SARASWATI WORLD SCHOOL
SESSION 2026-27
HOLIDAYS' HOMEWORK
CLASS 12 CBSE

PHYSICAL EDUCATION

Fitness Activity
Perform any physical activity daily for at least 30 minutes such as:

- Running
- Yoga
- Skipping
- Cycling
- Walking

Maintain a 15-day fitness record mentioning:

- Activity performed
- Time duration
- Benefits felt after exercise

Yoga Activity
Practice any 5 yoga asanas and write:

- Steps of performing
- Benefits
- Precautions

You may include:

- Tadasana
- Bhujangasana
- Vrikshasana
- Padmasana
- Trikonasana

Sports Project

Prepare a short project on any ONE game/sport of your choice.

Include:

- History of the game
- Basic rules
- Required equipment
- Famous players

You may choose games like:

- Cricket
- Football
- Volleyball
- Basket

BIOLOGY (UP+CBSE):-

1) Prepare notes of the following chapters in fair Notebook with well labelled diagrams:
Ch-1 Sexual reproduction in flowering plants,
Ch-2 Human reproduction,
Ch-3 Reproductive Health,
Ch-9 Biotechnology: Principles and Processes,
Ch-10 Biotechnology and its applications.

2) Prepare and learn Table of all the bacterial, fungal, viral and protozoan diseases along with their Causative Agents, Symptoms and their modes of transmission given in the ch-7 Human Health and diseases.

3) Prepare a PROJECT FILE on any of the topic from your NCERT Textbook of biology and you have complete knowledge about that topic.(Only for CBSE students)

4) Prepare a CHART on any topic from your NCERT Textbook of biology and you have complete knowledge about that topic. (Only for UP board Students)

MATHEMATICS

Chapter-wise Practice

Relations and Functions

- Solve 10 questions based on:
  - Types of relations
  - Types of functions
  - Domain and Range

Inverse Trigonometric Functions

- Learn all principal value branches.
- Solve 15 questions based on:
  - Standard values
  - Simplification
  - Properties of inverse trigonometric functions

Matrices

- Practice:
  - Addition and subtraction
  - Multiplication of matrices
  - Transpose of matrices

Solve 15 questions

Formula Work

Prepare a separate formula sheet for all chapters taught so far.

Activity

Write any 5 real-life applications of matrices or trigonometry in daily life.

हिंदी (यू पी)

1. प्रतिदिन एक सुलेख सुंदर व स्पष्ट लिखें।
2. वासुदेव शरण अग्रवाल व रामधारी सिंह दिनकर जी की जीवनी a4 सीट पर लिखे हुए याद करें।
3. खून का रिश्ता व पंचलाइट कहानी का सारांश अपने शब्दों में लिखें
4. महामना मालवीय पाठ का संस्कृत से हिंदी में अनुवाद लिखे व याद करें।
5. श्रवण कुमार का चरित्र चित्रण लिखा वह याद करें
6. अपनी पाठ्यपुस्तक के कोई पांच श्लोक कंठस्थ याद करें वह चार्ट पेपर पर लिखें।

ENGLISH

PROJECT WORK

10. English Investigatory Project

Prepare a project file (20–25 pages) on **any one topic**:

- Impact of Social Media on Youth
- Role of English as a Global Language
- Women Empowerment in Modern India
- Environmental Conservation
- Artificial Intelligence and Future Careers

Project should include:

- Cover Page
- Certificate
- Acknowledgement
- Index
- Introduction
- Survey (minimum 20 respondents)
- Data Analysis (tables/charts)
- Findings
- Conclusion
- Bibliography

Prepare Notes

1. **The Third Level**
2. **The Tiger King**
3. **Journey to the End of the Earth**
4. **The Enemy**
5. **On the Face of It**

Write:

- **Summary**
- **Character Sketches**

ECONOMICS

* Prepare board practical file
* Do 50 numerical of national income

Business studies

* Prepare board practical file

Accounts

Project Work

One specific project based on financial statement analysis of a company covering any two aspects from the

following:

1. Comparative and common size financial statements
2. Accounting Ratio
3. Segment Reports
4. Cash Flow Statements

Topic 1& 2 (roll no. 1 to 6)
Topic 2 & 4 (roll no. 7 to 12)
Topic 1 & 4 (roll no. 13 to 18

Class 12 Chemistry Holiday Homework

Topic: Solutions (विलयन) | Total Marks: 80

Section A: Objective & Very Short Answer — 10 Marks

1. **Define Molality (m):** Why is it preferred over Molarity (M) for temperature-dependent studies? (2)

2. **State Henry's Law:** Mention one application related to deep-sea diving. (2)

3. **Azeotropes:** What are maximum boiling azeotropes? Give one example. (2)

4. **Isotonic Solutions:** What happens to a red blood cell when placed in a hypertonic solution? (2)

5. **Van't Hoff Factor (i):** What is the value of *i* for K_2SO_4 assuming complete dissociation? (2)

Section B: Short Answer Type I — 15 Marks

1. **Raoult's Law:** State the law for a solution containing volatile liquids. How does it differ from Henry's Law? (5)

2. **Ideal vs. Non-Ideal:** Differentiate between Ideal solutions and Non-Ideal solutions showing positive deviation using ΔH_{mix} and ΔV_{mix}. (5)

3. **Solubility:** Discuss the effect of temperature on the solubility of a solid in a liquid according to Le Chatelier's Principle. (5)

Section C: Short Answer Type II - Numericals — 20 Marks

1. **Vapour Pressure:** The vapour pressure of pure water at 298 K is 23.8 mm Hg. 50 g of urea (NH_2CONH_2) is dissolved in 850 g of water. Calculate the vapour pressure of water for this solution and its relative lowering. (7)

2. **Boiling Point Elevation:** A solution of 12.5 g of a non-electrolyte substance in 170 g of water gave a boiling point elevation of 0.63 K. Calculate the molar mass of the substance. (K_b for water = 0.52 K kg/mol). (7)

3. **Molarity/Mass %:** Calculate the molarity of a solution of ethanol in water, in which the mole fraction of ethanol is 0.040 (assume the density of water to be one). (6)

Section D: Long Answer & Case Study — 25 Marks

1. Colligative Properties (10)

- Define Osmotic Pressure.
- Derive the relationship between osmotic pressure and molar mass of a solute.
- Explain why Colligative properties are used to determine the molar mass of polymers.

2. Freezing Point Depression (10)

- Explain why the freezing point of a solvent decreases when a non-volatile solute is added.
- What is the significance of the cryoscopic constant (K_f)?
- Why is salt spread on icy roads in cold countries?

3. Abnormal Molar Mass (5)

Explain why the molar mass of Ethanoic acid determined by freezing point depression in benzene is double its actual molar mass. Write the chemical equation for the association.

Section E: Practical & Project Work — 10 Marks

Lab Report: Write the procedure to prepare a 0.1 M standard solution of Oxalic Acid in a 250ml volumetric flask. Include the calculation for the mass required. (5)

Investigatory Idea: "Study the diffusion of solids in liquids." Briefly outline how temperature affects the rate of diffusion using Potassium Permanganate ($KMnO_4$) and water. (5)

Note: Show all units and balanced chemical equations where applicable. Neatness and accuracy carry weight.

SENIOR SECONDARY SCHOOL

Summer Holiday Homework

Class XII • Physics (Chapter 1: Electric Charges and Fields)

General Instructions:

Complete all tasks neatly in your Physics Assignment Notebook. Show clear step-by-step logic for all derivations and full mathematical working including relevant formula, SI units, and final statements for all numerical problems.

Part A: Core Derivations & Theoretical Framework

1. **Coulomb's Law:** State Coulomb's Law of electrostatics. Write its vector mathematical expression and clearly explain the physical significance of the permittivity of free space (ε_0).
2. **Electric Field Topology:** Sketch clean and accurate electric field lines indicating the direction and relative density for the following configurations:
   - An isolated individual positive charge ($q > 0$)
   - An isolated individual negative charge ($q < 0$)
   - An electric dipole (two equal and opposite point charges separated by distance $2a$)
   - Two identical, mutually repelling positive point charges
3. **Axial Field Profile:** Derive an expression for the net electric field intensity at any point located on the **axial line** of an electric dipole.
4. **Equatorial Field Profile:** Derive an expression for the net electric field intensity at any point located on the **equatorial line** of an electric dipole. Deduce the exact mathematical ratio of E_{axial} to $E_{equatorial}$ for a short dipole ($r >> a$) at an identical distance.
5. **Dipole Dynamics:** Derive an analytic expression for the mechanical torque (τ) exerted on an electric dipole placed uniformly inside an external electric field. Identify the specific configurations that result in maximum torque, stable equilibrium, and unstable equilibrium.
6. **Gauss's Theorem Applications:** State Gauss's Theorem in electrostatics. Using this law, establish expressions for the electric field intensity due to:
   - An infinitely long, perfectly straight, uniformly charged wire with linear charge density λ.
   - An infinite, thin, non-conducting plane sheet with a uniform surface charge density σ.

Part B: Conceptual Analysis & Quantitative Problems

Conceptual Questions

1. Explain rigorously why two distinct electric field lines can never intersect each other under any electrostatic configuration.
2. A plastic comb run through dry hair readily attracts small, uncharged bits of paper. Explain the underlying physical mechanism. What happens if the hair is wet or damp, and why?
3. If the net integrated electric flux through a completely closed Gaussian surface is zero, can we definitively conclude that the net enclosed charge inside is zero? Can we conclude that the electric field strength is zero everywhere across that surface? Provide technical justification.

Numerical Problems

1. **Electrostatic Force Revaluation:** Two point charges $q_1 = +2\ \mu C$ and $q_2 = +6\ \mu C$ repel each other with an initial mutual force of $12\ N$. If an additional charge of $-4\ \mu C$ is introduced and added to each of the two charges while maintaining their original separation distance, calculate the magnitude and nature of the new electrostatic force.
2. **Kinematics in Uniform Fields:** An electron released from rest falls vertically through a distance of $1.5\ cm$ within a uniform downward-directed electric field of magnitude $2.0 \times 10^4\ N/C$. Compute the precise time of fall.

   (Take $m_e = 9.1 \times 10^{-31}\ kg$ and elementary charge $e = 1.6 \times 10^{-19}\ C$)
3. **Dipole Torque Quantification:** An electric dipole with an intrinsic dipole moment of $4 \times 10^{-9}\ C \cdot m$ is aligned at an angle of $30°$ relative to the vector direction of a uniform external electric field of magnitude $5 \times 10^4\ N/C$. Determine the magnitude of the torque acting on the system.
4. **Flux Evaluation (Gauss's Variant):** A point charge of $+10\ \mu C$ is suspended at a fixed height of $5\ cm$ directly above the geometric center of a flat, horizontal square surface of side length $10\ cm$. Compute the magnitude of the electric flux passing directly through this square sheet.

   Hint: *Imagine the square surface as one of the six faces composing a symmetric closed cube.*

Part C: Project-Based & Practical Engagement

Select and complete **one** of the following practical alternatives:

- **Option 1: Investigatory Research Project Report**
  Draft a comprehensive formal project report (4–5 pages) exploring the principles of **Electrostatic Shielding & Faraday Cages**. The report structure must feature an objective, historical background, core mathematical/physical principle, practical experiment overview, and critical modern applications (e.g., aerospace safety during lightning, laboratory coaxial shielding).

- **Option 2: Advanced Concept Visualization Chart**
  Construct a comprehensive, multi-colored mind map/concept blueprint on an A3-sized sheet mapping Chapter 1. The layout must logically bridge: *Methods of Charging → Coulomb's Law → Field Intensity Vector → Dipole Mechanics → Flux Integration → Gauss's Theorem Boundaries*.

Quick-Reference Formula Blueprint

Core Physical Concept	Mathematical Equation / Relation
Quantization of Electric Charge	$q = \pm ne$
Coulomb's Law (Vacuum/Air)	$F = \frac{1}{4\pi\varepsilon_0} \cdot (q_1 q_2 / r^2)$
Electric Field Intensity Vector	$E = F / q_0$
Electric Dipole Moment Vector	$p = q \times (2a)$
Torque Vector on an Electric Dipole	$\tau = pE \sin\theta$ (or $\vec{\tau} = \vec{p} \times \vec{E}$)
Electric Flux Formulation	$\Phi = \oint \vec{E} \cdot d\vec{A} = E A \cos\theta$
Gauss's Fundamental Equation	$\Phi = q_{enclosed} / \varepsilon_0$