

AUTUMN BREAK HOLIDAY HOMEWORK

Class 10

SUBJECT SCIENCE

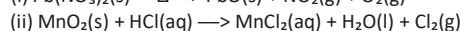
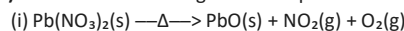
SUBMISSION INSTRUCTIONS

1. Complete all questions systematically in your Science Notebook/Portfolio file. Balanced equations must state physical symbols (s, l, g, aq); all diagrams and ray paths must be drawn with a sharp pencil and labeled neatly.

2. SPECIAL MANDATORY CLAUSE : Students who have NOT yet submitted their **Summer Vacation Holiday Project MUST submit** and this Autumn Break assignment together on the school reopening day. **Internal Assessment portfolio entry (5 Marks) is strictly conditional upon clearing this pending backlog.**

SECTION A: CHEMICAL SUBSTANCES — NATURE & BEHAVIOUR (CHEMISTRY)**Q1. Chemical Reactions & Redox Processes:**

(a) Balance the following skeletal equations and identify the reaction type:



(b) A shiny reddish-brown metal 'X' when heated in air turns into a black compound 'Y'. When hydrogen gas is passed over heated 'Y', it regains 'X'. Identify X and Y. Write both balanced equations and justify why this is a redox reaction.

(c) Review your Half-Yearly answer paper: Identify two specific concepts where you lost marks, and write their corrected, step-by-step solutions.

Q2. Acids, Bases & Salts (Industrial Applications):

(a) Explain the Chlor-Alkali process with a balanced equation. Name the gases liberated at the anode and cathode, stating one major industrial application for each.

(b) Tabulate the Chemical Name, Chemical Formula, Preparation Equation, and two practical uses for: (i) Bleaching Powder, (ii) Plaster of Paris (POP).

(c) Why is Plaster of Paris always stored in moisture-proof, airtight containers? Support your explanation with a balanced chemical equation.

Q3. Metals, Non-Metals & Metallurgy Principles:

(a) Show the formation of Magnesium Chloride (MgCl_2) and Sodium Oxide (Na_2O) through electron-dot structures (transfer of valence electrons).

(b) Differentiate between Calcination and Roasting using balanced chemical equations for Calamine (ZnCO_3) and Zinc Blende (ZnS). Write the reduction equation of ZnO with carbon.

(c) State three general physical properties of ionic compounds. Justify why they have high melting points and conduct electricity in the molten state but not in solid form.

SECTION B: WORLD OF LIVING (BIOLOGY)**Q4. Life Processes — Nutrition & Cellular Respiration:**

(a) Draw a neat, fully labeled diagram of the cross-section of a dicot leaf highlighting chloroplasts, stomatal pore, and guard cells.

(b) Draw the complete schematic flowchart showing the breakdown of glucose into pyruvate followed by three subsequent fates: (i) Aerobic (mitochondria), (ii) Anaerobic in yeast (fermentation), and (iii) Anaerobic in muscle cells (lactic acid build-up).

(c) State the precise site of secretion and digestive function of: (i) Salivary amylase, (ii) Bile juice (emulsification & alkaline medium), and (iii) Trypsin.

Q5. Life Processes — Circulation & Excretion:

(a) Draw a schematic diagram of double circulation in human beings. Explain why structural separation of oxygenated and deoxygenated blood is essential in birds and mammals.

(b) Draw a neat diagram of a Nephron. Label Bowman's capsule, Glomerulus, Henle's loop, and Collecting duct. Explain the two stages of urine formation: ultrafiltration and selective reabsorption.

(c) Why is the breathing rate of aquatic animals significantly faster than that of terrestrial animals? Explain in terms of dissolved oxygen.

Q6. Control & Coordination (Nervous & Chemical):

(a) Trace the sequential transmission pathway of a nerve impulse in a Reflex Arc using a flowchart: Stimulus $\longrightarrow$ Receptor $\longrightarrow$ Sensory Neuron $\longrightarrow$ Relay Neuron $\longrightarrow$ Motor Neuron $\longrightarrow$ Effector $\longrightarrow$ Response.

(b) Tabulate the endocrine gland, hormone secreted, target organ, and primary physiological function for: (i) Thyroid gland, (ii) Pancreas, and (iii) Adrenal Gland.

(c) Differentiate between tropic movements (directional growth) and nastic movements (non-directional turgor changes) with suitable examples (e.g., phototropism vs thigmonasty in *Mimosa pudica*).

SECTION C: NATURAL PHENOMENA & ENVIRONMENT (PHYSICS & ECOLOGY)

Q7. Spherical Mirrors & Reflection of Light:

- (a) Construct neat ray diagrams with a sharp pencil and ruler for a concave mirror when the object is placed: (i) Between Focus (F) and Pole (P), (ii) Between Focus (F) and Centre of Curvature (C). State image nature and position in each case.
- (b) Numerical: An object 4.0 cm high is placed at 25.0 cm in front of a concave mirror of focal length 15.0 cm. Find the image distance (v), size (h'), and nature of the image formed.
- (c) Explain why convex mirrors are universally preferred as rear-view mirrors in automobiles. State two distinct optical justifications.

Q8. Spherical Lenses & Refraction:

- (a) Draw the ray diagram for an object placed between Focus (F_1) and Optical Centre (O) of a convex lens. State the magnification and nature of the image formed.
- (b) Numerical: A concave lens has a focal length of 15 cm. At what distance should the object be placed so that it forms an image at 10 cm from the lens? Determine the magnification.
- (c) A doctor prescribes a corrective lens of power -2.0 D. Calculate its focal length in cm and state whether the lens is converging or diverging.

Q9. Human Eye & Atmospheric Optics:

- (a) Illustrate with neat ray diagrams: (i) A Myopic eye and its correction using a concave lens, (ii) A Hypermetropic eye and its correction using a convex lens.
- (b) Give concise scientific justifications for: (i) Why stars twinkle while planets exhibit steady illumination, (ii) Advance sunrise and delayed sunset by 2 minutes each due to atmospheric refraction.

Q10. Our Environment & Ecosystem Dynamics:

- (a) State Lindeman's 10% Law of Energy Transfer. If 20,000 J of solar energy is absorbed by green plants (producers), calculate the energy available to the tertiary consumer in that food chain.
- (b) Define Biological Magnification (Biomagnification). Explain why the concentration of harmful non-biodegradable pesticides peaks at the highest trophic level.

English Homework for Class X

Question 1: Formal Letter Writing (5 Marks)

Context: You are **Aarav / Ananya**, the Student Editor of the Eco Club at your school. While traveling around your locality during the autumn festival season, you noticed a alarming rise in single-use plastic clutter, unsegregated waste around community pandals, and loud music played late into the night.

Write a letter to the **Editor of a national daily** expressing your concern over the environmental and health impacts of post-festival waste and noise pollution. Suggest two practical, community-driven steps to celebrate festivals sustainably.

Focus Areas:

Formal layout (Sender's Address, Date, Receiver's Address, Subject, Salutation, Body, Sign-off).

Concise statement of the problem and its impact on public health and local hygiene.

Constructive solutions (e.g., eco-friendly decorations, community clean-up drives, strictly enforcing silent hours).

Question 2: Analytical Paragraph (5 Marks)

Context: Study the pie chart below, which summarizes a survey conducted among 500 teenagers (Ages 14–16) regarding their primary reading habits during school vacations:

E-books & Audiobooks: 35%

Social Media Articles / Blogs: 30%

Physical Books (Fiction / Non-fiction): 20%

Comics & Graphic Novels: 10%

No regular reading: 5%

Write an analytical paragraph analyzing the data. Summarize the major trends, compare key preferences, and draw a brief concluding observation about screen-based versus traditional reading habits among youth today.

CLASS X – SOCIAL SCIENCE

1. Practise the prescribed map-work locations on an outline political map of India.

2. Locate and label the places given in your syllabus, textbook and class notebook.

3. Revise the names and locations of all map-work items. Practise each map neatly and clearly.

All the work is to be completed in social science notebook

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SUBJECT : MATHEMATICS

1. Complete Math Portfolio.
2. Complete 8 Math Subject Enrichment Activity .
 - Activity 1: Pair of Linear Equations in Two Variables
 - Activity 2: Arithmetic Progression I
 - Activity 3 : Arithmetic Progression II
 - Activity 4 : BPT
 - Activity 5: Coordinates Geometry
 - Activity 6: Tangent to Circle
 - Activity 7: Tangents to Circle from External Point
 - Activity 8: Surface Area and Volume