Q1. B) Hydrogen

Q2. B) Ions

Q3. D) Double displacement

Q4.a) Both A and R are true and R is the correct explanation of A

Q5. 2 H20 □2 H2+02

Q6 ● Oxidizing agent: MnO_2 ● Reducing agent: HCl (Cl^-)

Q7. Definition: Oxidation of fats and oils when exposed to air, making food smell and taste bad

● Prevention:

- ○ Store in airtight containers
- ○ Use antioxidants
- ○ Refrigerate
- ○ Pack food in nitrogen

Q8. (a) Iron reacts with steam
Equation: $3Fe + 4H_2O$ (steam) → $Fe_3O_4 + 4H_2$
Type: Combination + Displacement reaction
(b) Decomposition of lead nitrate Equation: $2Pb(NO_3)_2$ →
$2PbO + 4NO_2 +$
O_2 Type: Thermal decomposition reaction

(c) Reaction of sodium with water
Equation: $2Na + 2H_2O \rightarrow 2NaOH + H_2$ Type:
Exothermic, displacement

reaction

Q9.● Type of reaction: Photochemical decomposition

● Equation: $2AgCl \rightarrow 2Ag + Cl_2$ (in presence of sunlight) ●
Use: Photography (black-and-white films)

Q10.a) Type of reaction: Displacement reaction

b) Balanced equation: $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$
c) Color change reason: Iron displaces copper, forming $FeSO_4$ (greenish), and copper
gets deposited as a brown coating

d) More reactive element: Iron
e) Oxidizing agent: Cu^{2+} (from $CuSO_4$), Reducing agent: Fe

CHAPTER 02- ACIDS, BASES AND SALTS

WORKSHEET (VOLUME-1)

TIME:20MIN MM=16

Very short answers type questions (2*3=6)

Q.1 Write the name of acids present in tomato, tamarind, curd, lemon

……
……

Q.2. Why does dry HCl gas not change the color of dry litmus paper?

……
……

Q 3. A milkman adds a small amount of baking soda to fresh milk. Why does this milk take a long time to set as curd?

……
……

Short answers type questions (3*2=6)

Q.6. A student dropped a few pieces of marble in dilute hydrochloric acid in a test tube.

He observed brisk effervescence. a)
Name the gas evolved.

……

b) How will you test the gas?
……

c) Write a balanced chemical equation for the reaction.
……

Q.7. A white powder is used by doctors for supporting fractured bones.

a) Identify the substance.
……

b) Write the chemical name and formula.
……
……

c) How is it prepared from gypsum? Give the equation.

……
……

Long answers type questions (1*4=4)

Q.8. Case Study Question: Antacids and Neutralization Read the passage carefully and answer the following questions:

Our stomach produces hydrochloric acid which helps in digestion. Sometimes, excess acid is produced which causes indigestion. To get relief, people use antacids – mild bases like magnesium hydroxide. Antacids neutralize excess acid in the stomach. Similarly, farmers use quick lime or slaked lime to neutralize acidic soil. Also, factory waste is often acidic and needs to be neutralized before disposal.

a) What is the chemical name and formula of an antacid commonly used?

……
……

b) Write the word equation for the reaction between hydrochloric acid and magnesium hydroxide.

……
……

c) How does the use of lime help in treating acidic soil?

……
……

d) Why is it important to neutralize factory waste before disposal?

……
……

OR,

e) Which type of chemical reaction takes place when an acid reacts with a base?

……
……

ANSWER KEY OF WORKSHEET 2

1. Tomato-oxalic acid,tamarind-tartric acid,curd-lactic acid,lemon-ascorbic acid

2. Dry HCl does not ionize and release H^+ ions in the absence of water. Litmus shows a color change only in the presence of ions, so there is no effect on dry litmus paper.

3. Baking soda is a base that neutralizes the acid produced by bacteria. As a result, the pH remains high and the milk takes longer to curdle.

4.

A) Carbon dioxide (CO_2)
B) Pass the gas through lime water. It will turn milky.
C) Balanced equation:
$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2\uparrow$

5.

A) Plaster of Paris
B) Calcium sulphate hemihydrate ($CaSO_4 \cdot ½H_2O$)
C) Preparation from gypsum:
$CaSO_4 \cdot 2H_2O$ (Gypsum) $\rightarrow CaSO_4 \cdot ½H_2O + 1½H_2O$ (on heating)

6.

a) Magnesium hydroxide, $Mg(OH)_2$
b) Hydrochloric acid + Magnesium hydroxide → Magnesium chloride + Water
c) Lime helps neutralize acidic soil by reacting with acids and increasing the pH, making it suitable for crops.
d) Neutralizing factory waste prevents harm to aquatic life and protects the environment from acid pollution.
e) Type of reaction: Neutralisation reaction

CHAPTER 03-METALS AND NON METALS
WORKSHEET-VOLUME-1

TIME:20MIN **MM=16**

Very short answer answer type questions (2*3=6) Q1.Which element is most abundant metal in earth crust?

……
……

Q2. Why the item made of silver turn black when exposed to air?

……
……

Q3. Give reasons:

(a) Platinum, gold and silver are used to make jewellery.

……
……

(b) Sodium, potassium are stored under oil.

……
……

Short Answer Answer Type Questions (3*2=6)

Q. 4What is meant by corrosion? Name any two methods used for the prevention of corrosion.

……
……

……
……

……
……

Q. 5 State reasons for the following:

(a) Electric wires are covered with rubber like material.

……
……

(b) From dilute hydrochloric acid, zinc can liberate hydrogen gas but copper cannot.

……
……

(c) Sulphide ore of a metal is first converted to its oxide to extract the metal from it.

……
……

Long answer type question (1*4=4)

Q.6 A metal 'X' combines with a non-metal 'Y' by the transfer of electrons to form a compound Z.

(i) Write metal and non metal element.

……
……

(ii) State the type of bond in compound Z.

……
……

(iii) What can you say about the melting point and boiling point of compound Z?

……
……

(iv) Will this compound dissolve in kerosene or petrol?

……
……

(v) Will this compound be a good conductor of electricity?

……
……

ANSWER KEY OF WORKSHEET 2

1. .Aluminium

2. . The items made up of silver turn black this is because it reacts with hydrogen sulphide gas in the air to form coating silver sulphide.

3. .(a) Platinum, gold and silver are used to make jewellery because these are malleable and ductile. These are highly resistant to corrosion.
(b) Sodium, potassium are very reactive and catch fire when exposed to air. This is due to their low ignition temperature and high reactivity.

4. Corrosion is a process in which metal reacts with substances present in the environment to form surface compounds.
Prevention: (i) Galvanization is a process to prevent corrosion of iron.
(ii)Electroplating is also used to prevent corrosion.

5. : (a) It is because rubber is an insulator and does not allow current to flow through it.
(b) Zinc is more reactive than hydrogen. Therefore, it can displace hydrogen from dilute HCl whereas copper cannot, because, it is less reactive than hydrogen.
(c) It is because it is easier to reduce oxide ore as compared to sulphide ore
6. .(i)X being a metal loses electrons and Y being a non-metal gains electrons to form Z.

(ii) The chemical bond formed by the transfer of electrons from one atom to another is Known as an ionic bond. Hence, Z is an ionic compound.

(iii) Compound Z is an ionic compound thus, it has high melting and boiling points.

(iv) Ionic compounds are insoluble in non-polar solvents such as kerosene or petrol.

(v) As Z is an ionic compound, it does not conduct electricity in the solid state because movement of ions in the solid is not possible due to their rigid structure. But it conducts electricity in the molten state or in aqueous solution due to the movement of ions freely.

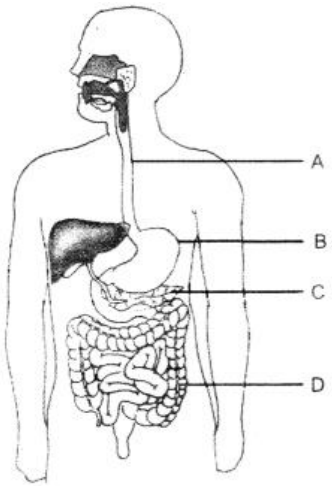
CHAPTER-5-LIFE PROCESSES

WORKSHEET -(VOL-1)

Time: 30 minutes Max. Marks : 25

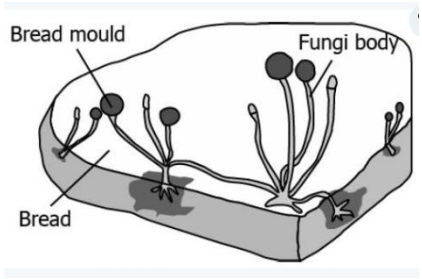
Multiple Choice Questions (1Mark)

1. Which of the following enzymes is responsible for breaking down proteins in the stomach?
   (a) Amylase
   (b) Lipase
   (c) Pepsin
   (d) Maltase
2. From the given picture of the digestive system, identify the part labelled as gastric gland.



(a) A
(b) B
(c) C
(d) D

3. The following image shows the bread moulds on bread. How do these fungi obtain nutrition?



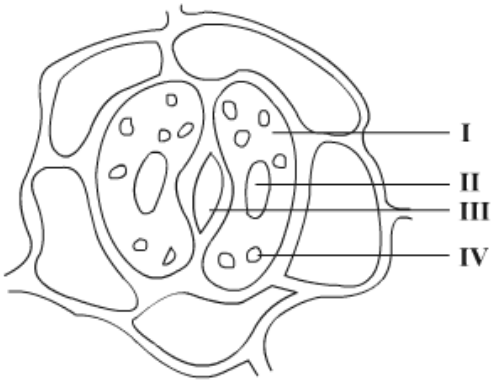
i.

(a) By eating the bread on which it is growing
(b) By using nutrients from the bread to prepare their own food
(c) By breaking down the nutrients of bread and then absorbing them
(d) By allowing other organisms to grow on the bread and then consuming them.

4 Choose the event that does not occur in photosynthesis
(a) Absorption of light energy by chlorophyll
(b) Reduction of carbon dioxide to carbohydrates
(c) Oxidation of carbon to carbon dioxide
(d) Conversion of light energy to chemical energy

5. Which of the following equations is the summary of photosynthesis?
(a) $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$
(b) $6CO_2 + H_2O + \text{Sunlight} \rightarrow C_6H_{12}O_6 + O_2 + 6H_2O$
(c) $6CO_2 + 12H_2O + \text{Chlorophyll} + \text{Sunlight} \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$
(d) $6CO_2 + 12H_2O + \text{Chlorophyll} + \text{Sunlight} \rightarrow C_6H_{12}O_6 + 6CO_2 + 6H_2O$

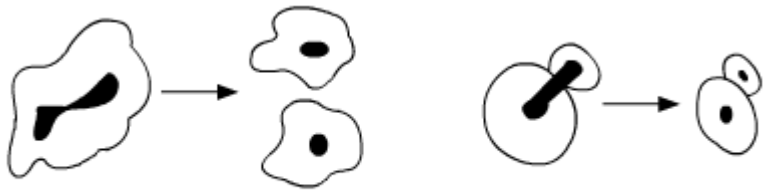
6. In the sketch of stomatal apparatus given alongside, the parts I, II, III and IV were Labelled differently by four students. The correct labelling is shown in.



(a) (I) guard cells, (II) stoma, (III) starch granule, (IV) nucleus
(b) (I) cytoplasm, (II) nucleus, (III) stoma, (IV) chloroplast
(c) (I) guard cells, (II) starch, (III) nucleus, (IV) stoma

(d) (I) cytoplasm, (II) chloroplast, (III) stoma, (IV) nucleus

7. Slides A and B show stages of asexual reproduction in two different organisms.



(A) (B)

The slides A and B are depicting .

(a) binary fission in both Amoeba and Yeast

(b) budding in both Amoeba and Yeast

(c) binary fission in yeast and budding in Amoeba

(d) binary fission in Amoeba and budding in Yeast

Short Answer Questions (1 marks)

8. Name the following

(a) The process in plants that links light energy with chemical energy ----------

(b) Organisms that can prepare their own food ----------

(c) The cell organelle where photosynthesis occurs----------

(d)Cells that surround a stomatal pore----------

(e)Organisms that cannot prepare their own food----------

(f) An enzyme secreted from gastric glands in stomach that acts on proteins.----------

9. How does the acidic medium in the small intestine is converted into alkaline for pancreatic enzymes?(1)

---

10. How do the guard cells regulate opening and closing of stomatal pores? (2)

11. Match the terms in Column (A) with those in Column (B) (2 marks)

Column (A)	Group (B)
(a) Trypsin	(i) Pancreas
(b) Amylase	(ii) Liver
(c) Bile	(iii) Gastric glands
(d) Pepsin	(iv) Saliva

12. Read the following and answer the questions: (4 marks)

Ayush experienced muscular cramps during the training session for his upcoming cricket match . His coach advised him on a schedule of aerobic exercises to overcome this problem. Ayush followed his coach's advice and did not experience any muscular cramps during the game.

i. Lack of oxygen in muscles often leads to cramps due to

a. Conversion of pyruvate to ethanol. b . non-conversion of glucose to pyruvate.

c . conversion of pyruvate to glucose. d . conversion of pyruvate to lactic acid.

ii. Which substances are produced by anaerobic respiration in yeast?

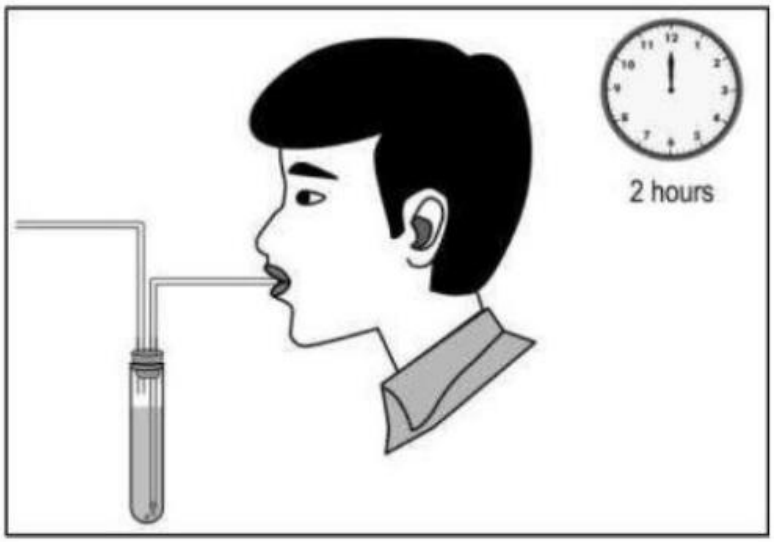
	Lactic acid	Carbon dioxide
A	Yes	Yes
B	Yes	No
C	No	Yes
D	No	No

iii. Why there is an increase in increase in lactic acid concentration in the blood at the beginning of execise?

a. Lack of oxygen
b. Lack of carbondioxide
c. Excess of oxygen
d. Excess of carbon dioxide

iv. . How does aerobic respiration differ from anaerobic respiration?

13. Given below is an image of an experiment conducted by a student to understand the process of respiration. He blows into a clear solution present in the test tube and sees that it turns cloudy. (3 marks)



1.What is the most likely substance present in the test tube?

2 . What could be the aim of his experiment?

3. What kind of respiration is shown in the experiment? Justify your answer.

ANSWERS

MCQ

1. (a) Pepsin
2. (b)
3. (c) By breaking down the nutrients of bread and then absorbing them
4. (c) Oxidation of carbon to carbon dioxide
5. (c) $6CO_2 + 12H_2O$ + Chlorophyll + Sunlight→ $C_6H_{12}O_6 + 6O_2 + 6H_2O$
6. (b) (I) cytoplasm, (II) nucleus, (III) stoma, (IV) chloroplast
7. (d) binary fission in Amoeba and budding in Yeast

Short Answer Questions (1 marks)

8. (a) Photosynthesis
   (b) Autotrophs
   (c) Chloroplast
   (d) Guard cells
   (e) Heterotrophs
   (f) Pepsin
9. . By the action of bile juice secreted by liver.
10. The swelling of guard cells due to absorption of water causes opening of stomatal pores while shrinking of guard cells closes the pores

11. (a) Trypsin - (i) Pancreas

    (b) Amylase - (iv) Saliva

    (c) Bile - (ii) Liver

    (d) Pepsin - (iii) Gastric glands.

12. i. d . conversion of pyruvate to lactic acid

ii. C

iii . a. Lack of oxygen
iv . Aerobic respiration occurs with oxygen and releases more energy but more slowly.

Anaerobic respiration occurs without oxygen and releases less energy but more quickly.

13. 1. Substance is limewater, which is a solution of calcium hydroxide (Ca(OH)2).

2. The student's aim is to prove that carbon dioxide is released during respiration. When carbon dioxide is passed through limewater, it reacts with calcium hydroxide to form calcium carbonate, an insoluble compound that makes the solution appear cloudy or milky.

3. The experiment demonstrates aerobic respiration. This is because the exhaled air contains carbon dioxide, a byproduct of aerobic respiration (the process of using oxygen to produce energy in cells). While fermentation also produces carbon dioxide, it's not the primary process in human cells.

CHAPTER:-6- CONTROL AND COORDINATION

WORKSHEET -(VOLUME-1)

CLASS : X **SUBJECT: SCIENCE(086)**

NAME OF STUDENT:……. **ROLL NO. ……**

MAXIMUM MARKS : 15 **MARKES OBTAINED:…….**

…….

SECTION A

1. The growth movement of plants towards the sunlight is known as : 1

(A) Phototropism (B) Geotropism (C) Hydrotropism (D) Chemotropism

ANS:…….

2. The part of the brain which maintains the posture and balance of the body is : 1
(A) Pons (B) Cerebrum (C) Cerebellum (D) Medulla

ANS:…….

3.In a nerve cell, the site where the electrical impulse is converted into chemical signal is known as: 1

(a) Axon (b) Dendrites (c) Synapse (d) cell body

ANS:……

4. Observe the given figures A and B. When *chhui-mui* (sensitive) plant is touched, its leaves fold. This is due to :

Figure A

Figure B

(A) Hormonal effect (B) Thermal effect
(C) Change in amount of water in cells (D) Electromagnetic effect 1

Ans: ……..

5. Assertion (A) : Chemical co-ordination is seen in both plants and animals.
Reason (R) : Plant hormones control directional growth, whereas in animals, growth is never seen in one direction only. 1

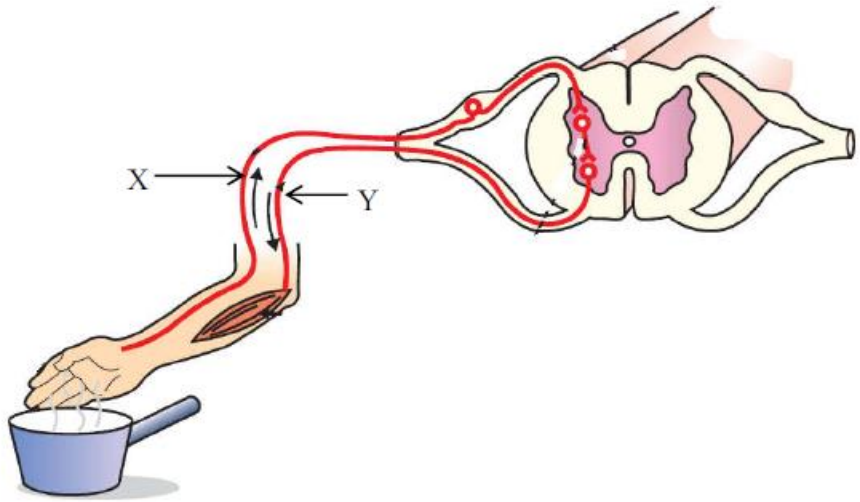
Ans: …….

Section B

6. Name a hormone that promotes the growth of tendrils and explain how they help a pea plant to climb up other plants. 2

Ans.……
……
……
……

7. (a) In the diagram given below, name the labelled parts X and Y. Mention one function for each. 2



ANS:

……
……
……

8. Name the parts of the nervous system which are involved in the following activities : 2

(i) Maintaining body posture (ii) Salivation
(iii) Hunger (iv) Answering a question

……
……
……
…….

9. Define term reflex arc. How voluntary actions are different from the reflex action. 2

……
……
……
……

10. (A) Name the movement which causes "X" and ' Y' to grow downwards and upwards respectively.

(B) Write the name of a hormone that plays a major role in (i) falling of leaves (ii) rapid cell division.
2.

ANS:

……
……
……

MARKING SCHEME

Q	ANSWER	MARKS
1	A) Phototropism	**1**
2	(C) Cerebellum	**1**
3.	(c) Synapse	**1**
4.	(C) Change in amount of water in cells	**1**
5	**Ans:** Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).	**1**
6.	The plant hormone auxin promotes the growth of tendrils, by stimulating cell elongation. When a tendril comes into contact with a support, auxin migrates to the side of the tendril away from the support, causing that side to grow faster and leading the tendril to coil around the support**.**	
7	X- sensory Neuron , Y- Motor Neuron Sensory neurons transmit information from sensory receptors to the central nervous system (CNS), while motor neurons transmit signals from the CNS to muscles, glands, and other effector organs	**½*4**
8	• **Maintaining body posture:** Primarily the cerebellum • **Salivation:** Controlled by the autonomic nervous system (ANS) , specifically the parasympathetic nervous system (PNS) • **Hunger:** hypothalamus in the brain • **Answering a question:** Involves multiple brain regions like the frontal lobe and temporal lobe	**½*4=2**
9	Pathway of reflex action is known as reflex arch. Reflex actions are involuntary and rapid responses to stimuli, whereas voluntary actions are consciously controlled and deliberate.	**1*2 =2**
10	**A** X geotropism , Y- Phototropism B (i) abscisic acid (ii) Cytokinin	**½*4=2**

CHAPTER-7-HOW DO ORGANISMS REPRODUCE

WORSHEET (VOLUME-1)

Time: 30 minutes Max. Marks : 20

Multiple Choice Questions (1Mark)

1. Which event will likely occur in the ovaries of females after attaining puberty?

   a) Fertilisation

   b) Synthesis of eggs

   c) Production of eggs

   d) Growth and development of the embryo

2. Which among the following is not the function of the testes at puberty?

   (i) Formation of germ cells

   (ii) Secretion of testosterone

   (iii) Development of placenta

   (iv) Secretion of estrogen

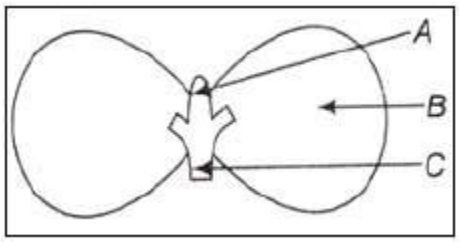
   a) (i) and(ii)

   b) (ii) and(iii)

   c) (iii) and(iv)

   d) (i) and(iv)

3. In the below figure, parts A, B and C are, sequentially,



   a) Cotyledon, plumule and radicle

   b) Plumule, radicle and cotyledon

   c) Plumule, cotyledon and radicle

   d) Radicle, cotyledon and plumule

4. When an organism breaks into a number of parts and each part develop into an individual, it is called:
   a) Budding
   b) Binary fission
   c) Regeneration
   d) Spore formation
5. . The process of release of eggs from the ovary is called

   (a) menstruation
   (b) reproduction
   (c) insemination
   (d) ovulation
6. Anjali placed a bread piece in a moist box. After a few days, she noticed white cottony growth on it. Which method of reproduction is responsible for this growth?
   A. Budding.
   B. Binary fission
   C. Spore formation
   D. Fragmentation
7. Assertion: The testes are located outside the abdominal cavity in the scrotum.
   Reason: Sperm formation requires a temperature slightly lower than body temperature.
   A. Both A and R are true, and R is the correct explanation of A.
   B. Both A and R are true, and R is not the correct explanation of A.
   C. A is true and B is false
   D. A is false and B is true
8. During a lab activity, a student cuts the anthers of a flower. Which function will now be disrupted?
   A. Fertilization.
   B. Pollination
   C. Seed germination
   D. Fruit formation

VERY SHORT ANSWER 2(M) × 2(Q) = 4 (Marks)

9. Name two sexually transmitted infections and state one method to prevent them.

---

10 . Offspring's formed as a result of sexual reproduction produce more variations. Give reason.

SHORT ANSWER 3(Marks)

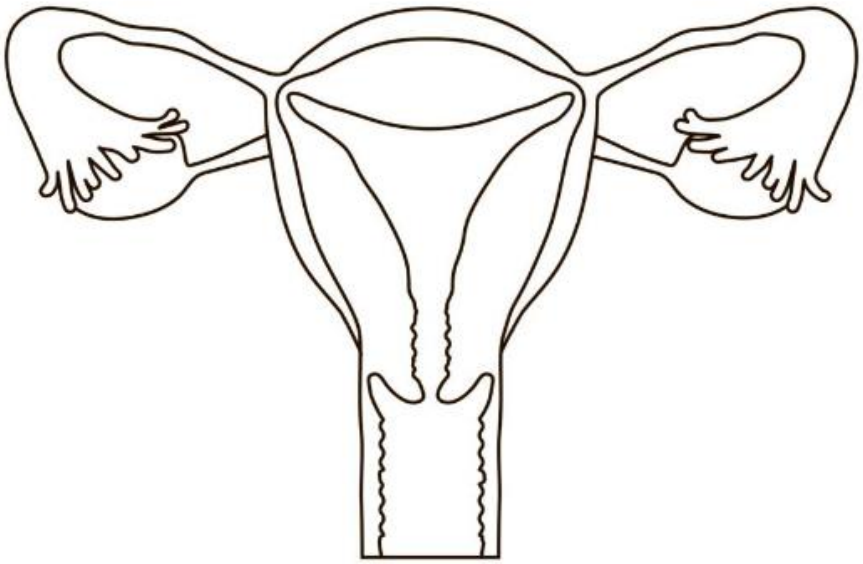
11. (a) Explain the terms:
   (i) Implantation (ii) Placenta

(b) What is the average duration of human pregnancy?

LONG ANSWER 5(Marks)

12. Given below is the diagram of the female reproductive system.
A. Identify and label the part where implantation occurs.
B. Identify and label the part which produces female hormones.
C. Name the female hormones.

D. What happens if egg doesn't meet with sperm?



Answers

1. (c)
2. (c)
3. (c)
4. c) Regeneration
5. (d) ovulation
6. C. Spore formation
7. A
8. B. Pollination
9. HIV, Syphilis, Gonorrhea, Genital herpes (Any two).
   Using Contraceptive devices like condoms
10. They inherit genetic material from two parents, resulting in a mix of traits not present in either parent. This mixing of genetic information increases variation.
11. (i)Implantation is the process where the fertilized egg (blastocyst) attaches to and embeds itself into the lining of the uterus (endometrium). This is a crucial step in establishing a pregnancy, as it allows the embryo to receive nutrients and oxygen from the mother.
    (ii) Placenta: The placenta is a temporary organ that develops during pregnancy, formed from both maternal and fetal tissues. It serves as a vital link between the mother and the fetus,

facilitating the exchange of nutrients, oxygen, and waste products. The placenta also produces hormones that support the pregnancy.
(b) Average Duration of Human Pregnancy: The average duration of human pregnancy is 40 weeks, or 280 days.

12. A. uterus
B .ovary
C. Estrogen and progesterone
D. I If a sperm doesn't fertilize an egg, the egg will disintegrate

CHAPTER-8- HERIDITY

WORKSHEET (VOLUME-1)

CLASS :X **SUBJECT: SCIENCE(086)**

MAXIMUM MARKS : 15 **MARKES OBTAINED:……**

NAME OF STUDENT:……. ROLL NO. ……

……

.1. A zygote which has an X-chromosome inherited from the father will develop into: 1

a) Boy b) Girl c) Either boy or girl d) Cannot be determined

ANS:……

2. Which one of the following statements is **NOT** true? 1

(a) DNA carries the information for inheritance of features from parents to the next generation.
(b) DNA is the information source for making Proteins
(c) Changes in the information leads to different proteins
(d) Features will remain the same even if the protein changes .

ANS: ……..

3. Who is known as the Father of Genetics? 1

a) Watson b) Crick c) Mendel d) Darwin

ANS…….

4. Consider the following statements: 1

(i) The sex of a child is determined by what it inherits from the mother.
(ii) The sex of child is determined by what it inherits from the father .
(iii) The probability of having a male child is more than that of a female child.
(iv) The sex of a child is determined at the time of fertilization when male and female gametes fuse to form a zygote.

The correct statements are

(A) (i) and (iii) B (ii) and (iv) C(iii) and (iv) D (i),(iii) and (iv)

5. **Assertion (A)** : A human child bears all the basic features of human beings.

Reason (R) *:* It looks exactly like its parents, showing very little variations 1

ANS: ……

SECTION B

6. Pure -Tall (TT) pea plants are crossed with pure Dwarf (tt) pea plants. Pea plants obtained in F1 generation are then self pollinated to produce F2 generation . 2

(i) What do the plants of F1 generation look -like? Justify your answer.
(ii) What is the ratio of Pure -tall plants to pure dwarf plants in F2 generation?

ANS……
……
……..

7. Explain how equal genetic contribution of male and female parents is 2

ensured in the progeny. Or

It is a matter of chance whether a couple will give birth to a male or female child'. Justify this statement with the help of a flow chart showing the fusion of sex chromosome.

ANS:
……
……
……
…….

8. A woman with blood group O married a man with AB group. Show the possible blood groups of progeny. List the alleles in this inheritance. 2

……
……
……
…….

9. State the meaning of Acquired and inherited traits. Which of the two is not Passes on the Next generation? Explain with the help of Example. 2

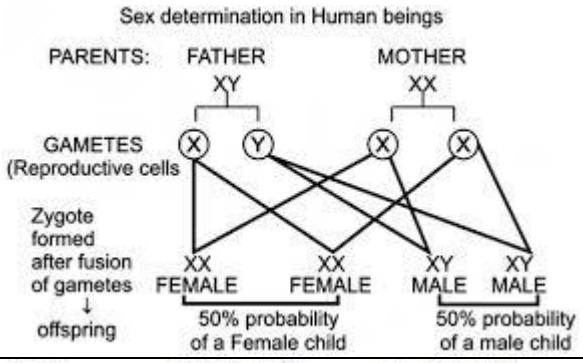
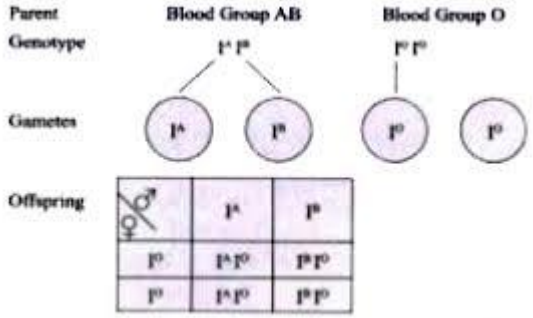
……
……
……
……

10. The gene combination of purple flowered pea plants is denoted as (WW) and that of white flowered pea plants as (ww), when these two plants are crossed F1 generation is obtained.

(a) List two observations made by Mendel in F1 generation plants.
(b) Give the (i) percentage of white flowered plants and (ii) ratio of the gene combination WW, Ww and ww in F2 generation.. 2
ANS:
……
……
…….

MARKING SCHEME

1	b) Girl	1
2	(d).Features will remain the same even if the protein changes	1
3	c) Mendel	1
4	B (ii) and (iv)	1
5	The assertion is true, but the reason is false.	1

6	In the F1 generation, all plants will appear tall because the tall allele (T) is dominant over the dwarf allele (t). In the F2 generation, the ratio of pure tall (TT) to pure dwarf (tt) plants will be 1:1	1+1
7	The sex of a child is determined by the sex chromosomes contributed by the parents during fertilization 	½*4
8		½*4
9	Acquired traits are characteristics developed during an individual's lifetime due to environmental factors or experiences, while inherited traits are characteristics passed down from parents to offspring through genes. Acquired traits cannot be passed on to the next generation. Ex driving skill., playing instruments.	½*4
10	In Mendel's F1 generation all offspring had purple flowers. Dominant traits are expressed with only one allele In the F2 generation, 25% of the plants had white flowers, WW: Ww: ww gene combinations was 1:2:1.	½*4

CHAPTER- 9-LIGHT REFLECTION AND REFRACTION

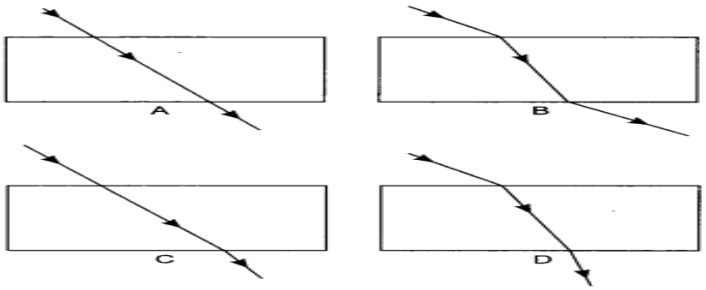
WORKSHEET – 1 (VOLUME-01)

TIME-40 MIN **MM=34 M**

SECTION- A :**MCQ (1X5=5M)**

1. A doctor uses a head mirror to focus light on the internal body parts such as teeth, ear, nose and throat. Which mirror is it? **a.** Plane **b.** Parabolic **c.** Convex **d.** Concave

2. The path of a ray of light coming from air passing through a rectangular glass slab traced by four students is shown as A, B, C and D in the figure. Which one of them is correct –



a. A b. B c. C d. D

3. The SI unit of power of lens is: a. Metre b. Centimetre c. dioptre d. $m^{-}1$

In **(Q.no.4 & 5)** a statement of Assertion is followed by a statement of reason . Mark the correct choice as :

(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) Assertion is true but R is false.
(d) R is true but A is false.

4. **Assertion**: Refractive index has no units.
Reason : The refractive index is a ratio of two similar quantities.

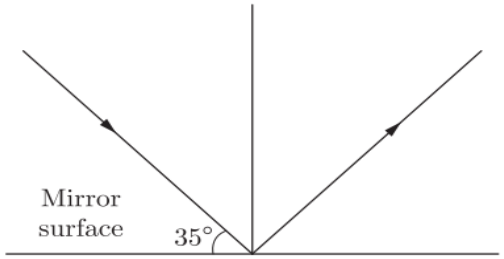
---

5. **Assertion**: A virtual image cannot be photographed.
Reason : Real objects can be photographed.

SECTION B : VERY SHORT ANSWER QUESTIONS (2MX3=6M)

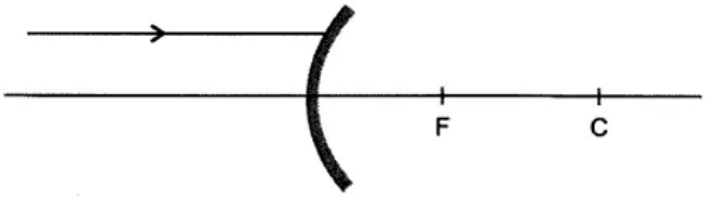
6. Draw a ray diagram to show the refraction of light through a glass prism. Mark on it: (a) the incident ray (b) the emergent ray (c) the angle of deviation

7. a) Find the angle of incidence and angle of reflection from the diagram.



b) Define reflection of light.

8. a. Redraw the diagram given below in your answer book and show the direction of the light ray after reflection from the mirror.



b. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it?

SECTION C : Short answer questions (3MX3=9M) **9. a)**
State Snell's laws of refraction.

b) When a ray of light travelling in air enters obliquely into a glass slab, it is observed that the light ray emerges parallel to the incident ray but it is shifted sideways slightly. Draw a ray diagram to illustrate it.

10. Write one similarity and one dissimilarity between image formed by plane mirror and convex mirror. State two uses of convex mirror.

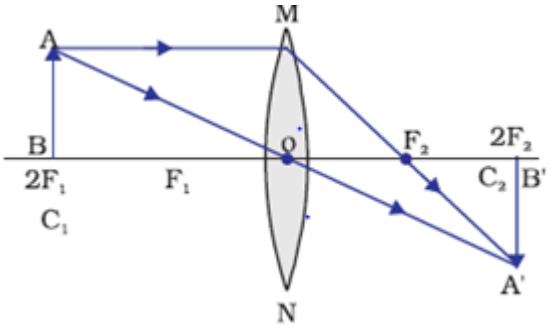
_____

_____

_____

_____

11.a) Following diagram shows the formation of image of an object placed at 2F1, Mention the type of lens used and nature of the image.



_____

_____

b) The radius of curvature of a spherical mirror is 20 cm. What is its focal length?

_____

_____

SECTION D : Long answer questions (5MX2=10M))

12. (a) Define the following terms in the context of spherical mirrors:

(i) Pole

_____

_____ (ii) Centre of curvature

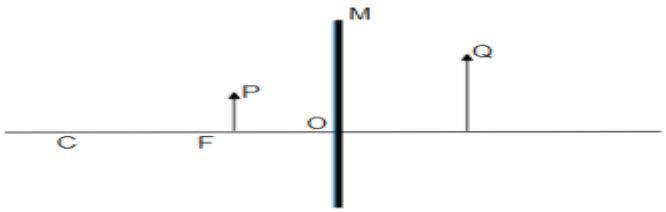
_____

_____

(b) Draw ray diagrams to show the principal focus of a:

(i) Concave mirror (ii) Convex mirror

(c) Consider the following diagram in which M is a mirror and P is an object and Q is its magnified image formed by the mirror.



State the type of the mirror M and one characteristic property of the image

_____

_____

13. The ability of a medium to refract light is also expressed in terms of its optical density. optical density has a definite connotation. It actually means optically rarer medium and optically denser medium. The one with the larger refractive index is optically denser medium lower refractive index is Optically rarer. The speed of light varies in both medium.

a) What is optical density?

_____

b) What is an optically rarer medium?

_____

c) What happens to a ray of light if it travels from an Optically denser to an Optically rarer medium?

_____

d) If light ray passes from glass to water what is the speed of light?

_____

SECTION D : Case based questions (4MX1=4M)

14. CAS**E :** The spherical mirror forms different types of images when the object is placed at different locations. When the image is formed on screen, the image is real and when the image does not form on screen, the image is virtual. When the two reflected rays meet actually, the image is real and when they appear to meet, the image is virtual.
A concave mirror always forms a real and inverted image for different positions of the object. But if the object is placed between the focus and pole. the image formed is virtual and erect.
A convex mirror always forms a virtual, erect and diminished image. A concave mirror is used as doctor's head mirror to focus light on body parts like eyes, ears, nose etc., to be examined because it can form erect and magnified image of the object. The convex mirror is used as a rear-view mirror in automobiles because it can form a small and erect image of an object.
(i) When an object is placed at the centre of curvature of a concave mirror, the image formed is :
(a) larger than the object (b) smaller than the object
(c) same size as that of the object (d) highly enlarged
(ii) No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be :
(a) plane (b) concave (c) convex (d) either plane or convex.
(iii) A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of the same size and that of the legs smaller. The following is the order of combinations

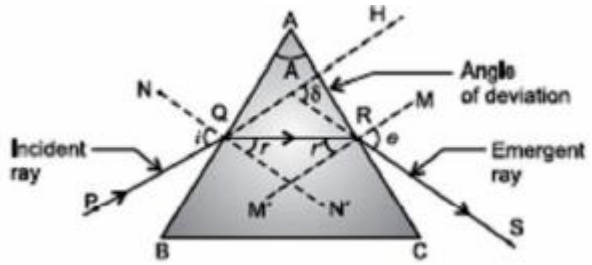
for the magic mirror from the top. (a) Plane, convex and concave (b) Convex, concave and plane (c) Concave, plane and convex (d) Convex, plane and concave

(iv) To get an image larger than the object, one can use : (a) convex mirror but not a concave mirror (b) a concave mirror but not a convex mirror (c) either a convex mirror or a concave mirror (d) a plane mirror

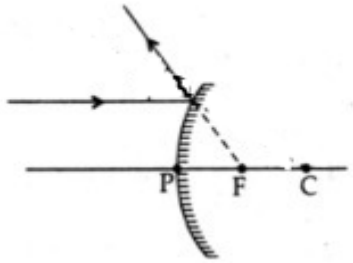
ANSWERS

1. d
2. b
3. c. dioptre
4. (a) Both assertion (A) and (R) are true and reason (R) is the correct explanation of assertion (A).
5.(d) Assertion (A) is false but the reason (R) is true.

6.

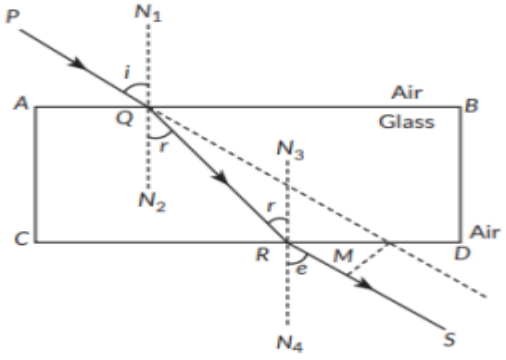


7. a) 55º, 55º as the angle of incidence is equal to angle of reflection.
b**) Reflection of light** is the process of bouncing back light rays in the same medium when it strikes the smooth and shiny reflecting surface.
8.a)



b) Convex mirror

9.a) Snell' law of refraction is:- "the ratio of sine of angle of incident to sine of angle of refraction is always constant for given medium"
where, $\sin i / \sin r = n$ (constant)

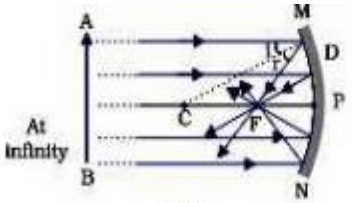


10. Similarity: - Both produce Virtual Image.
Dissimilarity:- Convex Mirror produces diminished image while plane mirror produce the image of the same size as that of the object. 1. Rear view mirror 2. In street lights

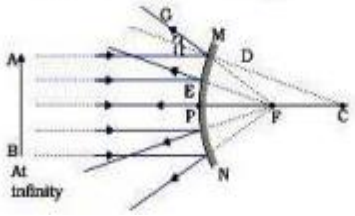
11.a) convex lens, the image is real and inverted b) We know that f = R/2 therefore , f = 20/2 = 10 cm **12.**

a) i) Pole – Centre of the reflecting surface of the mirror.
ii) Centre of curvature – The centre of the hollow sphere of which the reflecting surface of mirror forms a part.

b) i)



ii)



c)
Concave mirror
Image formed is virtual

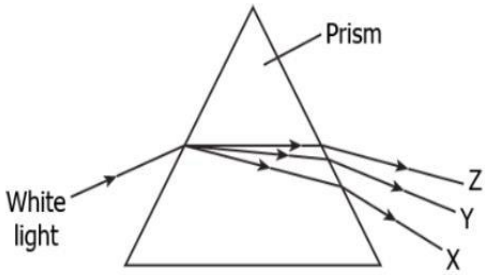
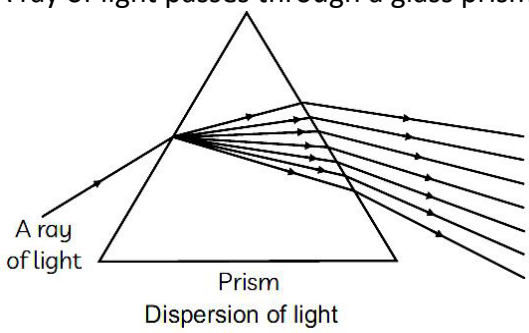
13. a) The ability of a medium to refract light.
b. A medium in which speed of light is more.
c. It bends away from the normal. d. The speed of light increases

14. i.(c) same size as that of the object
ii.(d) either plane or convex.
iii.(c) Concave, plane and convex
iv.(b) a concave mirror but not a convex mirror \

CHAPTER-10-THE HUMAN EYE AND COLOURFUL WORLD

WORKSHEET – 2

TIME-45 MIN **MM=44 M**

1.	The image formed by retina of human eye is - a. Virtual and erect b. Real and inverted c. Virtual and inverted d. Real and erect	1
2.	The change in the focal length of human eye is caused due to - a. Ciliary muscles b. Pupil c. Cornea d. Iris	1
3.	The image shows the dispersion of the white light in the prism –  What will be the colours of the X, Y and Z? (a) X: red; Y: green; Z: violet (b) X: violet; Y: green; Z: red (c) X: green; Y: violet; Z: red (d) X: red; Y: violet; Z: green	1
4.	Assertion (A) : White light is dispersed into its seven-colour components by a pri Reason (R) : Different colours of light bend through different angles with respect to the incident ray as they pass through a prism	1
5.	Assertion (A): Hypermetropia is the defect of the eye in which only farther objects are seen. Reason (R**) :** Hypermetropia is corrected by using converging lens	1
6.	A man is wearing glasses of focal length + 1m, what can be the defect in the eye?	2
7.	Define the term power of accommodation.	2
8.	In which type of eye defect far point of the eye gets reduced?	2
9.	A short-sighted person cannot see clearly object beyond 5cm. Calculate the power of lens required to correct his vision to normal?	2
10.	Is the position of a star as seen by us its true position? Justify your answer?	3
11.	Make a diagram to show how hypermetropia is corrected.	3
12.	Explain the phenomenon of dispersion of white light through a glass prism, using suitable ray diagram?	3
13.	A ray of light passes through a glass prism.  When do the light rays get refracted?	3

14.	a) Explain why the planets do not twinkle? b) Why do we see a rainbow in the sky only after rainfall?	5
15.	A person needs a lens of power -5.5 dioptres for correcting his distant vision. For correcting his near vision he needs a lens power+1.5 dioptre. What is the focal length of the lens required for correcting – a) distant vision and b) near vision?	5
16.	Explain human eye on the basis of the following: a) Diagram b) working c) function of Iris and Pupil	5
17.	CASE :The spreading of light by the air molecules is called scattering of light. The light having least wavelength scatters more. The sun appears red at sunrise and sunset, appearance of blue sky it is due to the scattering of light. The colour of the scattered light depends on the size of particles. The smaller the molecules in the atmosphere scatter smaller wavelengths of light. The amount of scattering of light depends on the wavelength of light. When light from sun enters the earth's atmosphere, it gets scattered by the dust particles and air molecules present in the atmosphere. The path of sunlight entering in the dark room through a fine hole is seen because of scattering of the sun light by the dust particles present in its path inside the room. A. At the time of sunrise and sunset, the light from sun has to travel. a) longest distance of atmosphere b) shortest distance of atmosphere c) both (a) and (b) d) can't say B. The colour of sky appears blue, it is due to the (a) refraction of light through the atmosphere b) dispersion of light by air molecules c) scattering of light by air molecules d) all of these. C. The danger signs made red in colour, because a) the red light can be seen from farthest distance b) both (a) and (b) c) the scattering of red light is least d) none of these D. The colour of the scattered light depends on the a) size of the particles b) weight of the particles c) volume of the particles d) height of the particles	4

ANSWERS

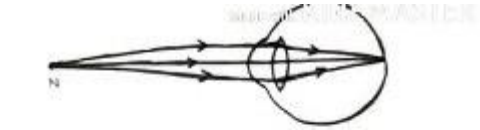
1. b. Real and inverted
2. a. Ciliary muscles
3. b. X: violet; Y: green; Z: red
4. (a) Both A and R are true and R is the correct explanation of A.
5. b) Both A and R are true but R is not the correct explanation of A.
6. The man is likely suffering from hypermetropia, because positive focal length indicates convex lens which is used to correct hypermetropia. So the eye cannot focus on nearby objects clearly but distant objects are visible.
7. The ability of the eye lens to adjust its focal length is called power of accommodation.
8. In myopia the far point of eye gets reduced, as the far point which is normally at infinity is closer than that for a myopic eye.
9. The power of lens is given by $P = \frac{1}{f(m)}$

$P = \frac{1}{-0.05}$

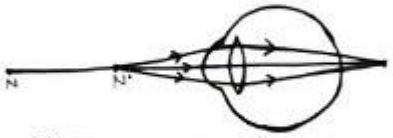
P = -20 D

The power of the lens required to correct the vision is -20 D.

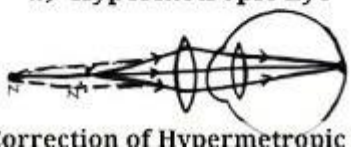
10. Star light undergo continuous refraction on entering earth's atmosphere. Refraction occurs in a medium of gradually changing refractive index. Since the atmosphere bends starlight towards the normal, the apparent position of the star is slightly different from its actual position. The star appears slightly higher (above) than its actual position.
11. Hypermetropic and its correction :



a) Near Point of Hypermetropic Eye



b) Hypermetropic Eye



c) Correction of Hypermetropic Eye

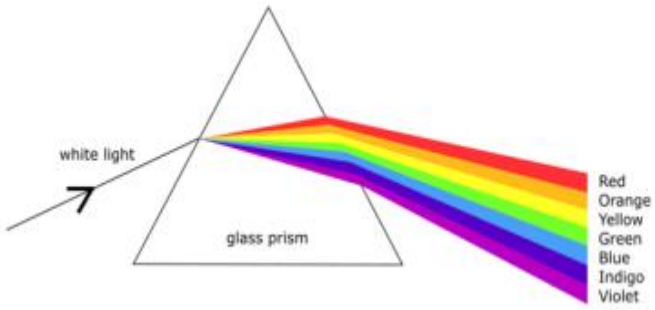
12. Dispersion is the phenomenon of splitting white light into its constituent colours. Different colours of light have different wavelengths, which causes them to refract at different angles when passing through a prism.

The amount of bending (refraction) is inversely proportional to the wavelength of light.

Red light, having the longest wavelength, bends the least, while violet light, with the shortest wavelength, bends the most.

Order of colours from bottom to top: remembering keyword **VIBGYOR**

V - Violet, I - Indigo, B - Blue, G - Green, Y - Yellow, O - Orange and R - Red.



13. Light rays get refracted whenever they travel into a medium with a different refractive index. In the diagram light ray enters the prism from the air and the light ray moves from the prism into the air, the refraction take place.

.

14. a) Planets do not twinkle like stars because planets are much closer to the earth and are thus seen as extended objects. If we consider planet as a collection of large number of point-sized sources of light, sources of light the variation in amount of light entering our eye from all the individual point sized sources will average out to zero, thereby nullifying the twinkling effect.

b) Rainbow is caused by dispersion of sunlight by tiny water droplets, present in the atmosphere. A rainbow is always formed in a direction opposite to that of the Sun. The water droplets act like small prisms. They refract and disperse the incident sunlight, then reflect it internally, and finally refract it again when it comes out of the raindrop.

15. i) (i) for far sight :

P = – 5.5 D Power of lens = 1/f (in m)

∴ f = 1/P

f = 1/(-5.5)

f = -10/15

f = – 0.182 = – 0.18 m

(ii) for near sight

P = + 1.5

∴ P = 1/f (in m)

∴ f = 1/P

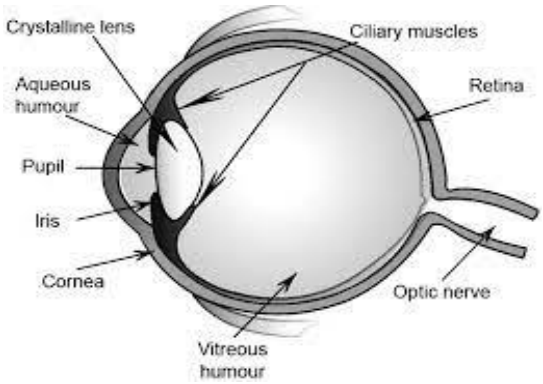
f = 1/1.5

f = 10/15

f = 2/3

f = 0.66 cm = 0.67 cm

16. Structure of human eye



Light rays coming from the object to be seen can enter the eye through pupil and fall on the eye lens. The eye lens being convex, forms a real and inverted image on the retina. The light sensitive cell of the retina gets activated upon illumination and generate electric signals. These signals are sent to the brain via the optic nerve. The brain interprets these signals and finally gives rise to the sensation of vision.

The iris adjusts the size of the pupil according to the intensity of light received by the eye.

The pupil regulates and controls the amount of light entering the eye.

17. A) a. longest distance of atmosphere B) c. scattering of light by air molecules

C) b. both (a) and (b) D) a. size of the particles

CHAPTER-11-ELECTRICITY

WORKSHEET: (VOLUME-I)

CLASS 10	NAME:

SUBJECT – SCIENCE	DATE:
TIME -30 MIN	**MM=29 M**

SECTION A: MCQ TYPE (1 MARK EACH)

1. Unit of electric power may also be expressed as

(a) volt ampere (b) kilowatt hour (c) watt second (d) joule second

……

2. When electric current is passed, electrons move from:
   (a) high potential to low potential.
   (b) low potential to high potential.
   (c) in the direction of the current.
   (d) against the direction of the current.

   ……
3. The heating element of an electric iron is made up of:
   (a) copper
   (b) nichrome
   (c) aluminium
   (d) iron

   ……
4. The electrical resistance of insulators is
   (a) high
   (b) low
   (c) zero
   (d) infinitely high

   ……
5. Electric power is inversely proportional to
   (a) resistance
   (b) voltage
   (c) current
   (d) temperature

   ASSERSION- REASON QUESTIONS-

Option A: Both A and R are true, and R is the correct explanation of A.
Option B: Both A and R are true, but R is not the correct explanation of A.
Option C: A is true, but R is false.
Option D: A is false, but R is true.
Option E: Both A and R are false.

6. Assertion (A) : Tungsten metal is used for making filaments of incandescent lamps.
   Reason (R) : The melting point of tungsten is very low.

   ……..
7. Assertion (A) : Alloys are commonly used in electrical heating devices, like electrical iron, toasters etc.
   Reason (R) : Alloys do not oxidise (burn) readily at high temperatures.

   ……..

SECTION B SHORT ANSWER TYPE QUESTION (2MX4=8M)

8. State the relationship between 1 ampere and 1 coulomb?
   Name the physical quantity whose unit is volt ampere?
   ……
   ……
   ……
   ……
   ……
   ……
9. A wire of resistivity 10Ωm is stretched to double its length. What is its new resistivity. Why?
   ……
   ……
   ……
   ……
   ……
   ……
10. Which has more resistance: 100W bulb or 60W bulb. Why?
   ……
   ……
   ……
   ……
   ……
   ……
11. Why does an electric bulb become dim when an electric heater in parallel circuit is switched on? Why does dimness decrease after sometime?
   ……
   ……
   ……
   ……
   ……
   ……

LONG ANSWER QUESTIONS (5MX2=10M)

12. State and explain Ohm's law. Define resistance and give its SI unit. What is meant by 1 ohm resistance? Draw V-I graph for an ohmic conductor and list its two important features.
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……

……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……
……

13. The resistance of a wire of 0.01 cm radius is 10 Ω. If the resistivity of the material of the wire is 50×10^{-8} ohm meter, find the length of the wire.

……
……
……
……
……
……
……
……
……
……
……
……

……
……
……
……
……
……

……
……
……
……
……
……

……
……
……
……
……
……

……
……
……
……
……
……

CASE BASED QUESTIONS (4MX1=4)

14. (a) Rohan have two resistors of R_1 Ω .He wants to connect both resistors in such a way that a battery of emf V volts formed so that the electrical power consumed is minimum? Help him to connected two resistors, with resistances R_1 Ω and R_1 Ω respectively that he comes to desire result?
(b) In his house 3 bulbs of 100 watt each lighted for 5 hours daily, 2 fans of 50 watt each used for 10 hours daily and an electric heater of 1.00 kW is used for half an hour daily. Calculate the total energy consumed in a month of 31 days and its cost at the rate of Rs 3.60 per kWh.

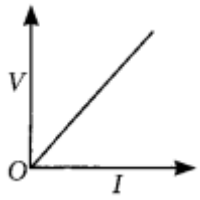
……
……
……
……
……
……..
……
……
……
……
……
……

……
……
……
……
……
……..

……
……
……
……
……
……

MARKING SCHEME

Q	ANSWERS	MARKS
1.	B	1
2.	B	1
3.	B	1
4.	D	1
5.	A	1
6.	C	1
7.	A	1
8.	1ampere = 1coulomb/1second.	1+1

	Resistance.	
9.	It remains same because resistivity depends on nature of material.	2
10.	The resistance of 60W bulb is more. Because R is inversely proportional to P for constant V.	2
11.	The resistance of a heater coil is less than that of electric blub filament. When the heater is switched on in parallel, more current start flowing through the heater coil and current through bulb filament decreases making it dim.After sometime, when the heater coil becomes hot its resistance increases. As a result, current though the heater coil decreases and the current through the bulb filament increases and thus dimness of the bulb decreases. .	2
12	Resistance : It is ihe properly of a conductor lo resist the How of charges through it. Its SI unit is ohm (Ω). If the potential difference across the two ends of a conductor is 1 V and the current through it is 1 A, then the resistance R, of the conductor is 1 ohm (1 Ω). lvolt 1 ohm = 1volt1ampere V-I graph for an ohmic conductor can be drawn as given in figure.  Important feature of V-I graph are: (i) It is a straight line passing through origin. (ii) Slope of V-I graph gives the value of resistance of conductor slope = R = VI	5 M
13.	Answer: Here, r = 0.01 cm = 10^{-4} m, ρ = 50 × 10^{-8} Ω m and R = 10 Ω As, R = ρlA or l = RAρ=Rρ(πr2) so l = 1050×10−83.14×(10−4)2 = 0.628 m = 62.8 cm	5
14.	Answer: (a) Power consumed is minimum when current through the circuit is minimum, so the two resistors are connected in series. (b) Power of each bulb P_1 = 100 watt Total power of 3 bulbs, P_1 = 3 × 100 = 300 watt Energy consumed by bulbs in 1 day $E_1 = P_1 \times t$ = 300 watt × 5 hours. = 1500 Wh = 1.5 kWh Power of each fan = 50 watt Total power of 2 fans = 2 × 50 watt P_2 = 100 watt Energy consumed by fans in 1 day $E_2 = P_2 \times t$ = 100 watt × 10 hours = 1000 watt hour = 1 kWh Energy consumed by heater, E_3 = 1 kW × 1/2 h = 0.5 kWh Total energy consumed in one day $E = E_1 + E_2 + E_3$ = (1.5 + 1 + 0.5) kWh = 3 kWh Total energy consumed in a month of 31 days	4

	= E × 31 = (3 × 31) kWh = 93 kWh Cost of energy consumed = Rs (93 × 3.60) = Rs 334.80	
15.		

CHAPTER-13- OUR ENVIRONMENT
WORKSHEET (VOLUME-1)

CLASS 10	NAME:
SUBJECT – SCIENCE	DATE:
TIME-20 MIN	**MM- 21MARKS**

	SECTION –A(MCQ)	
1	Which of the following is a biodegradable substance? (a) Glass (b) DDT (c) Vegetable peels (d) Plastic	**1**
2	Which trophic level in a food chain has the least amount of energy? (a) Producers (b) Primary consumers (c) Secondary consumers (d) Top carnivores	**1**
3	Which gas is mainly responsible for the depletion of the ozone layer? (a) CO_2 (b) CH_4 (c) CFCs (d) SO_2	**1**
4	Which of the following is a correct sequence in a terrestrial food chain? (a) Grass → Cow → Human → Lion (b) Grass → Grasshopper → Frog → Snake (c) Human → Rice → Cow → Lion (d) Snake → Frog → Grasshopper → Grass	**1**
5	*Choose the correct option:* (a) Both A and R are true, and R explains A. (b) Both A and R are true, but R does not explain A. (c) A is true, R is false. (d) A is false, R is true. **Assertion (A):** Aquarium needs regular cleaning. **Reason (R):** There are no decomposers to clean the waste in aquariums.	**1**
6	**Assertion (A):** Food chain is responsible for entry of harmful chemicals in our body. **Reason (R):** The length of food chain determines amount of energy lost.	**1**
	SECTION –B(VSA)	
7	Define biodegradable waste with an example. Ans-	**2**
8	What is meant by trophic level? Ans-	**2**
9	What is biological magnification?	**2**

	Ans-	
	SECTION –C(SA)	
10	What will happen if decomposers are removed from the ecosystem? Ans-	**3**
11	Why should biodegradable and non-biodegradable wastes be disposed of separately? Ans-	**3**
12	Why are food chains generally limited to 3–4 trophic levels only? Ans-	**3**

ANSWER KEY

Section A: MCQs

1. (c) Vegetable peels
2. (d) Top carnivores
3. (c) CFCs $_2$
4. (b) Grass → Grasshopper → Frog → Snake

Assertion and Reason)

5 Ans: (a)

6. Ans: (b)

Section B: Very Short Answer Questions

7.**Ans:** Substances that can be broken down by microorganisms (e.g., vegetable peels).

8. **Ans:** Each step or level in a food chain is called a trophic level.
9.Ans: Increase in the concentration of harmful chemicals at each trophic level.

Section C: Short Answer Questions (3 Marks)

10Ans: Dead organisms would accumulate; nutrients won't be recycled; ecosystem balance will be disturbed.

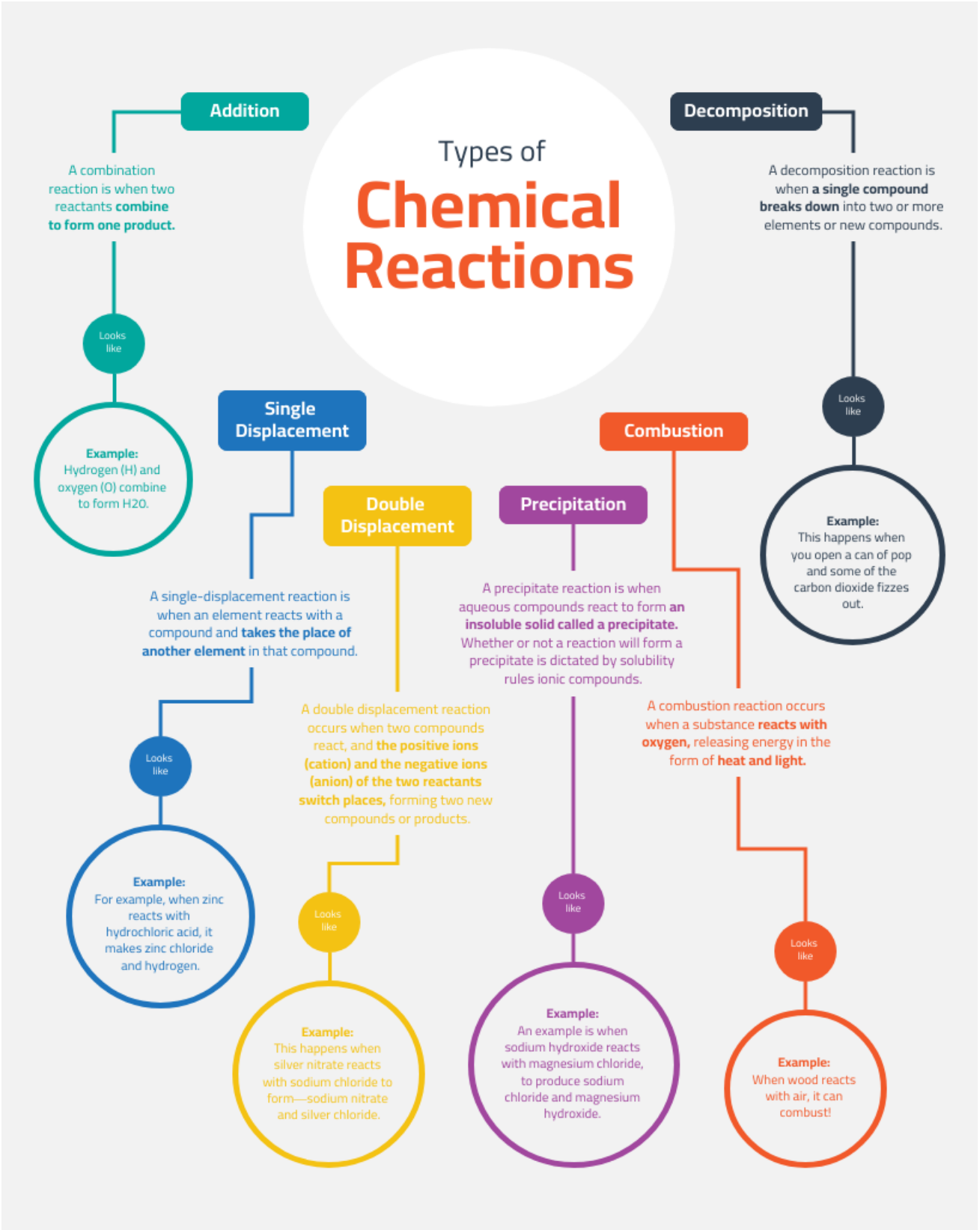
11.Ans: Biodegradable waste can decompose; non-biodegradable harms the environment and should be recycled.

12.**Ans:** Because only 10% energy passes to the next level; energy becomes insufficient for more levels.

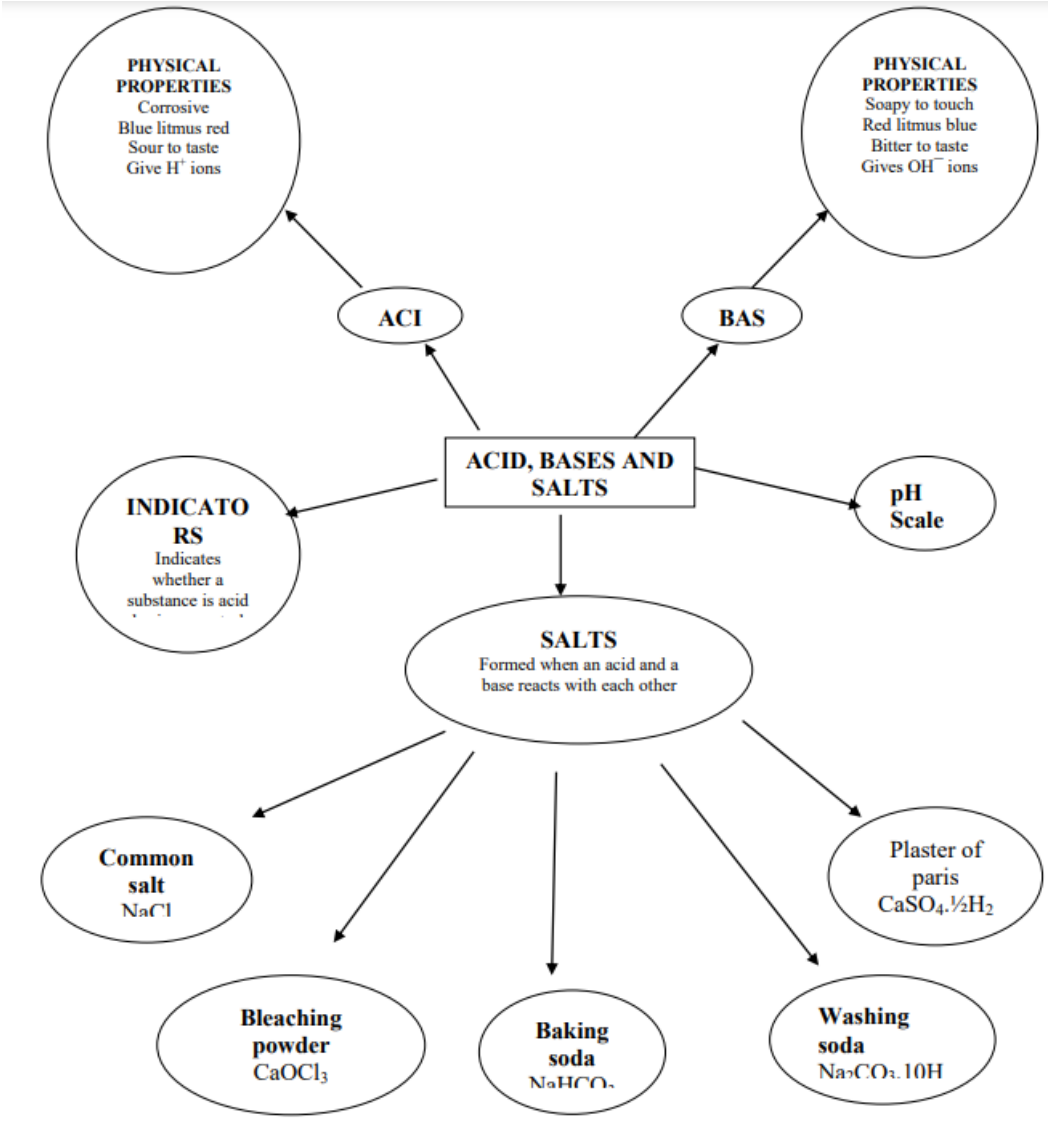
.

CONCEPT MAP

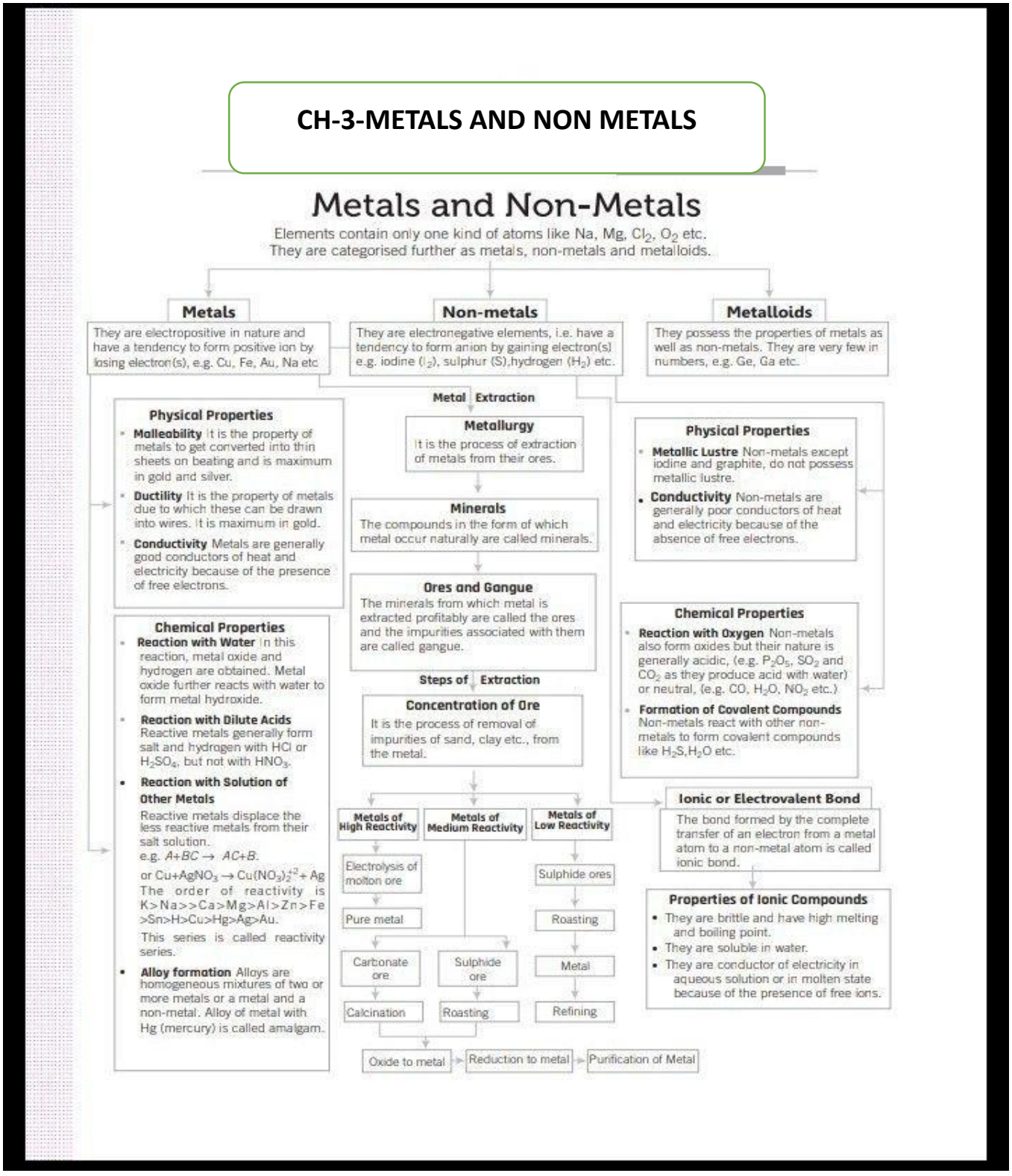
CHAPTER-1-CHEMICAL REACTIONS AND EQUATIONS



CHAPTER- 2-ACIDS, BASES ASALTS- MIND MAP



CH-3-METALS AND NON-METALS- MIND MAP



Class X Science
MIND MAP for Carbon and its Compounds

PROPERTIES AND VERSATILE NATURE OF CARBON

- Always forms covalent bonds
- Tetravalent
- Tetrahedral
- 3 allotropes – diamond, graphite and fullerenes
- Catenation – Unique property of self-linking of carbon atoms

Name of compounds	IUPAC Name
Alkene	Alkane – ane + ene = Alkene
Alkyne	Alkane – ane + yne = Alkyne
Haloalkanes	Halo + alkane = Haloalkane
Alcohols	Alkane – e + ol = Alkanol
Aldehydes	Alkane – e + al = Alkanal
Ketone	Alkane – e + one = Alkanone
Carboxylic acid	Alkane – e + oic acid = Alkanoic acid

CARBON AND ITS COMPOUNDS

Chemical properties of Carbon compounds

Combustion
Burning of carbon compound in air

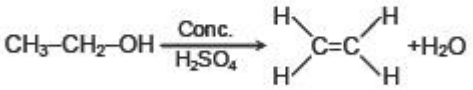
Substitution
Replacement of an atom or a group of atoms in a organic molecule by another atoms or group of atoms

Addition
Addition of two reactants to form a single product

Oxidation
Addition of oxygen

Ethanol

- Colourless, distinct smell and burning taste, soluble in water in all proportions, neutral to litmus
- Reaction with sodium
  $2CH_3CH_2OH + Na \rightarrow CH_3CH_2ONa + H_2$
- Reaction with concentrated H_2SO_4



- Combustion
  $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 2H_2O + Heat$

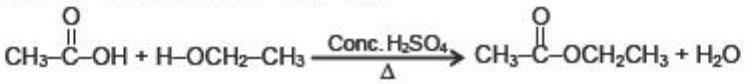
Soaps

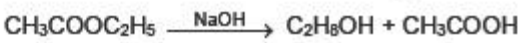
- Sodium salts (or potassium salts) of the long chain carboxylic acids. The ionic group in soaps is $-COO^-Na^+$.
- Not suitable for washing purposes when water is hard.

Detergents

- Sodium salts of long chain benzene sulphonic acids. The ionic group in a detergent is $-SO_3^-Na^+$ or $-SO_4^-\ Na^+$.
- Can be used for washing even when the water is hard.

Ethanoic Acid

- Colourless, pungent smelling liquid, soluble in water in all proportions
- Reaction with sodium carbonate
  $2CH_3COOH + Na_2CO_3 \rightarrow 2CH_3COONa + CO_2 + H_2O$
- Reaction with sodium hydrogen carbonate
  $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + CO_2 + H_2O$
- Esterification 

- Hydrolysis 

CLASS X SCIENCE (2025-26)

CHAPTER 6 LIFE PROCESSES

MIND MAP

LIFE PPROCESSES

RESPIRATION IN ANIMALS (Human Beings)

rts of Human
spiratory system
ostrils, Nasal
ssage
harynx, Larynx
rachea
onchi,
onchioles
lveoli, Lungs
ibs
iaphragm

Mechanism of Breathing
-Inspiration
-Gaseous exchange
-Expiration

NUTRITION

Autotrophic Nutrition in Plants.
Process involved is Photosynthesis.

Heterotrophic Nutrition in Animals.
-Ingestion
-Digestion
-Absorption
-Assimilation
-Egestion

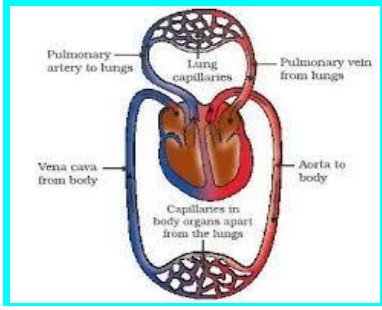
Parts of Alimentary canal
-Mouth
-Pharynx
-Oesophagus
-Stomach
-Small Intestine
-Large Intestine
-Rectum - Anus

TRANSPORTATION

sportation in
s
em
oem

Circulatory system in Humans
-Blood
-Heart
_Blood vessels

Double Circulation In Humans



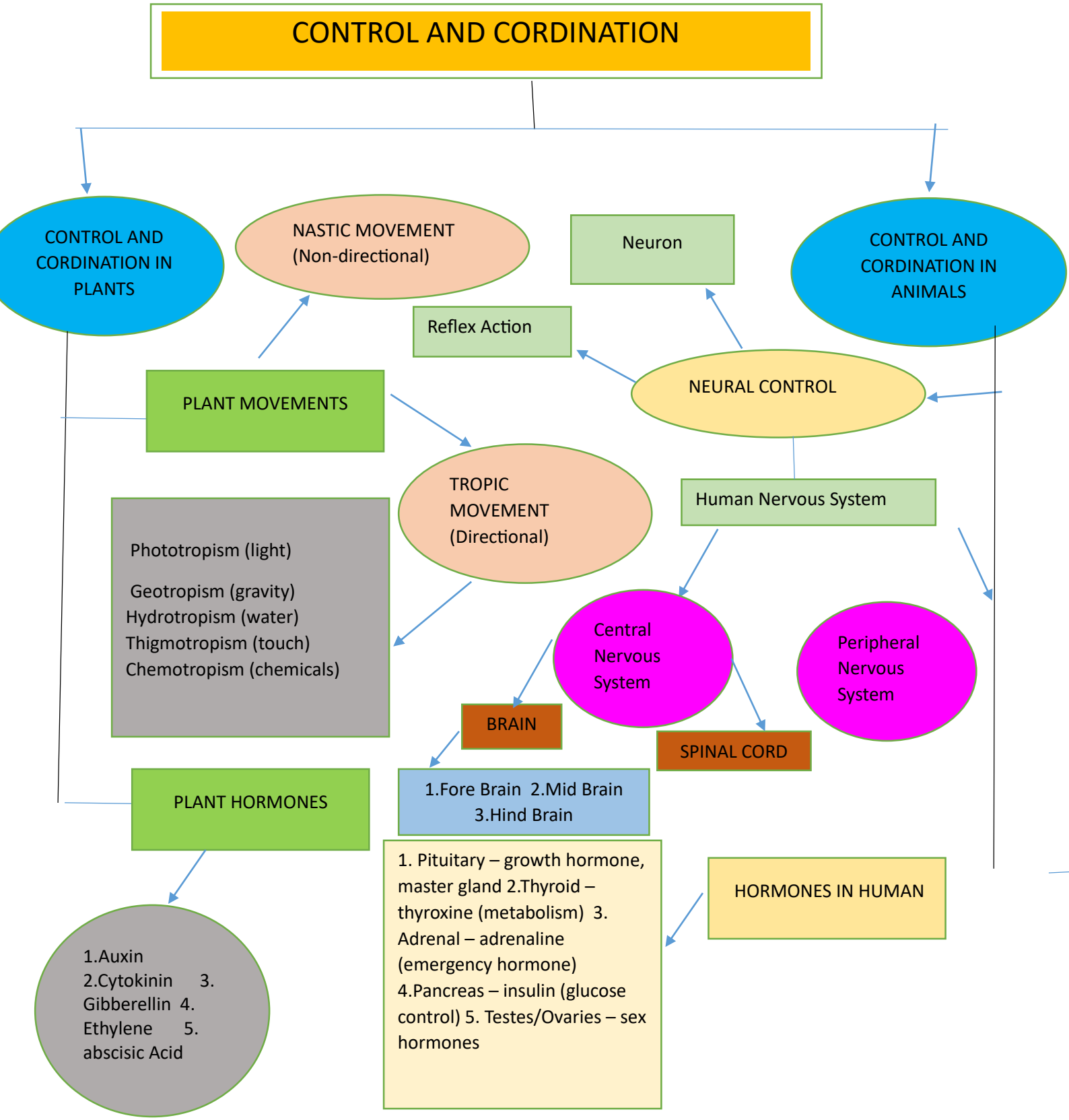
EXCRETION

Basic unit of Kidney- Nephron
Parts of neuron
-Bowman's capsule
-Glomerulus
-PCT
-Loop of Henle
-DCT
-Collecting duct

Plants- Transpiration

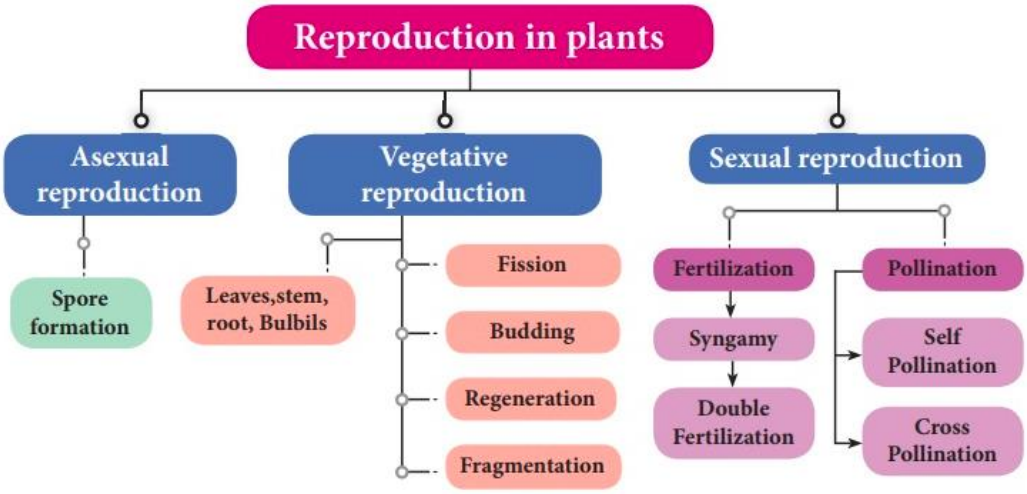
Animals- Kidney helps in formation of Urine

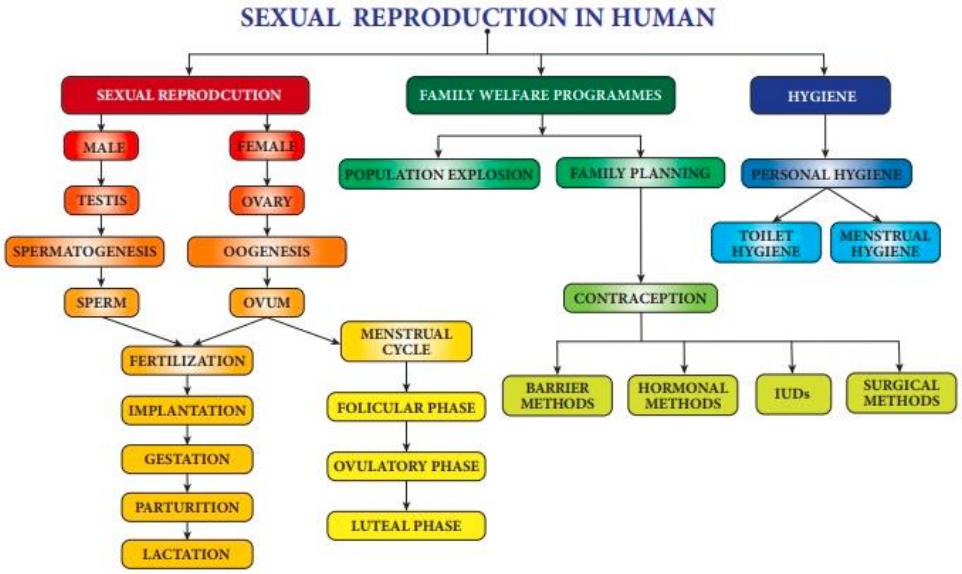
CLASS 10TH

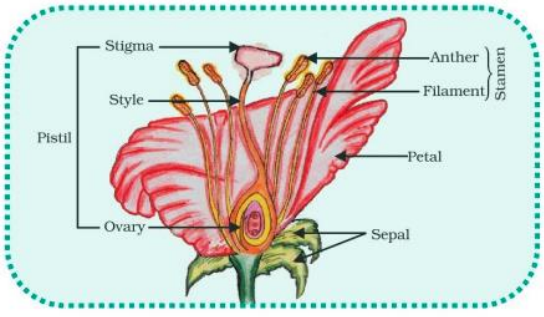

CONTROL AND CORDINATION
CONTROL AND CORDINATION IN PLANTS
NASTIC MOVEMENT (Non-directional)
Neuron
CONTROL AND CORDINATION IN ANIMALS
Reflex Action
PLANT MOVEMENTS
NEURAL CONTROL
TROPIC MOVEMENT (Directional)
Human Nervous System
Phototropism (light)
Geotropism (gravity)
Hydrotropism (water)
Thigmotropism (touch)
Chemotropism (chemicals)
Central Nervous System
Peripheral Nervous System
BRAIN
SPINAL CORD
PLANT HORMONES
1.Fore Brain 2.Mid Brain 3.Hind Brain
1. Pituitary – growth hormone, master gland 2.Thyroid – thyroxine (metabolism) 3. Adrenal – adrenaline (emergency hormone) 4.Pancreas – insulin (glucose control) 5. Testes/Ovaries – sex hormones
HORMONES IN HUMAN
1.Auxin 2.Cytokinin 3. Gibberellin 4. Ethylene 5. abscisic Acid

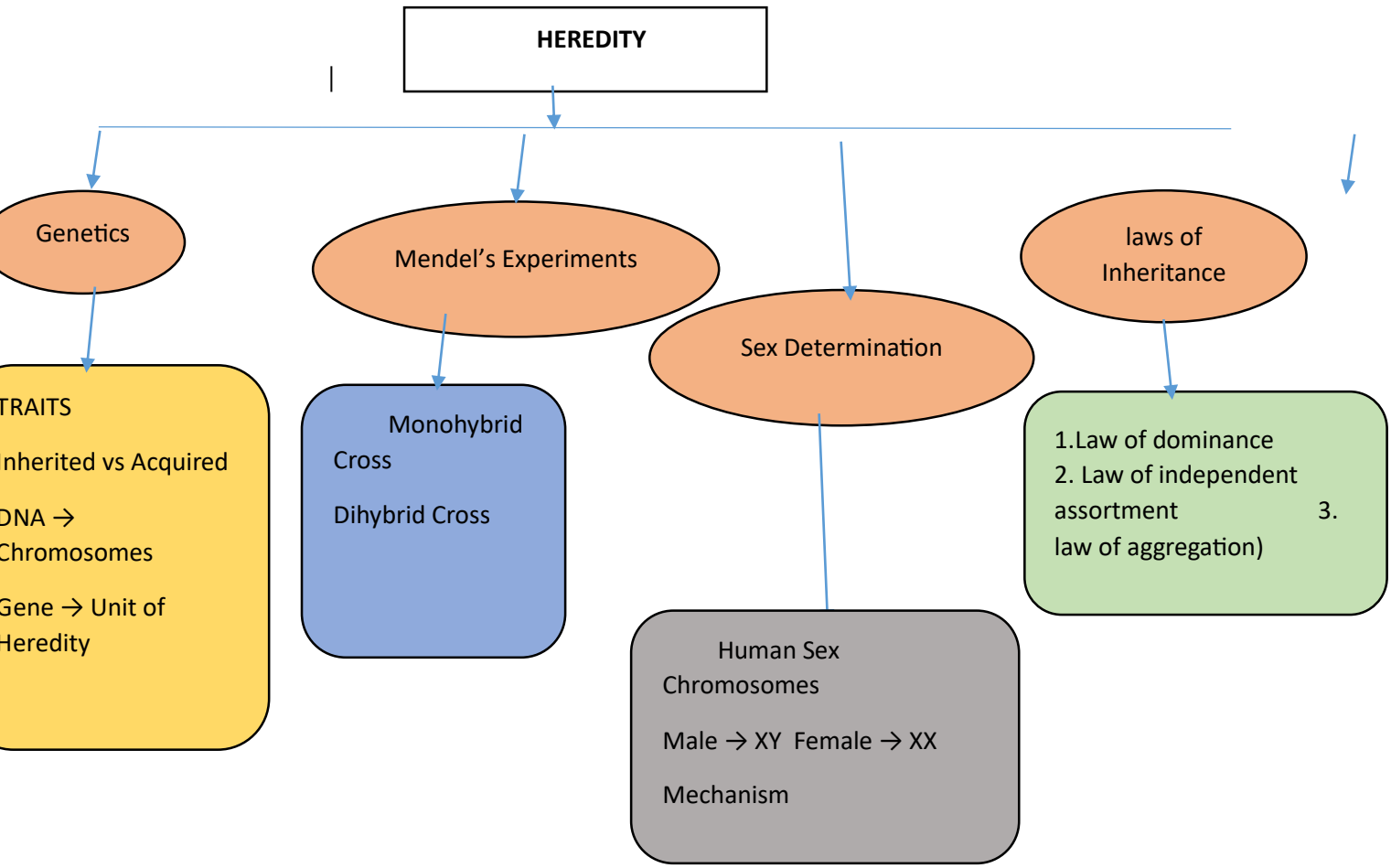
CHAPTER-7-How do Organisms Reproduce?

MIND MAP

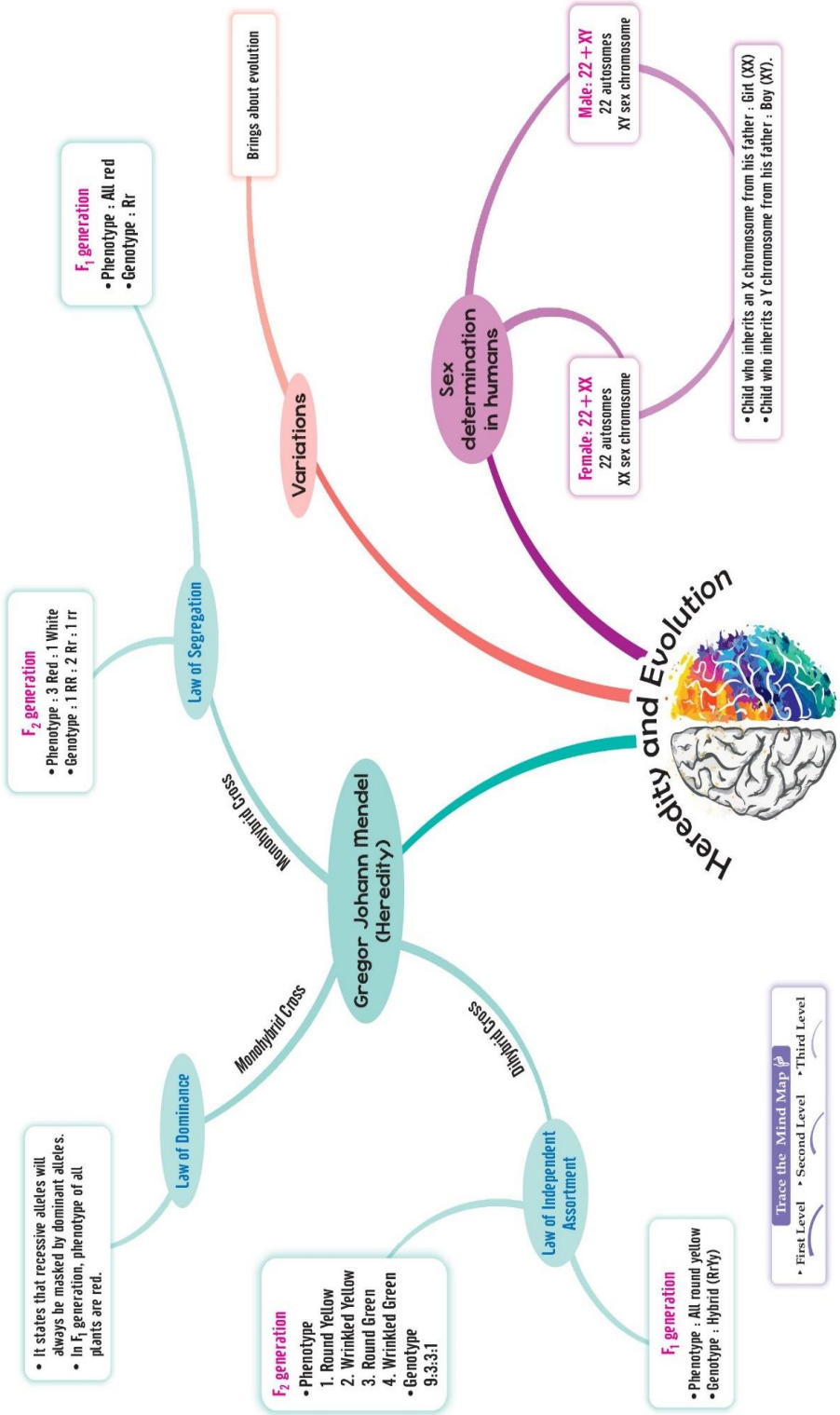






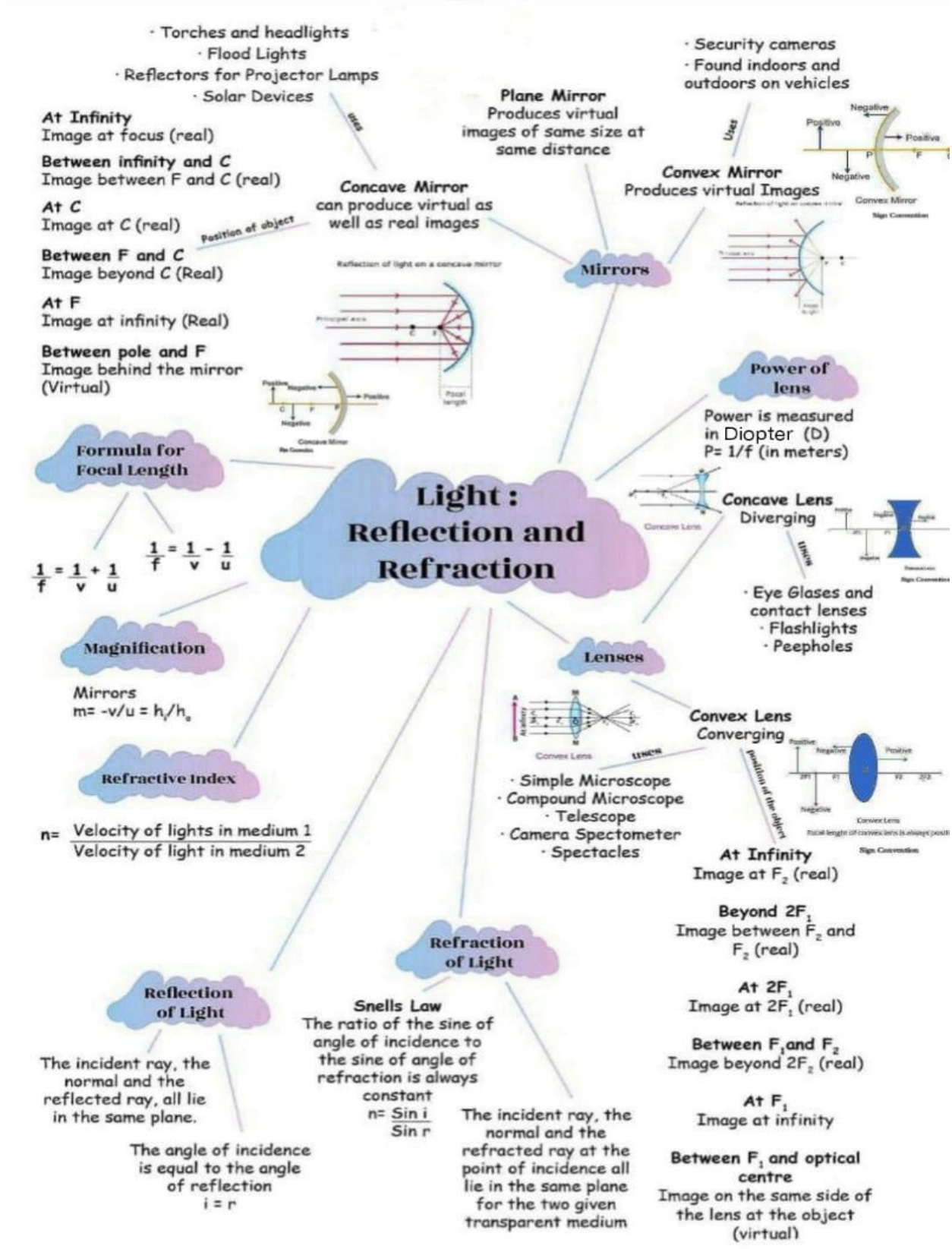

HEREDITY
Genetics
Mendel's Experiments
Sex Determination
laws of Inheritance
TRAITS
Inherited vs Acquired
DNA → Chromosomes
Gene → Unit of Heredity
Monohybrid Cross
Dihybrid Cross
Human Sex Chromosomes
Male → XY Female → XX
Mechanism
1.Law of dominance
2. Law of independent assortment
3. law of aggregation)

CHAPTER-8-HEREDITY –MIND MAP



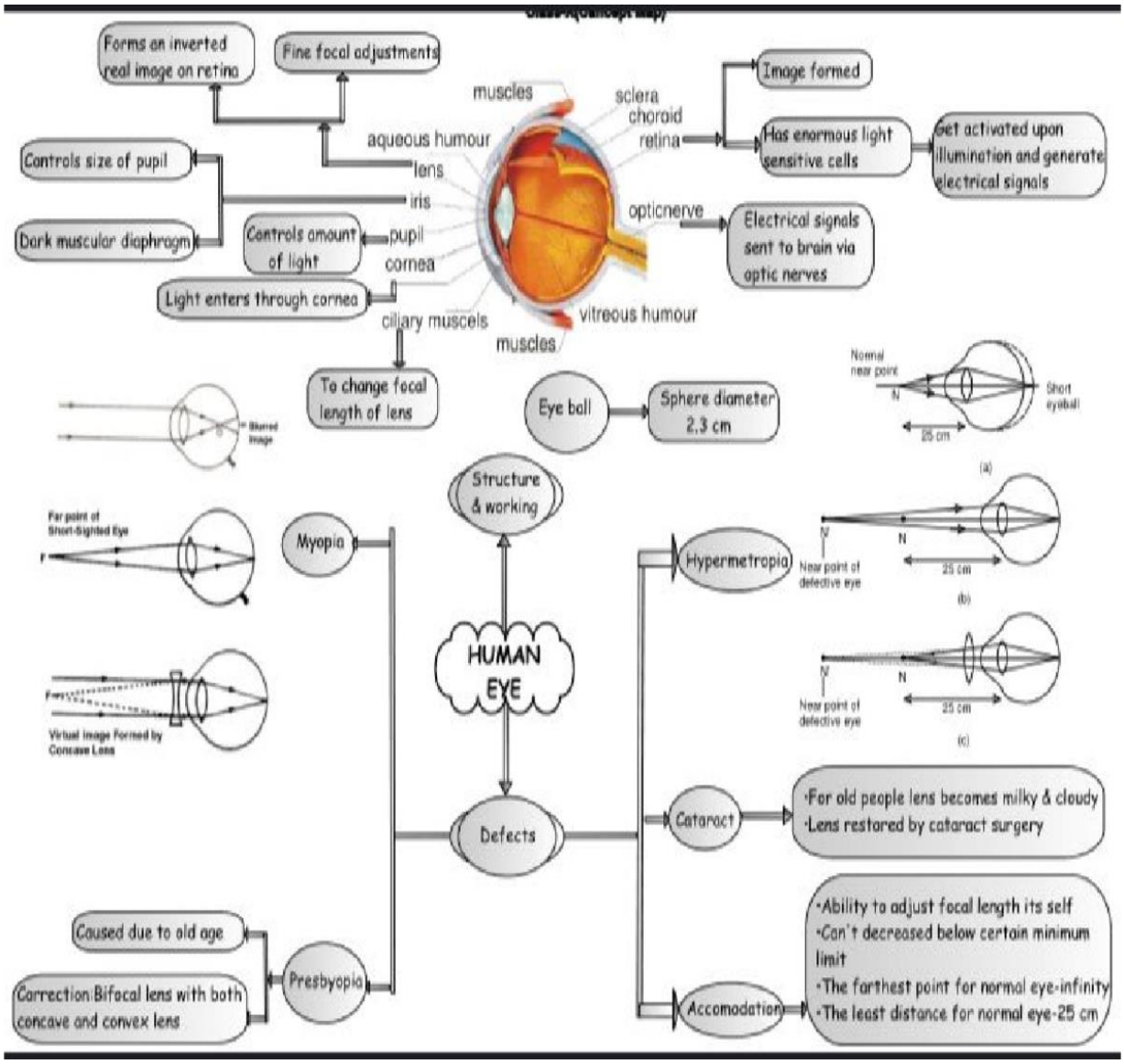
MIND MAP

LIGHT REFLECTION AND REFRACTION



MIND MAP

HUMAN EYE AND THE COLOUR FUL WORLD



NATURAL PHENOMENA

Refraction of light through a glass prism

- A homogeneous, transparent refracting medium bound by atleast two non-parallel surfaces inclined at some angle is called a prism.

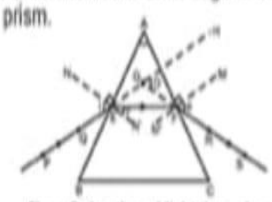
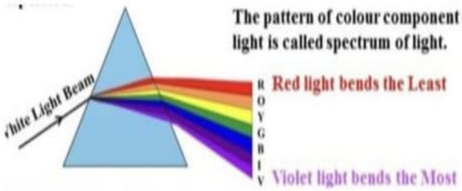


Fig. : Refraction of light through a triangular glass prism

PE - Incident ray
EF - Refracted ray
FS - Emergent ray
∠A - Angle of the prism
∠i - Angle of incidence
∠r - Angle of refraction
∠e - Angle of emergence
∠D - Angle of deviation

Dispersion of Light

- The splitting of white light into its component colours on passing through a transparent medium like a glass prism.
- The white light disperses into its seven colour components in the order VIBGYOR i.e., Violet, Indigo, Blue, Green, Yellow, Orange, Red.
- The red colour has the maximum speed in the prism, so it deviates the least while the violet colour has the minimum speed, so it deviates the most.



The pattern of colour component of light is called spectrum of light.

Atmospheric Refraction

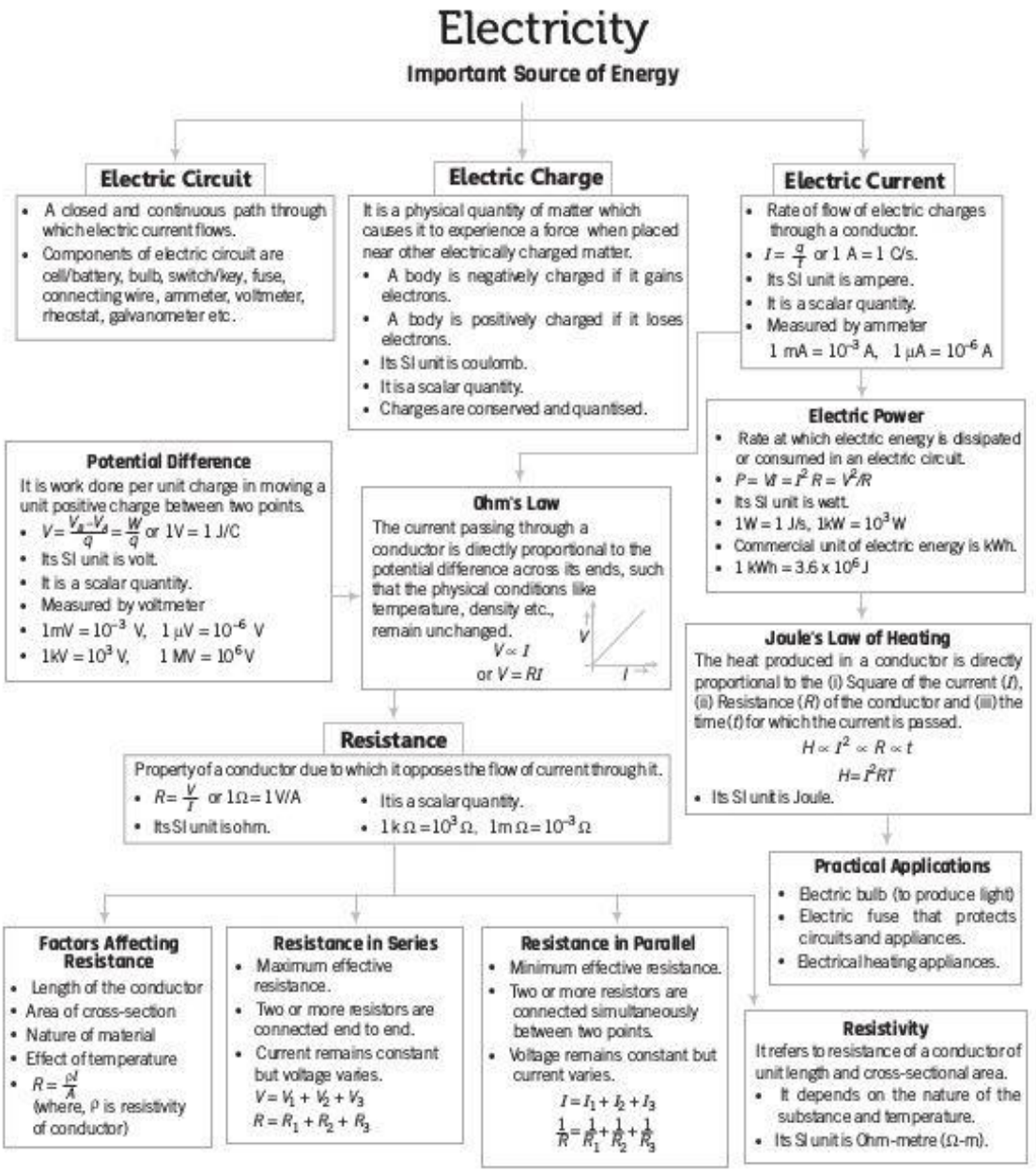
- The refraction of light caused by the earth's atmosphere.
- Some of the phenomena which occur due to atmospheric refraction are:
  - » Twinkling of stars.
  - » The stars seem higher than they actually are.
  - » Advance sunrise and delayed sunset.

Scattering of Light

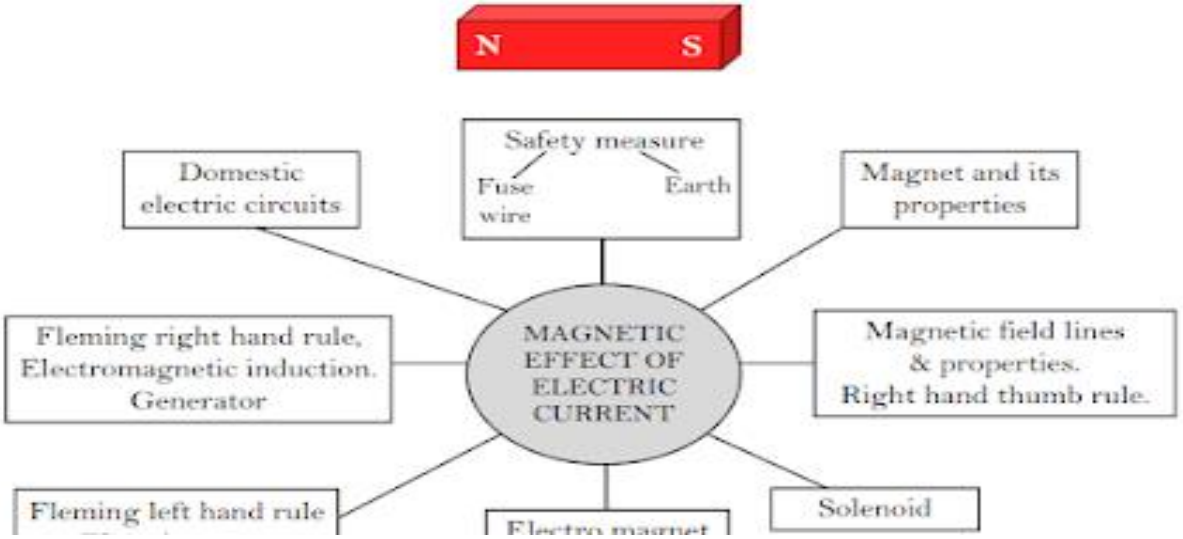
- When sunlight enters the earth's atmosphere, the atoms and molecules of different gases in the atmosphere absorb this light and re-emit it in all directions.
- The scattering of light by particles in its path is called Tyndall effect.
- Some phenomena which occur due to scattering of light are :
  - » The colour of the sky is blue.
  - » The sun appears red at sunrise and sunset.

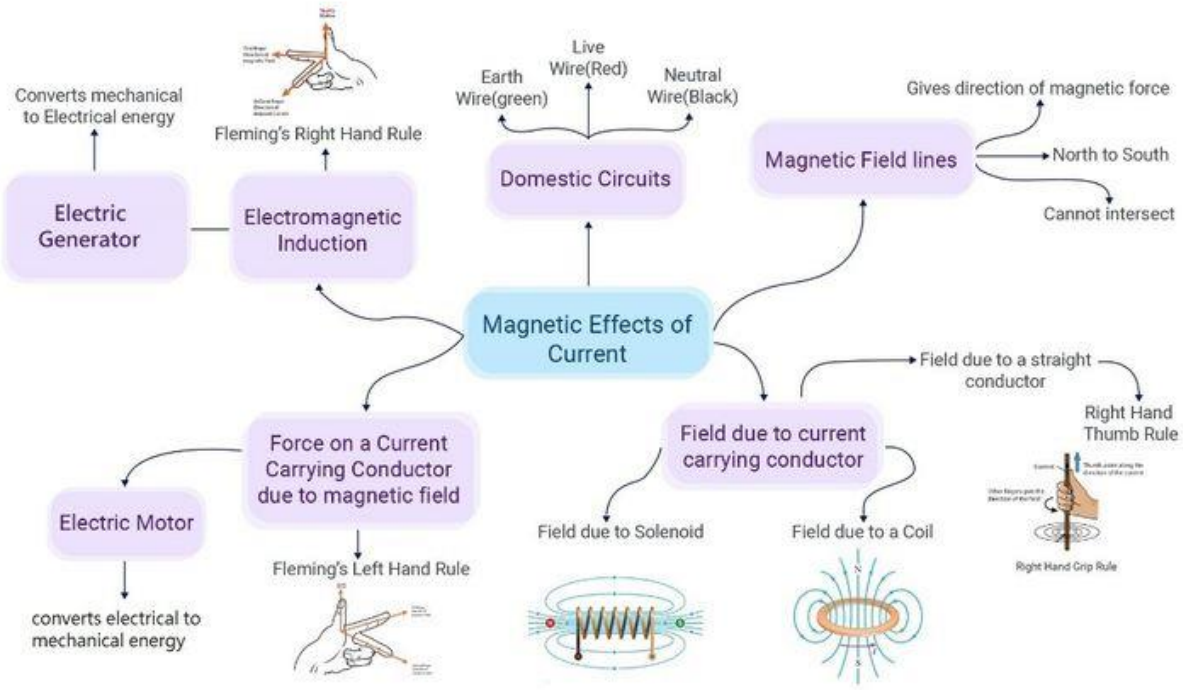
CHAPTER-11-ELECTRICITY-MIND MAP

CHAPTER-11- ELECTRICITY



CHAPTER-12-MAGNETIC EFECT OF CURRENT-MIND MAP





OUR ENVIRONMENT

➤ Structural and functional unit of biosphere comprising living organisms and their non-living environment.

➤ Two basic processes involved in an ecosystem are:

(i) Cycling of material

(ii) Flow of energy

Types

➤ **On the basis of nature**:

(I)Natural ecosystems: Operate in nature, e.g., forest ecosystem.

(ii) Artificial ecosystems: Maintained by man, e.g., croplands.

➤ **On the basis of duration**:

(i) Temporary ecosystems: Short-lived ecosystems, e.g., rainfed pond.

(ii) Permanent ecosystems: Long-lived ecosystems, e.g., lake ecosystem.

➤ **On the basis of size**:

(i) Small ecosystems: Small-sized ecosystems, e.g., pond.

(ii) Large ecosystems: Very large-sized ecosystems, e.g., an ocean.

Components

➤ Two main components are:

(i) Abiotic or non-living components

(ii) Biotic or living components

Biotic

➤ It includes living organisms.

➤ Three main categories are:

(i) Producers: Produce their own food

(ii) Consumers: Obtain food from producers

(iii) Decomposers: Obtain food from organic materials of dead producers and consumers

Abiotic

➤ Non-living physico-chemical factors of the environment.

➤ They can be:

(i) Inorganic substances like carbon, nitrogen, etc., and their compounds.

(ii) Organic compounds like carbohydrates, proteins, etc.

(iii) Climatic factors like light, temperature, etc.

Energy Flow

➤ Energy interactions between organisms in an ecosystem

Food Chain: Sequential interlinking of organisms involving food transfer at different trophic levels.

Food Web: Network formed by interconnected food chains.

Biomagnification: It is the process in which

ENVIRONMENTAL PROBLEM

Disturbance in any component of the environment causes an imbalance. This leads to many environmental problems