# N M PUBLIC SCHOOL 

## Holiday Homework

## Session -2023-24 <br> Class-XII (SCIENCE)

| PHYSICS | Working model on any topic related to your syllabus. <br> Prepare a project on any topic related to your syllabus. <br> Suggested Investigatory Projects <br> 1. To study various factors on which the internal resistance/EMF of a cell depends. <br> 2. To study the variations in current flowing in a circuit containing an LDR because of a variation in <br> (a) the power of the incandescent lamp, used to 'illuminate' the LDR (keeping all the lamps at a fixed distance). <br> (b) the distance of a incandescent lamp (of fixed power) used to 'illuminate' the LDR. <br> 3. To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, an equiconvex lens (made from a glass of known refractive index) and an adjustable object needle. <br> 4. To investigate the relation between the ratio of (i) output and input voltage and (ii) number of turns in the secondary coil and primary coil of a self-designed transformer. <br> 5. To investigate the dependence of the angle of deviation on the angle of incidence using a hollow prism filled one by one, with different transparent fluids. <br> 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. <br> 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 by an A.C. source of adjustable frequency. <br> 8. To study the earth's magnetic field using a compass needle -bar magnet by plotting magnetic field lines and tangent galvanometer. |
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| ENGLISH | 1 Prepare a project on 'The Thing of Beauty.' <br> 2 Read English newspaper daily during your summer vacation and go through the 'Articles 'and select any five of them which should be of five different dates. Cut them and paste English Grammar Notebook. <br> 3 Prepare a poster on the topic ' Grow More Tree.' <br> 4 Learn given topics for ASL presentation: <br> a. Adventure b. Role Model c. Money d. Education e. Punctuality. |
| HINDI | प्रश्न 1 विभिन्न माध्यमों के लिए लेखन पाठ के प्रश्न उत्तर कॉपी में कीजिए। प्रश्न 2 पत्रकारीय लेखन के विभिन्न रूप और लेखन प्रक्रिया की विस्तारपूर्वक व्याख्या कीजिए। प्रश्न 3 कक्षा में दिये गए परियोजना कार्य को फाइल में कीजिए। |
| CHEMISTRY | TOPICS OF INVESTIGATORY PROJECT FILE ( ONLY TWO STUDENTS CHOOSE THE SAME TOPIC) <br> NOTE:- a) Choose any one topic. <br> b) File should be neat and clean with decoration. <br> 1. Analysis of fertilizer <br> 2. Presence of oxalate ions in guava fruit and different stages of ripening <br> 3. Effect of Potassium Bisulphate as a food preservative <br> 4. Quantity of the presence of casein in different samples of milk <br> 5. Extraction of various essential oils present in Ajwain (Carum), Illaichi (Cardamom) and <br> Saunf (Fennel Seeds) <br> 6. Electrolyte turns on the solar cell <br> 7. Comparative study of the rate of fermentation in the following substances- potato juice, wheat flour, carrot juice, gram flour, etc. <br> 8. Common food adulterants in fat, butter, oil, turmeric powder, pepper, chilli powder, sugar, etc. <br> 9. Preparation of Potash Alum <br> 10. Variation of conductance with temperature in electrolytes <br> 11. Check the ions present in a toothpaste |


|  | 12. Preparation of soya bean milk <br> 13. Determining caffeine in tea samples <br> 14. Effect of Acid Rain on Limestone Rock <br> 15. Green Chemistry: Bio-Diesel and Bio-Petrol <br> 16. Electrochemical Cell <br> 17. Vitamin C in Fruit Juices <br> 18. Effect Of Sodium Carbonate On the Foaming Capacity Of A Soap <br> 19. Environmental Pollution <br> 20. Fermentation <br> 21. Preparation of Toilet Soaps <br> TO PREPARE POWER POINT PRESENTATION ( any one chapter) <br> 1. Solution (Roll No.- $1,4,7,10,13,16,19$ ) <br> 2. Electrochemistry (Roll No.- $2,5,8,11,14,17$ ) <br> 3. Chemical Kinetics (Roll No.- $3,6,9,12,15,18$ ) <br> ELEMENT'S NAME <br> Learn and write 3d,4d and 5d series transition element's name, atomic no. and atomic mass. |
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| PHYSICAL EDUCATION | Students make a practical file on these topic <br> Practical 1 (Fitness tests (administration) <br> Practical 2 ( procedure for Asanas benefit and contraindiaction for any three <br> Asanas for each life style diseases. <br> Practical 3 any one IOA recognised sport/game of choice. Labelled diagram of field \& Equipment. Also mention it's rules Terminologies\& SKills. |
| BIOLOGY | 1. Do previous year's questions questions of lesson 1 to lesson 5 from year 2020 to 2023. Make an assignment on any one topic in minimum 20-25 pages assignment should be done roll no wise accordingly as <br> 1. Human reproduction \& reproductive Health. <br> 2. Molecular basis of Inheritance. <br> 3. Human Health \& diseases. <br> 4. Microbes in human welfare. <br> 5. Biotechnology its principal and application. <br> 6. Ecosystem. <br> 7. Biodiversity \& conservation |
| MATHEMATICS | DO THE WORKSHEET ATTACHED TO THIS PDF |

## Worksheet

## Class:XII

## Chapter6: Matrices

1.If $A=\left[\begin{array}{cc}1 & 0 \\ -1 & 7\end{array}\right]$, then find $K$ such that $A^{2}-8 A+K I=O($ Ans: $K=7)$
2.If $A=\left[\begin{array}{cc}-1 & 4 \\ 1 & 3\end{array}\right]$ and $B=\left[\begin{array}{ll}2 & 5 \\ 1 & 0\end{array}\right]$, then show that $(A+B)^{\top}=A^{\top}+B^{\top}$
3. For what value of x , is $\mathrm{A}=\left[\begin{array}{ccc}0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0\end{array}\right]$ a skew symmetric matrix?(Ans: 2)
4.If $A=\left[\begin{array}{cc}3 & -5 \\ -4 & 2\end{array}\right]$, then find $A^{2}-5 A-141$. Hence obtain $A^{3}$
(Ans: $A^{3}=\left[\begin{array}{cc}187 & -195 \\ -156 & 148\end{array}\right]$ )
5.If $A=\left[\begin{array}{ll}4 & 3 \\ 5 & 2\end{array}\right]$, then find $x$ and $y$ such that $A^{2}-x A+y I=0$. Hence evaluate $A^{-1}$
(Ans: $A^{-1}=\frac{1}{14}\left[\begin{array}{cc}5 & -3 \\ -2 & 4\end{array}\right]$ )
6. Using elementary transformation find the inverse of the matrix
$A=\left[\begin{array}{ccc}2 & 1 & -3 \\ -5 & 3 & 1 \\ -3 & 2 & 3\end{array}\right]$ (Ans: $A^{-1}=\left[\begin{array}{ccc}-\mathbf{7} & \mathbf{- 9} & \mathbf{1 0} \\ -\mathbf{1 2} & \mathbf{- 1 5} & \mathbf{1 7} \\ \mathbf{1} & \mathbf{1} & \mathbf{- 1}\end{array}\right]$ ),
7.Using matrix method, solve the following system of equations:
$\frac{2}{x}-\frac{3}{y}+\frac{3}{z}=10, \frac{1}{x}+\frac{1}{y}+\frac{1}{z}=10, \frac{3}{x}-\frac{1}{y}+\frac{2}{z}=13$ (Ans: $\mathbf{x}=\frac{1}{2}, y=\frac{1}{3}, \mathbf{z}=\frac{1}{5}$ )
8.Find $A^{-1}$, where $A=\left[\begin{array}{ccc}4 & 2 & 3 \\ 1 & 1 & 1 \\ 3 & 1 & -2\end{array}\right]$. Hence solve the following system of linear equations: $4 x+2 y+3 z=2, x+y+z=1,3 x+y-2 z=5$.
(Ans: $A^{-1}=\frac{-1}{8}\left[\begin{array}{ccc}-3 & 7 & -1 \\ 5 & -17 & -1 \\ -2 & 2 & 2\end{array}\right], x=\frac{1}{2}, y=\frac{3}{2}, z=-1$ )
$2 x-y+3 z=5,3 x+2 y-z=7,4 x+5 y-5 z=9$. (Ans: consistent ,infinitely many solutions)
10. Given that $A=\left[\begin{array}{ccc}1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2\end{array}\right]$ and $B=\left[\begin{array}{ccc}2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5\end{array}\right]$, find $A B$. Using this
result, solve the following system of equations: $x-y=3,2 x+3 y+4 z=17$, $y+2 z=7$. (Ans: $A B=6 I, x=2, y=-1, z=4)$

## Class XII Chapter 4 - DETERMINANTS

## Worksheet

## MCQ/ one mark Questions

$1 \quad A$ and $B$ are invertible matrices of the same order such that $(A B)^{-1}=8$.
If $|A|=2$, then $|B|$ is equal to
a) 16
b) 4
c) 6
d) $\frac{1}{16}$

2
The cofactor of the element $a_{23}$ in $\left|\begin{array}{ccc}1 & 2 & -3 \\ -4 & 5 & 3 \\ 0 & 8 & -9\end{array}\right|$ is
a) 8
b) -4
c) 13
d) -8

3
Let $A=\left[\begin{array}{ccc}x & -3 & 1 \\ 2 & y & 1 \\ 1 & 1 & z\end{array}\right]$. If $\mathrm{xyz}=7, \mathrm{x}+\mathrm{y}-6 \mathrm{z}=11$ and I is the identity matrix of order 2. Then, A. adjA is equal to
a) 7 I
b) -5 I
c) 13 I
d) -8 I

4
If $\Delta=\left|\begin{array}{lll}a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33}\end{array}\right|$ and $\mathrm{A}_{\mathrm{ij}}$ is Cofactor of $\mathrm{a}_{\mathrm{ij}}$, then value of $\Delta$ is given by
a) $a_{11} A_{11}+a_{12} A_{21}+a_{13} A_{31}$
b) $a_{11} A_{21}+a_{12} A_{22}+a_{13} A_{23}$
c) $a_{31} \mathrm{~A}_{11}+a_{32} \mathrm{~A}_{12}+a_{33} \mathrm{~A}_{13}$
d) $a_{12} \mathrm{~A}_{12}+a_{22} \mathrm{~A}_{22}+a_{32} \mathrm{~A}_{32}$

5 If A is a square matrix of order 2 and $\mid$ adj. $\mathrm{A} \mid=9$, then $|\mathrm{A}|$ is equal to
a) 3
b) 9
c) 27
d) 81

6 For any $2 \times 2$ matrix if $\mathrm{A}(\operatorname{adj} \mathrm{A})=\left[\begin{array}{cc}10 & 0 \\ 0 & 10\end{array}\right]$ then $|A|$ is equal to
a) 20
b) 100
c) 10
d) 0

7 The Value of k for which the matrix $\left[\begin{array}{cc}k & 2 \\ 3 & 4\end{array}\right]$ has no inverse is
a) $\mathrm{k}=\frac{3}{2}$
b)) $\mathrm{k}=\frac{2}{3}$
c) ) $k \neq \frac{3}{2}$
d) ) $k \neq \frac{2}{3}$

If A is square matrix satisfying $\mathrm{A}^{2}=\mathrm{I}$, then what is the inverse of A ?

If A is a square matrix of order 3 such that $|\operatorname{adj} A|=64$. Find $\left|A^{T}\right|$.
For what value of k , the matrix $\mathrm{A}=\left[\begin{array}{cc}2-k & 3 \\ -5 & 1\end{array}\right]$ is not invertible ?

## Two Marks Questions

12 Write $A^{-1}$ for $A=\left[\begin{array}{ll}2 & 5 \\ 1 & 3\end{array}\right]$
13 If $\mathrm{A}=\left[\begin{array}{rr}4 & 2 \\ 7 & -4\end{array}\right]$, write $\mathrm{A}^{-1}$ in terms of A
14 Find the adjoint of $\left[\begin{array}{cc}1 & -3 \\ 6 & -2\end{array}\right]$
$15 \quad A=\left[\begin{array}{rr}2 & 3 \\ 5 & -2\end{array}\right]$ be such that $A^{-1}=k A$, then find the value of $k$.

## Four/Six marks Questions

16
If $A=\left[\begin{array}{cc}3 & -5 \\ -4 & 2\end{array}\right]$, show that $A^{2}-5 A-14 I=0$. Hence find $A^{-1}$
17 Find the adjoint of the matrix $\left[\begin{array}{ccc}4 & 1 & 3 \\ -3 & 6 & 4 \\ -2 & -2 & 5\end{array}\right]$
18 Verify A. $(\operatorname{adj} A)=(\operatorname{adj} A) \cdot A=|A| I$ for the following matrices

1) $\left[\begin{array}{ccc}-3 & -2 & 1 \\ -5 & 3 & 4 \\ -4 & -2 & 0\end{array}\right]$
2) $\left[\begin{array}{ccc}3 & 0 & -3 \\ -5 & 6 & 4 \\ -1 & -2 & 5\end{array}\right]$

19 Find the inverse of each of the matrices (if it exists)

1) $\left[\begin{array}{ccc}2 & -1 & 3 \\ 3 & 1 & -4 \\ -4 & -2 & 2\end{array}\right]$
2) $\left[\begin{array}{ccc}2 & -2 & 1 \\ -5 & 0 & -4 \\ -1 & -2 & 3\end{array}\right]$

20 Let $A=\left[\begin{array}{ll}3 & 7 \\ 2 & 5\end{array}\right]$ and $B=\left[\begin{array}{ll}6 & 8 \\ 7 & 9\end{array}\right]$. Verify that $(A B)^{-1}=B^{-1} A^{-1}$.

