

RAHUL MODEL SENIOR SECONDARY PUBLIC SCHOOL
Recognised & Affiliated to CBSE
Railway Road, Sadh Nagar-II, Palam Colony, New Delhi

SUMMER HOLIDAY HOMEWORK
CLASS – XII SCIENCE

ENGLISH

1. Write Notices on the following occasions (one of each category) (3x4=12 Marks)
(Do this in English notebook)

- a. Tours
- b. Sports
- c. Cultural / Extra- curricular activities
- d. Appeals

2. Write articles on the following topics (Word-limit 150- 200) (4x4=16 Marks)
(Do this in English notebook)

- a. My vision of future India
- b. Digital education in India
- c. Women safety in India
- d. 50- years of Earth Day

3. Letter to the Editor (150-200 words) (Do this English notebook) (4x4=16 Marks)

- a. Address topics like rising cybercrime,
- b. the need to ban plastic bags,
- c. increasing traffic jams,
- d. neglect of historical monuments.

4. Advertisements & Invitations (Do this in English notebook) (1x3= 3 Marks)

Design a colourful, creative, handwritten advertisement for a local summer event or an invitation for a fictitious launch party.

5. Make a collage- highlights the writers and poets featured in CBSE class 12 curriculum (Flamingo and vistas), incorporating their key literary contributions. **(1x3= 3 Marks)**

(Do this in A3 size sheet)

PHYSICS

I. Project File (Investigatory Project) (20)

- Binding File
- Paste related Picture.
- Paste related circuits/ observation/ conclusion

1. To study various factors on which the internal resistance / emf of a cell depends.

(Pankaj Meena, Gagan Meena, Nishika, Vanshika Chauhan)

2. To study the variation in current flowing in a circuit containing a LDR, because of a variation in-

(i) The power of the incandescent lamp, used to illuminate the LDR keeping all the lamps at fixed distance.

(ii) The distance of incandescent lamp (of fixed power) used to 'illuminate' the LDR.

(Atharv Shukla, Himanshu Sharma, Piyush, Parmeet)

3. To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, a equiconvex lens, (made from a glass of known refractive index) and an adjustable object needle.

(Vanshika Gupta, Jyoti, Mayank Singh, Riya)

4. To investigate the relation between the ration of-

(i) Output and input voltage and

(ii) Number of turns in the secondary coil and primary coil of a self designed transformer.

(Abdur, Pushkar, Deepanshu, Yash Negi)

5. To investigate the dependence of the angle of deviation on the angle of distance, using a hollow prism filled, one by one with different transparent fluids.

(Mohit, Mayank Jha, Kaushal Arya, Ayushi)

6. To estimate the charge induced on each one of the two identical Styrofoam (or pith) balls suspended in a vertical plane by making use of Coulomb's law.

(Hardik, Ronak, Pranav, Priyanshu)

7. To study the factor on which the self inductance of a coil depends by observing the effect of this coil, when put in series with a resistor (bulb) in a circuit fed up y an a.c. sourec of adjustable frequency.

(Anshi Pal, Palak, Bhavishya, Saumyadeep)

8. To study the earth's magnetic field using a compass needle – bar magnet by plotting magnetic field liens and tangent galvanometer.

(Abhigyan, Vishant, Tanishka, Sagar, Sujal)

II. Activity File

(20)

- Binding File/Stick File
- Make proper circuit diagram/ graph
- Paste related picture (if required)

Section - A

1. To measure the resistance and impedance of an inductor with or without iron core.

2. To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.

3. To assemble a house circuit, comprising three bulbs, three (on/off) switches, a fuse and a power source.

4. To assemble the components of a given electrical circuit.

5. To study the variation in potential with length of a wire for a steady current.

Section – B

6. To identify a diode, on LED, a resistor and a capacitor from a mixed collection of such items.

7. To use a multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether given electronic components (eg. Diode) is in working order.

8. To study the effect of light (by varying the distance of the source) on an LDR (light dependent resistor)

9. To observe the refraction and leteral deviation of a beam of light incident obliquely on a glass slab.

10. To observe diffraction of light due to a thin slit.

III. Make Assignment on Practical sheet in report file (Minimum 5-10 pages) (10)

(A) State the following- (3)

- (i) Coulomb's Law
- (ii) Gauss's Law
- (iii) Electric Flux
- (iv) Equipotential Surface
- (v) Electric Dipolar
- (vi) Electric Charge

(B) Give reason- (2)

(i) Two electric field line never cross each other why?

(C) State Gauss's theorem in electrostatics. Prove that not electric field exists inside a hollow charges sphere. (2)

(D) Two charges $5 \times 10^{-8} \text{ C}$ and $-3 \times 10^{-8} \text{ C}$ are located 16 cm apart. At what point P (P lies somewhere in between the charges) on the line joining the two charges is the electric potential zero? Take the potential at infinity to be zero. (3)

CHEMISTRY

1. Project File (Investigatory Project) (30)

- Binding file (Minimum 12-15 pages)
- Paste related pictures
- Paste related samples

(a) Study of presence of oxalate ions in guave fruit at different stages of ripening.

(Atharv Shukla, Palak, Sujal, Riya, Saumyadeep)

(b) Study of quantity of casein present in different sampels of milk.

(Bhavishya, Ronak Raj, deepanshu, Vanshika Gupta)

(c) Preparation of soyabean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, taste etc.

(Himanshu Sharma, Mayank Singh, Pranav, Ayushi, Mohit Meena)

(d) Study of effect of Poatssium bisulphate as food preservative under various conditions temperature, Concentration, time etc.

(Pushkar, Sagar, Parmeet, Anshi)

(e) Study of digestion of starch by salivary amylase and effect of PH and temperature on it.

(Jyoti, Piyush, Priyanshu, Gagan, Mayank Kumar Jha)

(f) Comparison study of the rate of fermentation of following materials-wheat flour, gram flour, potato juice, carrot juice.

(Pankaj, Abdur, Vishant, Nishika)

(g) Extraction of essential oils present in saunf (aniseed), ajwain (carum) , Illaichi (cardamom)

(Tanishka, Yash, HArdik, Ayush Kesharwani)

(h) Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chilli powder and pepper.
(Kushal, Vanshika Chauhan, Abhigyan)

2. Make assignment on Practical Sheet in report file. (Minimum 8 pages) (20)

(A) State the following (5)

- (i) Henry Law
- (ii) Raoult Law
- (iii) Kohlrausch law
- (iv) Faraday first law of electrolysis
- (v) Faraday second law of electrolysis

(B) Give reasons: (5)

- (i) Cooking is faster in pressure cooker than in an open pan.
- (ii) On mixing liquid X and Y, volume of the resulting solution decreases. What type of deviation shown? What change in temperature?
- (iii) Define Azeotrope. What are their types? Give examples.

(C) (i) Define the following terms: (5)

- * Ideal solution
- * Osmotic pressure
- * Reverse osmosis and its application

(ii) The freezing point of a solution containing 5g of benzoic acid (molar mass – 122 g/mol) in 35 g of benzene is depressed by 2.94k. Calculate the percentage association of benzoic acid if it form dimer in solution. (K_f for benzene = 4.9 kkgmol^{-1})

(D) (i) Define the following: (5)

- Elevation in boiling point with graph.
- Depression in freezing point with graph.

(ii) What happens when red blood cells are kept in 0.5 (mass/volume) NaCl solution? Justify your answer.

(iii) What is the value of Vant Hoff factor in following case-

$\text{C}_6\text{H}_{12}\text{O}_6$

Urea

MgCl_2

FeSO_4

$\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

COMPUTER SCIENCE

1. Make a practical file (10 Marks)

- Minimum 15 Python Programs

2. Draw on A-3 Size sheet (10 Marks)

Roll No.

Topic

1-10

Types of SQL Commands

11-20

Python Data Types

21-30

Types of Python files (with modes and functions)

30-40

Functions in Random Module

3. Solve the following Assignment in notebook.

(30 Marks)

(i) What are comments? Write the ways to write comments.

(ii) Evaluate the following expressions:

(a) $(2+3) * 5/4 + (4+6)//2$

(b) $12 + (3**4 - 6) //2$

(iii) Rewrite the code after removing all syntax error(s).

Underline each correction done in the code:

```
input("enter a word", w)
```

```
if w = "hello"
```

```
    print("ok")
```

```
else:
```

```
    print("not ok")
```

(iv) Write a program to input an integer and check whether it is a prime number or not.

(v) Write a program to input an integer and find the product of its odd digits.

(vi) Write the output of the following python code:

```
def fun(x,y=100):
```

```
    temp = x + y
```

```
    x += temp
```

```
    if(y!=200):
```

```
        print(temp, x, y)
```

```
a=20
```

```
b=10
```

```
fun(b)
```

```
print(a,b)
```

```
fun(a,b)
```

```
print(a,b)
```

(vii) Write output-

```
def f():
```

```
    global a
```

```
    print(a)
```

```
    a="hello"
```

```
    print(a)
```

```
a="world"
```

```
f()
```

```
print(a)
```

(viii) Write a function to convert the letters in uppercase and create a duplicate copy of the file.

(ix) Write a function to read the content from one file and display the alternate line.

(x) Write a function to write data in a binary file.

(xi) Write a function to read data from a binary file.

- (xii) Write a function to search any word from a binary file.
- (xiii) Write a function to add a record in a CSV file.
- (xiv) Write a function to find maximum marks from a CSV file.
- (xv) Write a function to read a text file and display those words which are having the length of exactly 4 characters.

MATHEMATICS

Q01. If A, B and C are square matrices of order 3 and $|BC| = 2|A|$, then find $|2A^{-1}BC|$.

OR

If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 5 \end{bmatrix}^{-1}$, then find matrix A.

Q02. Let A(1, 3), B(0, 0) and C(k, 0). Using determinants, find k when the area of ΔABC is 3 square units.

Q03. If $\begin{vmatrix} x & \sin \theta & \cos \theta \\ -\sin \theta & -x & 1 \\ \cos \theta & 1 & x \end{vmatrix} = 8$, then write the value of x, $x \in \mathbb{R}$.

Q04. If $f(x) = \begin{vmatrix} a & -1 & 0 \\ ax & a & -1 \\ ax^2 & ax & a \end{vmatrix}$, then find $f'(x)$.

Q05. Find $|3AB|$, if $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 3 \\ 4 & 2 \end{bmatrix}$.

Q06. If A, B and C are angles of a triangle, then find the value of $\begin{vmatrix} \sin(A+B+C) & \sin B & \cos C \\ -\sin B & 0 & \tan A \\ \cos(A+B) & -\tan A & 0 \end{vmatrix}$.

Q07. If $A = \begin{pmatrix} 2 & 1 & -1 \\ 3 & 1 & -2 \\ 1 & 0 & -1 \end{pmatrix}$ such that $AB = BA = O$, then find B; when it is given that B is non-zero matrix.

OR

If $A = \begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}$ and $B^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$, find $(AB)^{-1}$. Also, find $|(AB)^{-1}|$.

Q08. **CASE STUDY :** A scholarship is a sum of money provided to a student to help him or her pay for education. Some students are granted scholarships based on their academic achievements, while others are rewarded based on their financial needs.

Every year a school offers scholarships to girl children and meritorious achievers based on certain criteria. In the session 2022-23, the school offered monthly scholarship of ₹3000 each to some girl students and ₹4000 each to meritorious achievers in academics as well as sports.



In all, 50 students were given the scholarships and monthly expenditure incurred by the school on scholarships was ₹180000.

Based on the above information, answer the following questions.

- (i) Express the given information algebraically using matrices.
- (ii) Check whether the system of matrix equations so obtained is consistent or not.

- (iii) Find the number of scholarships of each kind given by the school, using matrices.
 (iv) Had the amount of scholarship given to each girl child and meritorious student been interchanged, what would be the monthly expenditure incurred by the school?

Q09. If $A = \begin{bmatrix} 1 & 2 & 1 \\ 1 & 0 & 3 \\ 2 & -3 & 0 \end{bmatrix}$, find A^{-1} .

Using the above obtained inverse of matrix A, solve the following system of equations :
 $x + 2y + z = 7$, $x + 3z = 11$, $2x - 3y = 1$.

Q10. If $A = \begin{bmatrix} 1 & -1 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ 2 & 4 \end{bmatrix}$, $C = \begin{bmatrix} -1 & 2 \\ 1 & -4 \end{bmatrix}$ and $AB - CD = O$ then, find the matrix D.

OR

Find the product $\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix} \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$.

Hence, solve the given system of equations : $x - y = 3$, $2x + 3y + 4z = 17$, $y + 2z = 7$.

Topics - Inverse Trig. Functions

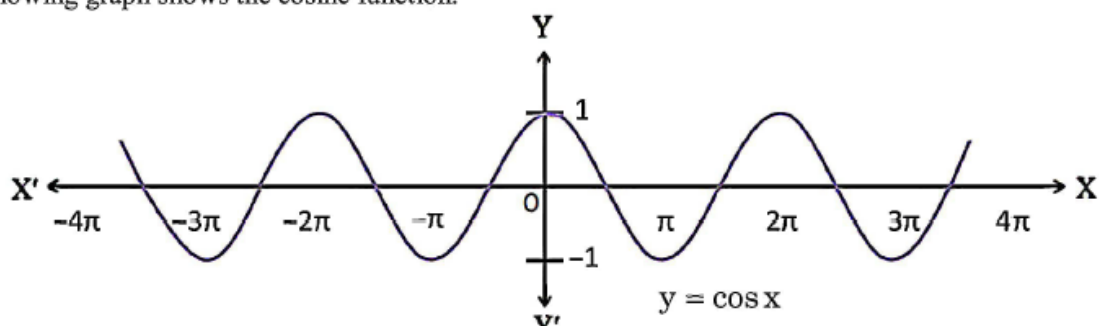
- Q01. Find the domain of $f(x) = \sin^{-1}(3x - 4) + \cos^{-1} x$. Also, find the range of $f(x)$.
 Q02. Draw the graph of $y = \cos^{-1} x$, where $x \in \left[-1, \frac{1}{2}\right]$. Also, write its range.
 Q03. Using principal values, find the value of $(m + n)$, where $m = 4 \sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) + 2 \cot^{-1}(-1) - \sec^{-1}\left(\frac{2}{\sqrt{3}}\right)$
 and $n = \tan^{-1}(1) + \cos^{-1}\left(-\frac{1}{2}\right)$.
 Q04. Using principal values, find the value of $\tan^{-1}\left(\tan \frac{12\pi}{11}\right) + \sin^{-1}\left(\sin \frac{9\pi}{10}\right)$.
 Q05. Find the value of $2 \sin^{-1} x - 3 \cos^{-1} x$, if $x^2 + 2x + 1 = 0$.
 Q06. Find the real solutions of the equation : $\tan^{-1}\sqrt{x(x+1)} + \sin^{-1}\sqrt{x^2+x+1} = \frac{\pi}{2}$.
 Q07. Express $\tan^{-1}\left(\frac{\cos x}{1 - \sin x}\right)$, $-\frac{\pi}{2} < x < \frac{\pi}{2}$ in the simplest form.

OR

Simplify : $\cos^{-1} x + \cos^{-1}\left[\frac{x}{2} + \frac{\sqrt{3-3x^2}}{2}\right]$; $\frac{1}{2} \leq x \leq 1$.

- Q08. **PASSAGE BASED QUESTION** : If a function $f : X \rightarrow Y$ defined as $f(x) = y$ is one-one and onto, then we can define a unique function $g : Y \rightarrow X$ such that $g(y) = x$, where $x \in X$ and $y = f(x)$, $y \in Y$. Function g is called the inverse of f .

The domain of cosine function is \mathbb{R} and function cosine : $\mathbb{R} \rightarrow \mathbb{R}$ is neither one-one nor onto. The following graph shows the cosine function.



Let cosine function be defined from set A to $[-1, 1]$ such that inverse of cosine function exists, i.e., $\cos^{-1} x$ is defined from $[-1, 1]$ to A .

On the basis of above information, answer the following questions.

(i) If A is the interval other than principal value branch, give an example of one such interval.

(ii) If $\cos^{-1} x$ is defined from the interval $[-1, 1]$ to its principal value branch, then find the value of

$$\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) - \cos^{-1}(-1).$$

(iii) Find the domain of $f(x) = 2 \cos^{-1}(1 - x)$.

(iv) Find the range of $f(x) = 2 \cos^{-1}(1 - x)$, if $x \in [0, 1]$.

Q09. Find the interval, in which $\cos^{-1} x > \sin^{-1} x$.

Q10. If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$, then prove that $x^2 + y^2 + z^2 + 2xyz = 1$.

OR

$$\text{Simplify : } \cot^{-1}\left[\frac{1}{\sqrt{x^2 - 1}}\right], x < -1.$$

PHYSICAL EDUCATION

1. CWSN games (5-7 pages)
2. Any one Olympic Games (8-10 pages)
3. Yoga Asana (Any 10)

Note:

Do all the work in Project File (Lab Manual)

BIOLOGY

1. Prepare an Investigatory file on the given topic. (15)
(17-20 pages)
2. Complete the following Assignment
 - (i) Explain double fertilization and triple fusion in 150-200 words. (5)
 - (ii) What is pollination? Describe different types of Pollination in flower.(150-200 words) (5)
 - (iii) Draw the labelled diagram of following- (3 x 5 = 15)
 - (a) Development of dicot embryo
 - (b) T.S of young anther and Enlarged view of Microsporangium
 - (c) Sectional view of female reproductive system
 - (d) Sectional view of Ovary
 - (e) Diagrammatic presentation of various events of menstrual cycle.

- (iv) Explain the phases of embryonic development from morula stage till the establishment of pregnancy in human female. (50-60 words) (3)
- (v) Explain Surgical methods to prevent pregnancies. (30-40 words) (2)
- (vi) Define spermatogenesis and oogenesis with suitable flow charts. (5)