SRI RAM KRISHAN DAV PUBLIC SCHOOL,SURIYA(GIRIDIH)

DIWALI AND CHHATH PUJA HOLIDAY HOME WORK
SESSION(2026-27)
CLASS-XII(SCIENCE)

English

Prepare the project work on one of the chapters and its writer in details. Follow the guidelines given for preparing the project work.

Biology

Chapter: Biotechnology – Principles and Processes

1. Prepare a flowchart showing the major steps involved in recombinant DNA technology.
2. Draw and label the structure of a cloning vector (pBR322) and mention its important features.
3. Explain the role of restriction enzymes, DNA ligase and DNA polymerase in genetic engineering.
4. Differentiate between PCR, gel electrophoresis and recombinant DNA technology.
5. Prepare a concept map covering the tools of recombinant DNA technology and their functions.

Activity-Based Work: Draw a neat, labelled diagram illustrating the process of gene cloning using a suitable vector.

Note: All work must be done in biology notebook.

Physics

Solve NCERT exercise and exemplar questions of chapter:- Wave optics, Dual nature of matter and radiation & Atoms.

Chemistry

Name reactions
Conversion.

Physical Educatiion

1. Prepare Lab manual.

Maths

Q1) Solve the miscellaneous exercise of chapter differential equation.

Q2) Instructions

1. Perform all five activities in the Mathematics activity/practical file.
2. Write each activity neatly under the headings: Aim, Materials Required, Mathematical Background, Procedure, Observation and Result.
3. Draw clear, labelled diagrams and graphs wherever required.
4. Show all necessary calculations and write the conclusion in your own words.

Activity 1: Relations and Functions

Task: Verify that the relation R on the set of all lines in a plane, defined by perpendicularity, is symmetric but neither reflexive nor transitive.

What to include: Draw suitable pairs or sets of lines and use them to check the three properties of the relation.

Activity 2: Equivalence Relation

Task: Verify that the relation R on the set of all lines in a plane, defined by parallelism, is an equivalence relation.

What to include: Use diagrams to examine reflexivity, symmetry and transitivity.

Activity 3: One-One and Onto Functions

Task: Demonstrate a function that is onto but not one-one.

What to include: Choose a suitable function, state its domain and codomain, and illustrate the mapping using a mapping diagram or graph.

Activity 4: Inverse Trigonometric Functions

Task: Draw the graph of $y = \sin^{-1}x$ using the graph of $y = \sin x$ and demonstrate reflection about the line $y = x$.

What to include: Draw the restricted sine graph, its inverse, and the line $y = x$ on suitable axes. Mark the domain and range.

Activity 5: Applications of Derivatives

Task: Understand increasing and decreasing functions with the help of graphs.

What to include: Draw suitable graphs, identify intervals where the function increases or decreases, and relate the observations to the sign of the derivative.

Submission

Submit the completed Mathematics activity/practical file after the holidays. Ensure that all five activities are complete, properly labelled and neatly presented.

Computer Science

Q1. Python Functions
Write a Python program to define a function SumEven(L) that accepts a list of numbers and returns the sum of all even numbers in the list.
Q2.Write Python statements to:

1. Display the marks of Neha.
2. Add a new entry "Rahul": 88.
3. Update Ravi's marks to 80.
4. Display all student names.
5. Display the complete dictionary.