

TAGORE SENIOR SECONDARY SCHOOL, BARWA
CLASS XII SCIENCE – SUMMER HOLIDAY HOMEWORK (2025)

Subject	Homework Description	Submission Format
Physics	<p>1.Question: A $500 \mu\text{C}$ charge is at the centre of a square of side 10 cm. Find the work done in moving a charge of $10 \mu\text{C}$ between two diagonally opposite points on the square.</p> <p>2.Question: What is the electrostatic potential due to an electric dipole at an equatorial point?</p> <p>3.Question: What is the work done in moving a test charge q through a distance of 1 cm along the equatorial axis of an electric dipole?</p> <p>4.Question: Why must the electrostatic potential inside a hollow charged conductor be the same at every point?</p> <p>5.Question: What is the geometrical shape of equipotential surfaces due to a single isolated charge?</p> <p>6.Question: Two charges $2\mu\text{C}$ and $-2\mu\text{C}$ are placed at points A and B 5 cm apart. Depict an equipotential surface of the system.</p> <p>7.Question: What is the amount of work done in moving a point charge around a circular arc of radius r at the centre of which another point charge is located?</p> <p>8.Question: Two equal balls having equal positive charge 'q' coulombs are suspended by two insulating strings of equal length. What would be the effect on the force when a plastic sheet is inserted between the two?</p> <p>9.Question: The given graph shows variation of charge 'q' versus potential difference 'V' for two capacitors C_1 and C_2. Both the capacitors have same plate separation but plate area of C_2 is greater than that of C_1. Which line (A or B) corresponds to C_1 and why?</p> <p>10.Question: A charge 'q' is moved from a point A above a dipole of dipole moment 'p' to a point B below the dipole in equatorial plane without acceleration. Find the work done in the process.</p> <p>11.Question: Derive the expression for the electric potential at any point along the axial line of an electric dipole.</p>	Physics Notebook + Printed model/PPT/Chart

12.Question: Derive an expression for the potential energy of an electric dipole of dipole moment p in the electric field E .

13.Question: Two point charges, $q_1 = 10 \times 10^{-8} \text{ C}$, $q_2 = -2 \times 10^{-8} \text{ C}$ are separated by a distance of 60 cm in air. (i) Find at what distance from the first charge, q_1 , would the electric potential be zero. (ii) Also calculate the electrostatic potential energy of the system.

14.Question: Two point charges $4Q$, Q are separated by 1 m in air. At what point on the line joining the charges is the electric field intensity zero? Also calculate the electrostatic potential energy of the system of charges, taking the value of charge, $Q = 2 \times 10^{-7} \text{ C}$.

15.Question: Two point charges $20 \times 10^{-6} \text{ C}$ and $-4 \times 10^{-6} \text{ C}$ are separated by a distance of 50 cm in air. (i) Find the point on the line joining the charges, where the electric potential is zero. (ii) Also find the electrostatic potential energy of the system.

16.Question: The potential difference applied across a given conductor is doubled. How will this affect (i) the mobility of electrons and (ii) the current density in the conductor? Justify your answers. (CBSE 2023)

17.Question: Briefly describe how the current sensitivity of a moving coil galvanometer can be increased. (CBSE 2023)

18.Question: A galvanometer shows full-scale deflection for current I_g . A resistance R_1 is required to convert it into a voltmeter of range (0-V) and a resistance R_2 to convert it into a voltmeter of range (0-2V). Find the resistance of the galvanometer. (CBSE 2023)

19.Question: Explain how free electrons in a metal at constant temperature attain an average velocity under the action of an electric field. Hence obtain an expression for it. (CBSE 2023)

20.Question: Consider two conducting wires A and B of the same diameter but made of different materials joined in series across a battery. The number density of electrons in A is 1.5 times that in B. Compare the drift velocities of electrons in the two wires.

21.Question: State and explain Kirchhoff's laws with an example. (Years: 2017, 2019, 2023)

22.Question: Derive the relation between current density, drift velocity, and electric field. (Years: 2016, 2021)

23.Question: A potentiometer is used to measure the EMF of a cell. Explain why a potentiometer is preferred over a voltmeter for such measurements.

24.Question: Define resistivity and explain its dependence on temperature for a metallic conductor..

25.Question: Explain the principle of a Wheatstone bridge

26.Question: The following figure shows a complex network of conductors which can be divided into two closed loops like ACE and ABC. Apply Kirchoff's voltage rule

27.Question: In a meter bridge with a standard resistance of 15Ω in the right gap, the ratio of balancing length is 3:2. Find the value of the other resistance.

28.Question: In a meter bridge, the value of resistance in the resistance box is 10Ω . The balancing length is $l_1 = 55 \text{ cm}$. Find the value of unknown resistance.

29.Question: An electric heater of resistance 10Ω connected to 220 V power supply is immersed in the water of 1 kg . How long the electrical heater has to be switched on to increase its temperature from 30°C to 60°C . (The specific heat of water is $s = 4200 \text{ J kg}^{-1}$)

30.Question: What is the value of x when the Wheatstone's network given below is balanced? $P = 500 \Omega$, $Q = 800 \Omega$, $R = x + 400$, $S = 1000 \Omega$

MAJOR PROJECT OPTIONS (Choose One)

(Students have a choice to tie themselves up in groups, make sure that each group must not have more than 3 students)

1. ⚡ Electrostatic Field Mapping Board (Application of Chapter 1 & 2)
Create a board using a plastic/acrylic sheet and aluminium foil pieces. Use a simple electroscope or a digital multimeter to show how fields behave around different charge configurations. Draw and label equipotential lines using graphite pencil on paper and observe with foil-paper charges.

2.  DIY Capacitor Bank Demonstration (Chapter 2)

Build capacitors using aluminium foil and plastic sheets.

Arrange them in series and parallel to demonstrate the change in

	<p>capacitance. Measure and document voltage and charge changes using a basic multimeter.</p> <p>3  Household Electricity Audit (Chapter 3)</p> <p>Identify current and voltage ratings of appliances at home.</p> <p>Estimate energy consumption and power costs. Make suggestions for energy-efficient alternatives.</p> <p>4.  Magnetic Field Sensor using Phone + Compass (Chapter 4)</p> <p>Use the magnetometer app on a smartphone. Calibrate and map magnetic fields near wires carrying current (under supervision).</p> <p>Explore Earth's magnetic field direction and how it changes with orientation.</p> <p> MINI TASKS (Choose Two) (These tasks are to be done individually)</p> <ol style="list-style-type: none">  Concept Comics Design a comic strip (on paper or digitally) that explains "Electric Field Lines" or "Capacitance in Parallel" through storytelling or animation-style panels.  Case Study: Physics Behind a Lightning Rod Research how electrostatics helps protect buildings. Write a 1–2 page case study including diagrams and safety tips.  Numerical Investigation Journal Select 5 different problems (1 from each chapter), solve them, and explain why the concept applies in each case. <p>Add real-life analogies.</p> <p>4.  Field Experiment: Resistance and Length Use pencil leads or wires of varying lengths. Measure resistance using a multimeter and plot R vs. L graphs. Conclude how resistance varies with length.</p> <p>5.  Video Explainer Create a short 3–4 minute video explaining one concept (e.g., Gauss's Law, Ohm's Law, Biot–Savart Law) using household items, sketches, and animations. (Students can refer to already existing videos on youtube)</p> <p>Submission Format: Compile the major project with a title page, objective, method, observations, conclusion, and photos.</p> <p>Submit mini tasks in a folder or digitally as a PDF or video link.</p>	
Chemistry	Chapter (alcohol, phenols and ethers)	

	<p>learn all NCERT intext and exercise questions</p> <p>Chapter (aldehyde, ketone and carboxylic acid)</p> <p><i>Learn all NCERT intext and exercise questions</i></p> <p>Chapter (haloalkanes and haloarenes)</p> <p>Learn all NCERT intext and exercise questions</p> <p>(Extra questions will be provided in your respective group);</p> <p>Experiment: 1. Preparation of Organic Compounds</p> <p>Preparation of any one of the following compounds</p> <ol style="list-style-type: none"> 1. Acetanilide 2. Di-benzalAcetone 3. p-Nitroacetanilide 4. Aniline yellow or 2 - Naphthol Aniline dye. <p>2. Tests for the functional groups present in organic compounds</p> <p>Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.</p>	
<p>Mathematics</p>	<p>Subject: Mathematics Class: XII</p> <p> Teacher's Instructions</p> <p>Students are required to complete the following assignments neatly and creatively, keeping in mind the principles of Art-Integrated Learning (AIL) as recommended by CBSE.</p>	

1. NCERT Chapters 5 to 7

Chapters Covered:

-  Chapter 5 – Continuity and Differentiability
-  Chapter 6 – Application of Derivatives
-  Chapter 7 – Integrals

Instructions:

-  Use separate notebook(s) for solving.
-  Work must include:
 -  Handwritten notes with definitions and key concepts.
 -  Solved examples from the NCERT textbook.
 -  Complete exercise solutions for each chapter.
 -  Assignment questions, shared by the teacher.
-  Begin each chapter with a colorful mind map showing a summary of the concepts.
-  Ensure clean handwriting, organized presentation, and proper headings.

Art-Integration Tips:

-  Use color-coded mind maps with creative diagrams and borders.
-  Decorate pages with math-inspired patterns or Indian folk art (e.g., Madhubani, Warli, Gond).
-  Add real-life visuals or symbols to represent each mathematical concept.

2. Mathematics Lab Practicals

Instructions:

-  Select any 5 practicals from the CBSE Maths Lab Manual (available on the CBSE academic website).
-  Write each practical in the proper format:
 -  Aim
 -  Materials Required

- o Procedure
- o Observations
- o Conclusion

 Art-Integration Tips:

- ? Make a creative cover page with math-art designs.
- ? Illustrate graphs and instruments with colored sketches or diagrams.
- ? Incorporate geometric or tribal art patterns in borders and headings.

 3. Mathematics Project

 Instructions:

- ? Choose any project based on your syllabus. Suggested topics:
 - o Applications of Derivatives in Real Life
 - o Area under Curves (Integration in Practice)
 - o Probability and Daily Life Events
- ? Follow a structured format:
 - o Introduction
 - o Objective
 - o Data Collection
 - o Mathematical Explanation
 - o Conclusion

 Art-Integration Tips:

- ? Present the project using charts, graphs, colorful visuals, and regional art forms.
- ? Integrate themes such as Madhubani borders, Gond animal patterns, or Warli stick figures.
- ? You may even use collage, craft, or foldables to make it interactive.

 4. Formula Chart

	<p> Instructions:</p> <p>? Prepare a chart paper displaying formulas from one chosen topic (e.g., Integrals or Application of Derivatives).</p> <p>? The chart should be colorful, neat, and informative.</p> <p> Art-Integration Tips:</p> <p>? Use a creative theme such as:</p> <ul style="list-style-type: none"> o “Math Garden” – Each flower or leaf contains a formula o “Galaxy of Formulas” – Planets/stars show each concept <p>? Incorporate traditional art styles in decoration and design.</p> <p> Submission Date: First day after Summer Vacation</p> <p> Note to Students:</p> <p>This holiday homework is designed to help you revise key concepts creatively. Use your imagination and effort to make your work unique and engaging! All assignments must be handwritten and submitted in proper format.</p>	
Biology	<p>Reading/learning : Learn all the chapters done till now.</p> <p>Writing : Do and practice these questions in your notebook .</p> <p>Q1The microscopic Pollengrains of the past are obtained as fossils. mention the characteristics of the pollengrains that makes it happen.</p> <p>Q2Name the component cells of the egg apparatus in an embryo sac.</p> <p>Q3 The Diploid number of chromosomes in an angiospermic plant is 16 . what will be the number of chromosomes in its endosperms and antipodal cells.</p> <p>Q4 Pollen grains in wheat are shed at 3-celled stage while in peas they are shed at 2- celled stage. Explain. Where are germ pores present in pollen grains.</p> <p>Q5Women experience 2 major events in their lifetime, one at menarche and the second at menopause .mention the characteristics of both the events.</p>	Bio notebook, ppt and practical file

Q6 A proper understanding of menstrual cycle can help immensely in family planning. do you agree with the statement? Provide reasons for your answer.

Q7 A colour blind man marries a woman with normal vision whose father was colour blind. Workout a cross to show the genotype of the couple and their respective sons.

Q 8Name the negatively charged and positively charged components of a nucleosone.

Q9What is cistron?

Q10 Mention two functions of the codan AUG.

Activity Make a ppt every student in ch1 ,2, 3 ,4 and 5 any topic

Activity/Project: Do the following practical in your practical file...

Ex 1Isolation of DNA from available plant material such as spinach or papaya.

EX2 To study flower adopted pollination by different agencies such as wind ,insects and birds

Ex3 To study the pollen germination on stigma through a permanent slide .

Ex4 To study meiosis in onion bud cells.

EX 5To study the T.S. of blastula through a permanent slide.

Ex6 To study Mendelian inheritance in different colour and size of seeds in pea plant .

Ex7 To study pedigree chart of genetic traits such as blood group colour blindness widow's peak.

Ex 8To study control pollination emasculation tagging and bagging

Ex9To study reproductive part of flower

Ex10 To study the collected sample from 2 different water bodies and study for pH clarity and presence of living Organism

Ex 11To study the plant population density by quadrature method

Ex12To study the plant population frequency by quadrature method

	<p>Ex13 To study the temporary mount of onion root tip for different stage in mitosis</p> <p>Ex14 To study pollen grain germination on slide</p> <p>Ex15 To study model showing homologous analogous organ implant and animal</p>	
English	<p>Section A: Literature (Flamingo)</p> <p>Lessons: Read the following prose lessons from Flamingo and complete the tasks:</p> <p>The Last Lesson – Write a diary entry from the perspective of Franz expressing his thoughts and emotions.</p> <p>Lost Spring – Write a character sketch of Saheb along with a summary.</p> <p>Deep Water – Identify key events that led to the narrator’s fear and how he overcame it.</p> <p>The Rattrap – Create a dialogue between the peddler and Edla after Christmas.</p> <p>Indigo – Research and write a short biography of Mahatma Gandhi and connect it with the lesson.</p> <p>Poems: Read and analyze the following poems. Write 10 lines of reflection for each:</p> <p>My Mother at Sixty-Six – Express your feelings about aging and separation.</p> <p>Keeping Quiet – Write a poem of your own inspired by this one, focusing on peace or introspection.</p> <p>A Thing of Beauty –write summary in your own words and identity the poetic device.</p> <p>Section B: Creative Assignments</p> <p>Vacation Journal – Maintain a daily journal for 7 days describing your vacation activities, observations, and emotions.</p> <p>Travel Brochure – Design a travel brochure for a place you visited or want to visit during the holidays.</p> <p>Short Film Script – Write a short script (1-2 pages) for a film about the best or worst vacation ever.</p> <p>Section C: Creative Activities</p> <p>Poster Making – Make a poster on “The Importance of Mental Health for Teenagers.”</p>	English HW Notebook

	<p>Collage Work – Create a collage on “Memorable Moments of My Vacation.”</p> <p>Poetry Slam – Compose and record a video reciting a self-written poem on “Youth and Freedom.”</p> <p>Section D: Essays</p> <p>How Vacations Shape Teen Personalities</p> <p>Technology and Teenagers: A Double-Edged Sword</p> <p>The Importance of Traveling for Young Minds</p>	
Yoga	<p>Topic: Practical File on Yogasanas</p> <p>Instructions for Students:</p> <p>Prepare a practical file including the following:</p> <ol style="list-style-type: none"> 1. 1. Yogasanas (Total: 20 Asanas) <ul style="list-style-type: none"> • 5 Standing Asanas • 5 Sitting Asanas • 5 Supine Asanas • 5 Prone Asanas 2. 2. Pranayams – 8 types 3. 3. Mudras – 2 types 4. 4. Bandhas – 2 types <p>For Each Asana/Pranayam/Mudra/Bandha, Include:</p> <ol style="list-style-type: none"> 5. 1. Name (□□□□□□ □□ □□□) 6. 2. Method (□□□□ □□ □□□□) – Step-by-step performance instructions 7. 3. Benefits (□□□) 8. 4. Precautions (□□□□□□□□□□) – Who should avoid it and safety tips 9. 5. Your Photograph – Paste your own picture performing the asana neatly labeled on the same page <p>Additional Academic Instructions:</p> <ul style="list-style-type: none"> • Revise Unit 1 thoroughly. 	Yoga Journal with pictures

	<ul style="list-style-type: none"> • Read Part A of the Yoga syllabus – Employability Skills. <p>Presentation Guidelines:</p> <ul style="list-style-type: none"> • Use A4-size practical file • Use colored pens, sketches, and borders for neat and attractive presentation • Write in clear, legible handwriting • Decorate the cover page creatively • Label each photograph with the asana name <p>Marks Will Be Awarded For:</p> <ul style="list-style-type: none"> • Neatness • Accuracy • Creativity <p>Submission Date: First day after holidays</p>	
Music	<p>Part A – Theoretical Work (To be done in a project file)</p> <p>1. Historical Development of Time Theory of Ragas</p> <p>Define the Time Theory in Indian Classical Music.</p> <p>Discuss its origin and development over centuries.</p> <p>Role of ancient texts like Sangeet Ratnakar, Raga Vibodha, etc.</p> <p>Time classification: Poorv Raga, Uttar Raga, and their characteristics.</p> <p>Relevance of time theory in today’s music performances.</p> <p>2. Research on Sangeet Ratnakar</p> <p>Author: Pt. Sharangdev – brief life sketch.</p> <p>Importance and structure of the Sangeet Ratnakar.</p> <p>Its contribution to Hindustani and Carnatic music systems.</p> <p>Main contents: seven chapters (saptadhyayi) – with summary.</p> <p>Influence on later musicological works.</p> <p>3. Life Sketch and Contribution of Ustad Bade Ghulam Ali Khan</p> <p>Brief biography (birthplace, training, early influences).</p>	Handwritten note, chart and sketch.

	<p>Gharana – Patiala Gharana.</p> <p>Unique features of his gayaki (style of singing).</p> <p>Famous ragas and compositions performed.</p> <p>Contribution to Hindustani classical music and legacy.</p> <p>4. Make a chart on any topic of music or musical instrument showing creativity by using colours.</p> <p>- Making a chart is compulsory for all...</p>	
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Tagore Sr Sec School , Barwa

Summer Holiday Homework

Class-XII(Computer Sci)

Q1. Write a Python program to display "Welcome to Python Programming".

Q2. Declare variables of different data types: integer, float, string, and boolean. Assign values to these variables and print them.

Q3. Write a Python program to perform the following operations: addition, subtraction, multiplication, division, and modulus. Display the results.

:", modulus)

Q4. Write a Python program to take two numbers as input from the user and display their sum.

Q5. Write a Python program to check if a number entered by the user is positive, negative, or zero.

Q6. Write a Python program to print the first 10 natural numbers using a for loop.

Q7. Write a Python program to calculate the factorial of a number using a while loop.

Q8. Write a Python function that takes two numbers as arguments and returns their sum.num2))

Q9. Write a Python function to check whether a number is prime.

Q10. Write a Python program to create a list of 5 fruits, add another fruit to the list, and print the updated list.

Q11. Write a Python program to create a tuple of 5 vegetables and print the third vegetable.

Q12. Write a Python program to create a dictionary with 3 key-value pairs representing a student's name, age, and grade. Update the grade and print the updated dictionary.

Q13. Write a Python program to generate a list of squares of numbers from 1 to 10 using list

- Q14. Write a Python program to count the number of vowels in a given string.
- Q15. Write a Python program to reverse a string.
- Q16. Write a Python program to read a text file and print its contents.
- Q17. Write a Python program to handle division by zero exception.
- Q18. Write a Python program that imports the **math** module and calculates the square root of a number.
- Q19 Create a Python module named **mymodule.py** with a function that adds two numbers. Import this module in another script and use the function.
- Q20 Write a Python program that reads data from one text file, manipulates it, and writes the modified data to another text file.
- Q21 Write a Python program to write a list of integers to a binary file.
- Q22. Write a Python program to read the list of integers from the binary file created in Exercise 1 and print them.
- Q23. Write a Python program to append more integers to the binary file created in Exercise 1.
- Q24. Write a Python program to read the updated list of integers from the binary file after appending more data in Exercise 3 and print them.
- Q25. Write a Python program to define a class named **Student** with attributes **name** and **grade**. Create a list of **Student** objects and write it to a binary file. Then, read the list from the binary file and display the students' details.
- Q26 Write a Python program to define a class named **Student** with attributes **name** and **grade**. Create a list of **Student** objects and write it to a binary file. Then, implement a function to read the list from the binary file and search for a student by name.
- Q27 Write a Python program to create a list of dictionaries representing students with attributes **name**, **age**, and **grade**. Write this list to a CSV file.
- Q28. Write a Python program to read the list of students from the CSV file created in Exercise 1 and print each student's details.
- Q29. Write a Python program to search for a student by name in the CSV file and print their details.
- Q30. Write a Python program to append a new student's details to the existing CSV file.
- Q31. Write a Python program to update the grade of a student in the CSV file.
- Q32 Revise notes of ch -1 to 5

Q33. Solve all ch-1 to 5 Application based q.

Q34. Learn ch-1 to5 Solution time and ex.

Q35. Prepare program file given 10 python program

 Note:

- All homework is to be submitted on the first day after summer vacation.
- Creativity and neatness will carry extra marks.
- All projects must be handwritten unless stated otherwise.