

# Einstein

## PUBLIC SCHOOL

Nurturing a better tomorrow

SUMMER VACATION HOLIDAY HOMEWORK-2026

**Class-X**

**Subject-Computer**

### Teacher's Instructions

- Complete all work neatly in a separate notebook/file.
- Use coloured charts, diagrams, and creativity wherever required.
- Practical work should be done sincerely.
- Submit the holiday homework after summer vacation.

### Part A – MCQs (20 Questions)

1. Which of the following is verbal communication?  
a) Smile  
b) Conversation  
c) Gesture  
d) Sign language
2. Which communication method uses facial expressions?  
a) Written communication  
b) Non-verbal communication  
c) Oral communication  
d) Visual communication
3. Which of the following is a barrier to communication?  
a) Noise  
b) Confidence  
c) Listening  
d) Clarity
4. Self-management helps a person to:  
a) Waste time  
b) Achieve goals  
c) Ignore work  
d) Avoid planning

5. Which skill improves confidence?

- a) Laziness
- b) Positive thinking
- c) Anger
- d) Carelessness

6. Which of the following is an example of written communication?

- a) Letter
- b) Telephone call
- c) Gesture
- d) Discussion

7. Which quality is important for effective communication?

- a) Listening
- b) Interrupting
- c) Anger
- d) Ignoring others

8. Which of the following improves self-management?

- a) Time management
- b) Delay in work
- c) Lack of discipline
- d) Carelessness

9. Which of the following is non-verbal communication?

- a) Speech
- b) Debate
- c) Eye contact
- d) Letter writing

10. Stress can be reduced by:

- a) Proper planning
- b) Sleeping late
- c) Ignoring work
- d) Lack of exercise

11. Which communication method is used in classroom teaching?

- a) Oral communication
- b) Visual communication
- c) Written communication
- d) All of these

12. Which of the following is important for teamwork?

- a) Cooperation
- b) Anger
- c) Ego
- d) Negativity

13. Self-awareness means:

- a) Understanding strengths and weaknesses
- b) Ignoring mistakes
- c) Avoiding work
- d) Wasting time

14. Which of the following is a communication skill?

- a) Active listening
- b) Sleeping
- c) Fighting
- d) Shouting

15. Which activity improves time management?

- a) Making a timetable
- b) Watching TV all day
- c) Avoiding studies
- d) Delaying tasks

16. Which of the following is a positive attitude?

- a) Confidence
- b) Fear
- c) Laziness
- d) Anger

17. Which communication method uses symbols and charts?

- a) Visual communication
- b) Oral communication
- c) Written communication
- d) Verbal communication

18. Goal setting helps students to:

- a) Stay focused
- b) Waste time
- c) Avoid work
- d) Ignore studies

19. Which of the following improves self-confidence?

- a) Practice
- b) Fear
- c) Negativity
- d) Carelessness

20. Which of the following is essential for good communication?

- a) Clear message
- b) Confusion
- c) Noise
- d) Anger

**Part B – Competency-Based Questions (5 Questions)**

1. A student is unable to complete homework on time because of poor planning. Suggest two ways to improve time management.
2. Your friend feels nervous while speaking in public. Suggest ways to improve confidence and communication skills.
3. A group project failed because students were not listening to each other. Explain how active listening can improve teamwork.
4. Explain how self-management skills help students achieve success in examinations.
5. Describe how positive body language helps in effective communication.

### **Part C – Case-Based Questions (5 Questions)**

1. Ravi always interrupts others during discussions. Because of this, his classmates avoid working with him.
  - a) Which communication problem is shown here?
  - b) Suggest two ways Ravi can improve his communication skills.
2. Neha spends too much time on mobile games and is unable to complete assignments. a)  
Which self-management skill is lacking?
  - b) Suggest two ways to improve it.
3. A team of students is preparing for a presentation. Some members are not cooperating.
  - a) Why is teamwork important?
  - b) Mention two communication skills needed for teamwork.
4. Aman becomes stressed before every examination.
  - a) What can Aman do to manage stress?
  - b) Mention two healthy habits for stress management.
5. A student forgets important tasks regularly.
  - a) Which skill should the student improve?
  - b) Suggest two practical solutions.

### **Part D – Application-Based Questions (5 Questions)**

1. Prepare a daily timetable for a student who wants to improve time management.
2. Write a short conversation between two students showing effective communication.
3. Explain how communication skills are useful during an interview.
4. Describe how self-management skills help students during examinations.
5. Design a poster on “Positive Communication Skills.”

### **Part A – Objective Questions**

1. What is communication?
2. Name any two methods of communication.
3. What is non-verbal communication?
4. Define self-management.
5. Write any two qualities of a self-managed person.

### **Part B – Short Answer Questions**

1. Differentiate between verbal and non-verbal communication.
2. Explain the importance of communication skills in daily life.

3. Write any three barriers to effective communication.
4. Explain any three self-management skills.
5. Why is time management important for students?
6. Define communication.
7. What is verbal communication?
8. What is non-verbal communication?
9. Mention any two barriers to communication.
10. Define self-management.
11. What is time management?
12. Write any two qualities of a self-confident person.
13. What is active listening?
14. Mention any two advantages of communication skills.
15. Write any two ways to improve self-management skills.

### **Part C – Long Answer Questions**

1. Explain how communication skills help students in school and future careers.
2. Describe different ways to improve self-confidence and self-management skills.
3. A student feels nervous during presentations and fails to complete work on time. Suggest ways to improve communication and self-management skills.
4. Explain the importance of communication skills in daily life and workplace.
5. Differentiate between verbal and non-verbal communication with suitable examples.
6. Describe different methods to improve self-management skills.
7. Explain the importance of time management for students.
8. A student feels shy while speaking in class and cannot complete tasks on time. Explain how communication skills and self-management skills can help the student improve performance and confidence.

### **Activity Work**

1. Prepare a chart on “Methods of Communication.”
2. Make a daily timetable showing proper time management.
3. Write five ways to improve self-confidence.

### **Practical Activities**

#### **Activity 1: Communication Skills**

Prepare a chart showing:

- Types of communication
- Verbal communication
- Non-verbal communication
- Visual communication

## Activity 2: Self-Management Skills

Create a daily timetable for:

- Study time.
- Exercise
- Recreation
- Sleep
- Mobile/Screen time

## Activity 3: ICT Skills

Create:

- One document in MS Word
- One presentation in PowerPoint
- One spreadsheet in Excel

Take screenshots and paste them in your notebook/file.

## Activity 4: AI Project Cycle

Prepare a mini-AI project on any one topic:

- Smart Attendance System
- AI in Healthcare
- AI Chatbot
- AI in Education

Include:

- Problem
- Data Collection
- Solution
- Expected Output

## Creative Homework

1. Make a poster on “Effective Communication Skills”.
2. Write 10 ways to manage stress during exams.
3. Draw and label the AI Project Cycle neatly.
4. Write five real-life applications of Artificial Intelligence.

## Sample Paper

### MCQs & Assertion–Reason Questions (5 × 1 = 5 Marks)

#### Multiple Choice Questions

1. Which of the following is an example of verbal communication?  
a) Smile  
b) Hand gesture  
c) Conversation  
d) Eye contact
2. Which skill helps a person organize work and complete tasks on time?  
a) Self-management  
b) Drawing  
c) Gaming  
d) Painting
3. Which of the following is a barrier to communication?  
a) Active listening  
b) Noise  
c) Confidence  
d) Eye contact

#### Assertion–Reason Questions

4. Assertion (A): Self-discipline is important for success.  
Reason (R): Self-discipline helps a person stay focused on goals.  
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.
5. Assertion (A): Communication skills are important in daily life.  
Reason (R): Good communication helps people express ideas clearly.  
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.

#### Short Answer Type I (Attempt Any 2) (2 × 2 = 4 Marks)

1. Define communication. Mention any two methods of communication.
2. What is self-management?
3. Write any two advantages of effective communication.

#### Short Answer Type II (Attempt Any 2) (2 × 3 = 6 Marks)

1. Differentiate between verbal and non-verbal communication.
2. Explain any three self-management skills.

3. Describe the importance of time management in student life.

**Long Answer Type Question (1 × 5 = 5 Marks)**

**Attempt any one question.**

1. A student feels nervous while speaking in public and is unable to complete homework on time. Explain how communication skills and self-management skills can help the student improve confidence and performance.

OR

2. Read the following case carefully:

A group of students is preparing a classroom presentation. Some students are not listening carefully, while others are not managing their time properly.

Answer the following questions: a) What communication problem is shown in the case?

b) Suggest two ways to improve communication in the group.

c) Mention two self-management skills needed for success.

d) Why is teamwork important in group activities?

**Subject-English**

Chapters Covered:

A Letter to God

Nelson Mandela: Long Walk to Freedom

Fire and Ice

Dust of Snow

A Triumph of Surgery

The Thief's Story

Grammar: Determiners & Tenses

ENGLISH SUMMER VACATION HOLIDAY HOMEWORK

General Instructions

Complete all work neatly in a separate notebook.

Use blue/black pen only.

Draw margins on every page.

Decorate the project with suitable pictures and drawings.

Learn all question answers and grammar rules properly.

## SECTION A – READING COMPREHENSION

### Passage 1

**Read the passage carefully and answer the questions that follow.**

Summer vacations are the most enjoyable time for students. They provide relaxation from studies and help children discover new hobbies and interests. Some students spend their vacations visiting grandparents, while others join hobby classes. Reading books, learning new skills, exercising, and helping parents at home can make vacations productive. Vacations should not be wasted only on mobile phones and television. A balanced routine helps students remain active and refreshed for the new session.

Questions:

Why are summer vacations enjoyable?

Mention two activities students do during vacations.

What should students avoid during vacations?

Find a word from the passage meaning “useful”.

Suggest a suitable title for the passage.

### Passage 2

Nelson Mandela believed that education was the most powerful weapon to change the world. Despite facing imprisonment for many years, he never lost hope. He fought against racial discrimination and worked for equality and justice. His life inspires millions of people across the world to stand against injustice with courage and patience.

Questions:

What did Nelson Mandela believe?

Why was he imprisoned?

What values do we learn from Mandela?

Find the synonym of “fairness”.

Write the central idea of the passage.

## SECTION B – LITERATURE

### CHAPTER: A LETTER TO GOD

#### Very Short Answer Questions

Who was Lencho?

What destroyed Lencho’s crops?

Why did Lencho write a letter to God?

How much money did Lencho ask for?

Who helped Lencho secretly?

#### Short Answer Questions

Why was Lencho called an ox of a man?

How did the postmaster help Lencho?

Why did Lencho call the post office employees “a bunch of crooks”?

What does the story teach us about faith?

Describe the hailstorm in your own words.

#### Long Answer Questions

“Faith can move mountains.” Explain with reference to the story.

Describe Lencho’s character.

Imagine you are the postmaster. Write a diary entry after reading Lencho’s second letter.

### CHAPTER: NELSON MANDELA – LONG WALK TO FREEDOM

#### Very Short Answer Questions

When did South Africa become independent?

Who took the oath with Mandela?

What does courage mean according to Mandela?

What were Mandela's ideals?

Name the two national anthems mentioned in the chapter.

Short Answer Questions

Why were two national anthems sung?

How did apartheid affect black people?

What twin obligations does Mandela mention?

Why did Mandela join the freedom struggle?

Explain Mandela's idea of freedom.

Long Answer Questions

Describe Mandela as a great leader.

What lessons do you learn from Mandela's life?

Imagine you attended Mandela's inauguration ceremony. Describe your experience.

POEM: FIRE AND ICE

Extract-Based Questions

Extract 1

"Some say the world will end in fire

Some say in ice."

Questions:

Name the poem and the poet.

What does "fire" symbolize?

What does "ice" symbolize?

Which literary device is used in "Some say"?

What is the theme of the poem?

Short Answer Questions

What are the two destructive forces mentioned in the poem?

Why does the poet favour fire?

How is ice equally harmful?

Explain the symbolism in the poem.

What message does the poem give?

Long Answer Question

Explain the poem as a powerful comment on human emotions.

POEM: DUST OF SNOW

Very Short Answer Questions

Which bird is mentioned in the poem?

On which tree did the crow sit?

What fell on the poet?

How did the poet feel before the incident?

What changed the poet's mood?

Short Answer Questions

How did nature change the poet's mood?

Explain the importance of the crow and hemlock tree.

What message does the poem convey?

Describe the poet's mood before and after the incident.

Why is the poem inspirational?

Activity

Draw the scene described in the poem and write 5 lines explaining it.

CHAPTER: A TRIUMPH OF SURGERY

Very Short Answer Questions

Who was Tricky?

Why was Tricki ill?

Who was Mrs. Pumphrey?

What treatment did Dr. Herriot give Tricki?

How did Tricki recover?

Short Answer Questions

Why did Dr. Herriot feel worried about Tricki?

Describe Mrs. Pumphrey's nature.

What role did exercise play in Tricki's recovery?

Why is the story humorous?

Explain the title of the chapter.

Long Answer Questions

"Overfeeding can be dangerous." Explain with reference to the story.

Describe the relationship between Mrs. Pumphrey and Tricki.

Imagine you are Dr. Herriot. Write a letter advising pet owners to care for animals properly.

CHAPTER: THE THIEF'S STORY

Very Short Answer Questions

What was the thief's real name?

Who was Anil?

Why did Hari Singh change names frequently?

What did Anil teach Hari Singh?

Why did Hari Singh return?

Short Answer Questions

Describe Anil's character.

Why did Hari Singh hesitate before stealing?

What changed Hari Singh's heart?

Explain the ending of the story.

Why is trust important in human relationships?

Long Answer Questions

Describe Hari Singh's transformation.

"Kindness can reform a person." Explain.

Write a diary entry as Hari Singh after returning to Anil.

### SECTION C – GRAMMAR

#### DETERMINERS

Fill in the blanks with suitable determiners:

\_\_\_\_\_ students were absent today.

I have \_\_\_\_\_ books in my bag.

She drank \_\_\_\_\_ milk left in the glass.

\_\_\_\_\_ boy in the class was excited.

There isn't \_\_\_\_\_ water in the bottle.

I saw \_\_\_\_\_ elephant in the zoo.

He has \_\_\_\_\_ friends in Delhi.

\_\_\_\_\_ apple a day keeps the doctor away.

Can I have \_\_\_\_\_ more piece of cake?

\_\_\_\_\_ of the players performed well.

Choose the correct determiners:

(Much/Many) students attended the function.

There is (little/few) sugar left.

(Each/Every) child received a prize.

She has (some/any) interesting books.

(This/These) mangoes are sweet.

## TENSES

Identify the tense:

She is singing beautifully.

They had completed the work.

I will visit Jaipur next month.

He plays football daily.

We have finished our homework.

Change the tense as directed:

He writes a letter. (Past Continuous)

She was dancing. (Simple Present)

I have completed my work. (Simple Past)

They will play cricket. (Present Continuous)

Rahul ate an apple. (Future Perfect)

Error Correction

She do not like coffee.

They was going to school.

I has completed my homework.

He were playing cricket.

We is happy today.

## SECTION D – WRITING SKILLS

Notice Writing

Write a notice about a tree plantation drive in your school.

Write a notice for inter-house debate competition.

Letter Writing

Write a letter to your friend describing your summer vacation plans.

Write a letter to the principal requesting extra library periods.

Diary Entry

Write a diary entry about your first day of summer vacation.

Write a diary entry after reading "The Thief's Story".

Article Writing

Importance of Discipline

Value of Education

Harmful Effects of Mobile Phones on Students

### **SECTION E – CREATIVE ACTIVITIES**

Project Work

Make a chart on the life of Nelson Mandela.

Draw and decorate scenes from:

A Letter to God

Dust of Snow

Prepare a grammar chart on all types of tenses.

Learn and write 20 new English words with meanings daily.

Read one English newspaper article daily and write its summary.

### **SECTION F – LEARNING TASKS**

Learn and Revise

Learn all textbook question answers.

Revise grammar rules of determiners and tenses.

Practice one page of handwriting daily.

Memorize both poems with proper pronunciation.

**BONUS TASKS**

Speaking Activity

Speak for 2 minutes on:

My Favourite Leader

Importance of Honesty

How I Spent My Summer Vacation

Vocabulary Practice

Write meanings and make sentences of:

Freedom

Courage

Determination

Faith

Honesty

Justice

Sympathy

Generosity

Responsibility

## **Subject-Social Studies**

### **SECTION A: HISTORY**

#### **Chapter 1: The Rise of Nationalism in Europe**

##### **Task 1: The "Nation-State" Investigative Dossier**

Select any **one** European nation that underwent political transformation or unification in the 19th century (e.g., Germany, Italy, or Greece). Construct a detailed investigative profile addressing the following coordinates:

- **The Architect's Blueprint:** Identify the key leader or strategist (e.g., Otto von Bismarck, Giuseppe Garibaldi, Count Cavour) and dissect the specific

administrative or military strategies they deployed.

- **Cultural Weaving:** Evaluate the role of *Romanticism*. Provide concrete evidence of how localized art, poetry, folklore, or music was deliberately leveraged to establish a collective identity and shared heritage.

**Think Like a Historian:** Examine Frédéric Sorrieu's famous 1848 print, '*La République universelle démocratique et sociale*'. If an artist were commissioned to paint an updated version of this vision in the contemporary year **2026**, what global challenges, new institutional symbols, or modern visual metaphors should be included to represent unity? Explain your vision in 100 words.

degradation, optimize water resource management, and outline the precise conservation mechanisms required to maintain ecological equili

## Section-GEOGRAPHY

### Chapter 1: Resources and Development

#### Task 2: Local Resource Audit & Sustainable Action Architecture

Execute a localized "Resource Mapping" matrix within your immediate household or local neighborhood community. Process your findings into two distinct structural parameters:

1. **Classification Matrix:** Document and map assets based on status of utility (Renewable vs. Non-Renewable) and accountability frameworks (Individual vs. Community-owned).
2. **The 2026 Ecological Challenge:** You are appointed as a Sustainable Planning Officer. You have been assigned a hypothetical 10-acre block of semi-arid, degraded land. Formulate an actionable, scientifically sound land-use framework that ensures "Development without Destruction."

Your plan must explicitly detail concrete methods to eliminate soil degradation, optimize water resource management, and outline the precise conservation mechanisms required to maintain ecological equilibrium.

## SECTION C: DEMOCRATIC POLITICS

### Chapter 1: Power Sharing

#### Task 3: Comparative Governance Analysis & Crisis Resolution

Analyze structural governance styles by completing and evaluating the comparative structural layout below:

Analytical Feature	The Belgian Model (Accommodation)	The Sri Lankan Model (Majoritarianism)
<b>Institutional Linguistic Framework</b>	Equal representation of Dutch and French-speaking ministers in the Central Government.	The 1956 Act recognized Sinhala as the sole official language, disregarding Tamil.
<b>Geographical Power Allocation</b>	Devolution of powers to state governments; community government structures; handling cultural/ educational issues.	Highly centralized power structures; state patronage favoring the majority community.
<b>Long-term Socio-Political Outcome</b>	Mitigated ethnic fracture; preserved national integrity and peaceful cohabitation.	Acute alienation of minority population culminating in protracted Civil War.

#### Task 3.2: The Ambassador's Speech

Write a brief, high-impact speech (approx. 150–200 words) to be delivered before a mock peace commission. Assume the persona of a mediator deployed to a diverse nation experiencing civil strife due to ethnic polarizations. Propose a robust **Power Sharing framework** proving that sharing power strengthens national resilience rather than fracturing it

## Interactive Learning Interface: Development Index Simulator

Note: This is an interactive configuration matrix for your project data input. Complete the indicators below to simulate Human Development metrics.

Indicator 1: Life Expectancy at Birth (Range: 40 to 90 Years)



Indicator 2: Combined Educational Metric (Expected & Mean Years of Schooling)



Indicator 3: Gross National Income (GNI) per Capita (PPP \$)

\$ 18,500

Computed Simulation Output Index: **0.748 (HIGH HUMAN DEVELOPMENT)**

## Subject- Science

### Section-A

Chapter: Life Processes

- Instructions
  - Write all answers neatly in a separate notebook/file.
  - Draw labelled diagrams with pencil.
  - Complete the work in your own handwriting.
  - Revise NCERT textbook alongside the homework.
- **Section A – Very Short Answer Questions**

(Answer in 1–2 lines)

1. What are life processes?
2. Define nutrition.
3. Name the mode of nutrition in green plants.

4. What is photosynthesis?
5. Name the pigment required for photosynthesis.
6. What is the function of stomata?
7. Define respiration.
8. Differentiate between aerobic and anaerobic respiration.
9. What is transportation in plants?
10. Name the blood vessel that carries oxygenated blood.

➤ **Section B – Short Answer Questions**

(Answer in 30–50 words)

- I. Explain the process of photosynthesis.
- II. Why is digestion necessary in human beings?
- III. Explain the role of saliva in digestion.
- IV. Write the functions of xylem and phloem.
- V. How does exchange of gases occur in human lungs?
- VI. Differentiate between arteries and veins.
- VII. Explain double circulation in humans.
- VIII. What is transpiration? Write its importance.

➤ **Section C – Long Answer Questions**

- A. Describe the human digestive system with a labelled diagram.
- B. Explain the process of respiration in human beings.
- C. Describe transportation of water and minerals in plants.
- D. Explain the structure and working of the human heart with diagram.

➤ **Section D – Diagram Practice**

- a) Draw and label the following diagrams
- b) Human digestive system
- c) Human heart
- d) Human respiratory system

Structure of nephron

- a) Open and closed stomata

➤ **Section E – MCQs**

1) The process by which green plants make food is called:

- |                |                   |
|----------------|-------------------|
| a) Respiration | b) Photosynthesis |
| c) Digestion   | d) Transpiration  |

2) Blood is pumped by the:

- |           |          |
|-----------|----------|
| a) Kidney | b) Brain |
|-----------|----------|

c) Heart

d) Lungs

3) Xylem transports:

a) Food

b) Water and minerals

c) Oxygen

d) Hormones

4) The functional unit of kidney is:

a) Neuron

b) Nephron

c) Alveoli

d) Villi

5) Anaerobic respiration occurs in:

a) Presence of oxygen

b) Absence of oxygen

c) Only plants

d) Only animals

➤ **Section F – Activity Work**

Activity 1: Test for Starch in Leaf

Take a green leaf.

Perform iodine test.

Write observation and conclusion.

**Section G – Project Work**

Prepare a colourful chart/model on any one topic:

Human Heart

Digestive System

Photosynthesis

Respiratory System

Blood Circulation

➤ Learn and write the chemical equation of photosynthesis:

➤ The equation of aerobic respiration:

## Section-B

### Chapter 1: Chemical Reactions and Equations

#### General Instructions

- 1 Read NCERT Chapter 1 carefully before attempting the assignment.
- 2 Write all answers neatly in your notebook.
- 3 Balance all chemical equations properly.
- 4 Attempt all questions.
- 5 Draw neat diagrams wherever required.

#### Very Short Answer Questions

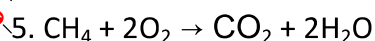
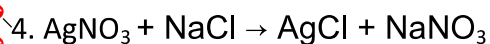
1. Define a chemical reaction.
2. What is a balanced chemical equation?
3. Write one example of a decomposition reaction.
4. What happens when magnesium ribbon is burnt in air?
5. Define oxidation and reduction.

#### Balance the Following Equations

1.  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
2.  $\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_3\text{O}_4$
3.  $\text{Al} + \text{HCl} \rightarrow \text{AlCl}_3 + \text{H}_2$
4.  $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$
5.  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$

#### Identify the Type of Reaction

1.  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
2.  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
3.  $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$



### HOTS / Competency Based Questions

1. Why should a magnesium ribbon be cleaned before burning?
2. Why are decomposition reactions called the opposite of combination reactions?
3. A student observed bubbles when zinc was added to dilute HCl. Name the gas evolved and write the balanced equation.
4. Why do iron articles get rusted faster in coastal areas?
5. Explain why respiration is considered an exothermic reaction.

### Creative Activity

Prepare a colourful chart showing different types of chemical reactions with one example each:

Combination,

Decomposition, Displacement, Double Displacement, and Redox Reaction.

### Section-C

Holiday Homework for Class 10 Science (Physics), covering Chapter: Light – Reflection and Refraction up to Refractive Index.

Section A: Multiple Choice Questions (Competency: Concept Application)

1. A student observes a blurred image of a distant tree in a pond. The real tree is above water, but its image appears inverted. This happens because:
  - (a) Water acts as a plane mirror
  - (b) The water surface causes total internal reflection
  - (c) The water surface behaves like a convex mirror
  - (d) Light rays bend at the air-water interface before reflecting from the bottom
2. If the refractive index of diamond is 2.42 and that of glass is 1.5, then the speed of light is:
  - (a) Faster in diamond than in glass
  - (b) Faster in glass than in diamond
  - (c) Same in both
  - (d) Zero in diamond

3. A coin placed at the bottom of a beaker appears to rise when water is poured into the beaker. This is due to:

- (a) Reflection
- (b) Refraction and apparent depth
- (c) Dispersion
- (d) Scattering

**Section B: Assertion-Reason Based Questions (Competency: Analytical Thinking)**

Instructions: Choose the correct option:

- (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): A concave mirror is used as a shaving mirror.

Reason (R): When the face is placed between the pole and focus, a virtual, erect, and magnified image is formed.

5. Assertion (A): The refractive index of water with respect to air is  $\frac{4}{3}$ .

Reason (R): Refractive index = Speed of light in air / Speed of light in water.

**Section C: Case Study Based Question (Competency: Interpretation & Problem Solving)**

**Case Study – Mirage on a Hot Day**

On a hot summer day, a driver sees a water-like reflection on the road ahead. This is due to refraction of light in air layers of different temperatures. The air near the road is hot (less dense, lower refractive index) and air above is cooler (denser, higher refractive index). Light from the sky bends gradually as it passes through these layers.

- 6. (a) Name the phenomenon responsible for the mirage.
- 6. (b) Why does light bend when it moves from cooler air to hotter air?
- 6. (c) If the refractive index of hot air is 1.00025 and cool air is 1.00029, in which medium is the speed of light higher? Calculate the ratio of speeds.

**Section D:**

**Numerical / Application Based Questions (Competency: Calculation & Real-life Use)**

7. A transparent medium A has refractive index 1.33, and medium B has refractive index 1.5.

- (a) In which medium does light travel faster?

(b) If the speed of light in air is  $3 \times 10^8$  m/s, find the speed in medium A.

(c) What is the refractive index of medium B with respect to medium A?

8. A student places a pencil in a glass of water. From the side, the pencil appears bent at the water surface. Draw a ray diagram to explain why this happens. Label the incident ray, refracted ray, and normal.

#### Section E: Experimental / Competency Based (Thinking & Error Analysis)

9. In an experiment to find the refractive index of a glass slab, a student measured the angle of incidence as  $45^\circ$  and angle of refraction as  $28^\circ$ .

(a) Calculate the refractive index of glass. ( $\sin 45^\circ = 0.707$ ,  $\sin 28^\circ = 0.469$ )

(b) The actual refractive index of glass is 1.5. What could be the possible error in the student's reading?

(c) Suggest one precaution to improve accuracy.

#### 10. Project for Summer Vacation (Competency: Creativity & Real-world connection)

Observe a concave mirror (e.g., in a flashlight, telescope, or makeup mirror) and a convex mirror (e.g., in vehicle side mirrors or a security mirror). Write a short report (1 page) including:

· Where you found each mirror.

· The nature, size, and position of the image you see when you stand close vs. far.

· Why that mirror is used in that place.

#### 1. Fill in the Blanks

1. The refractive index of a medium is the ratio of the speed of light in \_\_\_\_\_ to the speed of light in the medium.

2. The absolute refractive index of air is approximately \_\_\_\_\_.

3. If the refractive index of water is  $\frac{4}{3}$ , then the speed of light in water is \_\_\_\_\_ m/s (given speed of light in vacuum =  $3 \times 10^8$  m/s).

4. When light travels from a rarer to a denser medium, it bends \_\_\_\_\_ the normal.

5. The refractive index of diamond is about 2.42. This means light travels \_\_\_\_\_ times slower in diamond than in vacuum.

#### 2. True or False

1. Higher refractive index means light travels faster in that medium.

2. Refractive index has no units.
3. The refractive index of water is less than that of glass.
4. When light enters from water to glass, it speeds up.
5. The absolute refractive index of a medium can be less than 1.

3. Match the Following

Column A (Medium)	Column B (Refractive Index)
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- |            |         |
|------------|---------|
| 1. Air     | a. 2.42 |
| 2. Water.  | b. 1.50 |
| 3. Glass   | c. 1.33 |
| 4. Diamond | d. 1.00 |

4. Numerical Problems (3 marks each)

1. Speed of light in vacuum =  $3 \times 10^8$  m/s. If the refractive index of glass is 1.5, calculate:
  - a) Speed of light in glass
  - b) Speed of light in water (refractive index of water =  $4/3$ )
2. The refractive index of a medium is  $\sqrt{2}$ . If the angle of incidence in air is  $45^\circ$ , find the angle of refraction.
3. Light enters from air into a medium of refractive index 1.6. If the angle of incidence is  $30^\circ$ , find the angle of refraction. (Use  $\sin 30^\circ = 0.5$ ,  $\sin 18.2^\circ \approx 0.3125$ )
4. A transparent substance has a refractive index of 1.25. Calculate the speed of light in it. ( $c = 3 \times 10^8$  m/s)
5. The refractive index of water with respect to air is  $4/3$ . If the speed of light in air is  $3 \times 10^8$  m/s, what is the speed of light in water?

5. Short Answer Questions

1. Define absolute refractive index.
2. Why does a pencil appear bent when partially dipped in water?
3. What is Snell's law? Write its formula.
4. How does the refractive index depend on the wavelength of light?

5. If the refractive index of water is 1.33 and that of glass is 1.5, in which medium does light travel faster? Why?

6. Higher Order Thinking (HOT)

1. A coin is placed at the bottom of a beaker filled with water to a height of 20 cm. The refractive index of water is  $\frac{4}{3}$ . Find the apparent depth of the coin.

2. Why does a diamond sparkle more than a glass piece? (Hint: Critical angle and refractive index)

3. Two media A and B have refractive indices 1.3 and 1.6 respectively. In which medium does light travel faster? If a ray of light passes from A to B at an incident angle of  $60^\circ$ , will it bend toward or away from the normal?

## Subject- Hindi

प्रश्न-1- 'नेताजी की चश्मा' 'बालगोबिन भगत', 'सूर के पद', तथा राम-लक्ष्मण परशुराम संवाद पाठों का पुनरावृत्ति कीजिए।

प्रश्न .2- कृतिका से 'माता का अंचल' पाठ का सारांश लिखिए।

प्रश्न3-बिजली मीटर बदलवाने के लिए वरिष्ठ अभियंता विद्युत विभाग,पानीपत को पत्र लिखिए।

प्रश्न- 4 अपने जीवन के लक्ष्य को अपनी सोच से चार्ट पर चित्रित करें।

प्रश्न5- मिलावटी सामान की बिक्री की शिकायत करते हुए जिलाधिकारी को ई मेल लिखिए।

प्रश्न- 6“रचना के आधार पर वाक्य भेद” को उदाहरण सहित परिभाषा एक चार्ट पर सुंदर शब्दों में अंकित कीजिये।

प्रश्न-7-कृत्रिम बुद्धिमत्ता विषय पर एक अनुच्छेद लिखिए।

प्रश्न-8नारी सशक्तिकरण विषय पर एक विज्ञापन तैयार कीजिए।

प्रश्न- 9. सरल वाक्य, संयुक्त वाक्य, मिश्र वाक्यों की परिभाषा, 20-20 उदाहरण सहित चार्ट पेपर लिखिए।

प्रश्न-10 "राम-लक्ष्मण परशुराम संवाद' पाठ के सारांश लिखिए।

प्रश्न-11 उपवाक्य तथा आश्रित उपवाक्य के भेद, परिभाषा 20-20 उदाहरण सहित चार्ट पेपर पर लिखिए।

## SUBJECTS: MATHEMATICS (041)

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### General Instructions for Students

- Complete all the homework neatly in Homework notebook.
- Show all the steps and calculations clearly for Mathematics problems.
- Use a pencil for diagrams and graphs wherever required.
- Revise the related concepts before attempting the questions.
- Submit the homework on time after the vacation.

1. Express each number as a product of its prime factors:  
(i) 10395          (ii) 39204          (iii) 27000          (iv) 4199          (v) 5005
2. Given that  $\text{HCF}(420, 525) = 21$ , find  $(420, 525)$ .
3. Show that  $\sqrt{2}$  is an irrational number.
4. Show that  $\sqrt{5}$  is an irrational number.
5. Prove that  $4 + 3\sqrt{5}$  is irrational.
6. Prove that the product of three consecutive positive integers is divisible by 6.
7. There is a circular path around a field car A takes 1 hour 20 minutes to complete one round while car B takes 2 hours to complete the same if they both cars start at same time and move in same direction after how much time will they meet again at the starting point.
8. Find the smallest number which when divided by 45 and 189 leaves the remainder 12 in each case.
9. Find the largest number which divides 82 and 150 leaving remainder 5 and 7 respectively.
10. Two numbers are in ratio 5:8 and their LCM is 240. Find the numbers and explain the reasoning.
11. Three alarm clocks ring their alarms at regular interval of 15 min, 35 min and 45 min respectively. If the first beep together at 6 AM at what time will they beep again for the first time?
12. Check whether  $12^n$  can end with the Zero for any natural number  $n$ .
13. Two numbers are in the ratio 7 : 11 if their HCF is 9 then find their LCM.
14. For each of the following, find a quadratic polynomial whose sum and product respectively of the zeros are as given.  
i)  $-5, 7$           ii)  $-\sqrt{2}, -1$           iii)  $-\frac{1}{2}, 7$
15. Find the zeros of the polynomial  $x^2 + \frac{1}{6}x - 2$ , and verify the relation between the coefficient and zeros of the polynomial.

16. Find the zeros of the polynomial  $6x^2 + x - 2$ , and verify the relation between the coefficient and zeros of the polynomial.
17. Construct a quadratic polynomial whose zeros are reciprocals of the zeros of  $x^2 - 5x + 6$ .
18. Construct a quadratic polynomial whose zeros differ by 4 and sum is 6.
19. If  $\alpha$  and  $\beta$  are the zeros of quadratic polynomial  $x^2 - 5x + 3$ , then find the values of :
- |  |                          |  |
|--|--------------------------|--|
| (i) $\alpha^3 + \beta^3$                           | (ii) $\alpha - \beta$    | (iii) $\frac{1}{\alpha} - \frac{1}{\beta}$ |
| (iv) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ | (v) $\alpha^2 + \beta^2$ | (vi) $\alpha^2 - \beta^2$                  |
20. Find the zeros of each of the following quadratic polynomials and verify the relationship between the zeros and their coefficients:
- |   |                      |
|---|----------------------|
| i) $5x^2 - 4 - x$                       | ii) $z^2 - 14z + 48$ |
| iii) $y^2 - \frac{1}{3}y - \frac{2}{3}$ | iv) $3t^2 - 2t - 8$  |
21. If the sum of the zeros of the quadratic polynomial  $kt^2 - 7t + 3k$  is equal to their product, find the value of k
22. Without plotting, determine whether the lines  $2x + 3y = 6$  and  $4x + 6y = 12$  will intersect, be parallel, or coincide. Explain.
23. Solve the following system of linear equations  $7x - 2y = 5$  and  $8x + 7y = 15$  and verify your answer.
24. The sum of present ages of two persons is 60. Five years ago, the elder was 3 times the younger. Find their ages and check if condition holds after 10 years.
25. A shopkeeper sells pens and pencils. Total items sold are 80 and total money earned is ₹200. Form linear equations if a pen costs ₹3 more than a pencil.
26. A fraction is equal  $\frac{4}{5}$  when 1 is added to both numerator and denominator and equal  $\frac{1}{2}$  when 2 is added to denominator. Find the fraction.
27. Two numbers are in ratio 3:5. If 4 is added to both numbers, the ratio becomes 1:2. Form equations and explain why ratio changes lead to linear equations.
28. A father is 3 times as old as his son. After 12 years, he will be twice as old. Form equations and explain why time shift changes relationships.
29. The numerator of a fraction is 3 less than the denominator. If both are increased by 5, the fraction becomes  $\frac{4}{5}$ . Find the fraction.
30. A fraction becomes 1 when numerator and denominator are increased by 1. If numerator is doubled and denominator is increased by 3, it becomes  $\frac{3}{2}$ . Find the fraction.