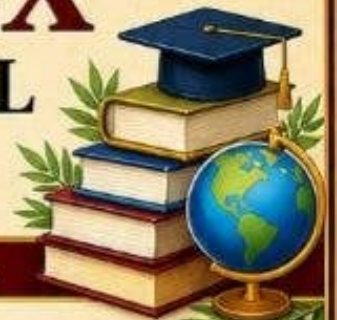




# NORTH-EX<sup>®</sup> PUBLIC SCHOOL — DELHI —



Established 1999 | CBSE Curriculum | Holistic Development




# SUMMER HOLIDAY HOMEWORK

Session 2026-2027



 Student Name : \_\_\_\_\_

 Class : \_\_\_\_\_

 Section : \_\_\_\_\_

 Class Teacher : \_\_\_\_\_

*Explore, Learn & Grow this Summer!*

## OUR THREE BRANCHES - ROHINI, DELHI

### SECTOR-38, ROHINI



Spacious campus with modern infrastructure & senior secondary facilities.

### SECTOR-3, ROHINI



Recognised branch with strong academic foundation & disciplined environment.

### SECTOR-8, ROHINI



Senior Secondary CBSE affiliated campus with advanced learning spaces.

## OUR FACILITIES



SMART  
DIGITAL  
CLASSROOMS



WELL EQUIPPED  
SCIENCE  
LABS



COMPUTER &  
IT LABS



LIBRARY &  
RESOURCE  
CENTRE



SPORTS &  
OUTDOOR  
ACTIVITIES



CO-CURRICULAR  
ACTIVITIES  
(ART, MUSIC, DANCE)



SAFE & SECURE  
CAMPUS  
(CCTV)

★  Complete your work neatly and submit on time. ★ ★

**NORTH-EX PUBLIC SCHOOL**  
(Senior Secondary, Affiliated To CBSE)  
School Block, Jain Nagar, Sector-38, Rohini, Delhi – 81  
SUMMER HOLIDAY HOMEWORK, 2026-27  
CLASS –NOBLE XII

**General Instructions:**

- Learn and revise the syllabus of Periodic Test -1.
- Do your project work neatly.
- Holiday homework should be done in the test register or according to the requirement mentioned.
- Do your work as per the elective subjects

**WEEK – 1**

**MATHEMATICS**

1. Solve the equations  
 $2yz - 3xz + 3xy = 10xyz$   
 $yz - xz + xy = 10xyz$   
 $3yz - xz + 2xy = 13xyz$
2. If  $\sin^{-1}x + \sin^{-1}y + \sin^{-1}z = \frac{3\pi}{2}$ , then find the value of  
 $x^{100} + y^{100} + z^{100} - \frac{9}{x^{101} + y^{101} + z^{101}}$

**PHYSICS**

1. Two particles A and B having charges  $q$  and  $2q$  respectively are placed on a smooth table with a separation  $d$ . A third particle C is to be clamped on the table in such a way that the particles A and B remain at rest on the table under electrical forces. What should be the charge on C and where should it be clamped?
2. A particle of mass  $m$  and charge  $q$  is thrown at a speed  $u$  against a uniform electric field  $E$ . How much distance will it travel before coming to momentary rest?
3. A rod of length  $L$  has a total charge  $Q$  distributed uniformly along its length. It is bent in the shape of a semicircle. Find the magnitude of the electric field at the centre of curvature of the semicircle.

**BIOLOGY**

Q. 1. Differentiate between Geitonogamy and Xenogamy in plants. Which one between the two will lead to Inbreeding Depression and why?

Q. 2. The flower of brinjal is referred to as chasmogamous while that of beans is cleistogamous. How are they different from each other?

### CHEMISTRY

1. Define a solution. How is it different from a heterogeneous mixture?
2. What do you mean by molarity? Calculate the molarity of a solution containing 5 g of NaOH in 500 mL solution.

### PHYSICAL EDUCATION

1. What is Planning? Explain the objectives of planning in sports in detail.
2. Enlist the committees for organising sports events and explain them in detail.

### ENGLISH

1. Your school is organizing a workshop on Cyber Safety for students. Draft a notice inviting students to attend the workshop.
2. Think back over your past seven days of your summer vacation.

In your best **cursive handwriting**, write a diary entry (approx. 120–150 words) **week wise** describing how you spent your week.

**Include the following:**

- Where did you go and what were your main activities?
- Describe one thing you saw, heard, or felt that made the week memorable.
- How does these moments change the way you look back on your week?"

## WEEK – 2

### MATHEMATICS

1. Prove that  $\tan^{-1} \left( \frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}} \right) = \frac{\pi}{4} - \frac{1}{2} \cos^{-1} x^2$ .
2. Express  $\begin{bmatrix} 2 & 5 & 6 \\ 1 & 2 & 3 \\ -1 & 0 & 6 \end{bmatrix}$  as a sum of symmetric and skew symmetric matrix.

### PHYSICS

1. Consider a uniformly charged ring of radius R. Find the point on the axis where the electric field is maximum.
2. Consider a circular ring of radius r, uniformly charged with linear charge density  $\lambda$ . Find the electric potential at a point on the axis at a distance x from the centre of the ring. Using this expression for the potential, find the electric field at this point.
3. Two particles, carrying charges -q and +q and having equal masses m each, are fixed at the ends of a light rod of length a to form a dipole. The rod is clamped at an end and is placed in a uniform electric field E with the axis of the dipole along the electric field. The rod is slightly tilted and then released. Neglecting gravity find the time period of small oscillations.

### BIOLOGY

- Q. 1. Explain the male reproductive system with all parts and their functions in details with well labelled diagram.
- Q. 2. Give the summary of mensural cycle with all events with diagram.

### CHEMISTRY

1. Why do gases always tend to be less soluble in liquids at higher temperatures?
2. Define mole fraction. Calculate the mole fraction of ethanol in a solution containing 46 g ethanol and 54 g water.

### PHYSICAL EDUCATION

1. What is tournament? Explain the importance of tournament in detail.
2. Define and classify 'Fixture'. Draw a league fixture for 16 teams.
3. Write down the method of preparing fixture in knock-

### ENGLISH

1. You have lost your library card on the school premises. Write a notice for the school notice board.

2. Think back over your past seven days of your summer vacation.

In your best **cursive handwriting**, write a diary entry (approx. 120–150 words) week wise describing how you spent your week.

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### WEEK – 3

#### MATHEMATICS

1. Let L be the set of all lines in a plane and R be a relation on L defined by  $l_1 R l_2$  iff  $l_1$  is perpendicular to  $l_2$ , then R is equivalence relation or not.
2. Find the range of  $\sec^{-1}(2x - 1)$ .

#### PHYSICS

1. A charge is distributed uniformly over a ring of radius 'a'. Obtain an expression for the electric intensity E at a point on the axis of the ring. Hence show that for points at large distances from the ring, it behaves like a point charge.
2. A cube of side b has a charge q at each of its vertices. Determine the potential and electric field due to this charge array at the centre of the cube.

#### BIOLOGY

- Q. 1. Describe the pre-fertilisation and post-fertilisation events.
- Q. 2. Difference between oogenesis and spermatogenesis.
- Q. 3. Explain the medical termination of pregnancy (MTP).

#### CHEMISTRY

1. Explain the term **colligative properties**. Name any four examples.
2. What is abnormal molar mass? Give one reason for its occurrence.

#### PHYSICAL EDUCATION

1. Mention the causes, precautions and remedies of bow legs.
2. Suggest physical activities as corrective measures for flat foot and Lordosis.

#### ENGLISH

1. As the Secretary of the Music Club of your school, draft a notice inviting students to audition for the Annual Music Competition.
2. Think back over your past seven days of your summer vacation.

In your best **cursive handwriting**, write a diary entry (approx. 120–150 words) **week wise** describing how you spent your week.

## WEEK – 4

### MATHEMATICS

1. Determine the product of  $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$  and then use to solve the system of equations  $x - y + z = 4$   
 $x - 2y - 2z = 9$   
 $2x + y + 3z = 1$
2. If  $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$  find  $A^{-1}$ . Using  $A^{-1}$  solve the system of equation  
 $x + 2y + z = 4$   
 $-x + y + z = 0$   
 $x - 3y + z = 2$

### PHYSICS

1. A 200  $\mu\text{F}$  parallel plate capacitor having plate separation of 5 mm is charged by a 100 V dc source. It remains connected to the source. Using an insulated handle, the distance between the plates is doubled and a dielectric slab of thickness 5 mm and dielectric constant 10 is introduced between the plates. Explain with reason, how the (i) capacitance, (ii) electric field between the plates, (iii) energy density of the capacitor will change?
2. Two capacitors of unknown capacitances  $C_1$  and  $C_2$  are connected first in series and then in parallel across a battery of 100 V. If the energy stored in the two combinations is 0.045 J and 0.25 J respectively, determine the value of  $C_1$  and  $C_2$ . Also calculate the charge on each capacitor in parallel combination.

### BIOLOGY

Q. 1. what is sexually transmitted disease (STDs)? explain with suitable examples.

Q.2. Make a detailed Project on Reproductive Health , Pollination and their Agents , Female Reproductive Organ and their Functions.

### CHEMISTRY

1. Define osmotic pressure. How is it related to molar mass determination?
2. Calculate the depression in freezing point when 2 g of urea is dissolved in 100 g of water.

### PHYSICAL EDUCATION

1. Explain the causes, precautions and remedies of knock knees.
2. Explain scoliosis, its causes and suggest its preventive and remedial measures.

## ENGLISH

1. Write a letter to the editor expressing your concern over the rising cases of cybercrime.
2. Write an article on "The Role of Technology in Modern Education." 2. Write an article on "Fitness and Healthy Living in the Modern Age."
3. Think back over your past seven days of your summer vacation.

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## WEEK – 5

### MATHEMATICS

1. Show that function  $f : \mathbb{R} \rightarrow \mathbb{R}$ , defined by  $f(x) = \frac{x}{x^2+1}$  is neither one –one nor onto.
2. If  $A^2 = I$  then find  $(A + I)^3 + (A - I)^3 - 7A$

### PHYSICS

1. Two capacitors of capacitance  $10 \mu\text{F}$  and  $20 \mu\text{F}$  are connected in series with a  $6 \text{ V}$  battery. After the capacitors are fully charged, a slab of dielectric constant ( $K$ ) is inserted between the plates of the two capacitors. How will the following be affected after the slab is introduced:
  - (a) the electric field energy stored in the capacitors?
  - (b) the charges on the two capacitors?
  - (c) the potential difference between the plates of the capacitors? Justify your answer.
2. In a parallel plate capacitor with air between the plates, each plate has an area of  $5 \times 10^{-3} \text{ m}^2$  and the separation between the plates is  $2.5 \text{ mm}$ .
  - (i) Calculate the capacitance of the capacitor.
  - (ii) If this capacitor is connected to  $100 \text{ V}$  supply, what would be the charge on each plate?
  - (iii) How would charge on the plates be affected, if a  $2.5 \text{ mm}$  thick mica sheet of  $K = 8$  is inserted between the plates while the voltage supply remains connected?

### BIOLOGY

Q.1. Explain the female reproductive system with all parts and their functions in details with well labelled diagram.

Q. 2. State the significance of pollination. List any four differences between wind pollinated and animal pollinated flowers.

### CHEMISTRY

Q1. What is **Henry's Law**? Write its mathematical expression.

Q2. State **Raoult's Law** for a non-volatile solute.

### PHYSICAL EDUCATION

1. Explain knock knees, its causes, precautions and remedial exercises.

### ENGLISH

1. Write a report for your school magazine about the Swachh Bharat Abhiyan drive carried out in your school.

2. Prepare the topic of your choice for ASL (Assessment of Speaking and Listening) and Prepare your ASL Project file.

3. Think back over your past seven days of your summer vacation.

In your best **cursive handwriting**, write a diary entry (approx. 120–150 words) week wise describing how you spent your week.

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### PROJECT WORK

Roll No	Subject	Suggested Investigatory projects	Roll No	Subject	Projects
5,9,21	Physics	To study various factors on which the internal resistance/EMF of a cell depends.	1-24	English	Make a project file based on any chapter or poetry from the Book Flamingo and Vistas (Done till now)
	Chemistry	Study of the presence of oxalate ions in guava fruit at different stages of ripening.			
	Phy Ed	Diabetes			
6,10,22	Physics	To study the variations in current flowing in a circuit containing an LDR because of a variation in (a) the power of the incandescent lamp, used to 'illuminate' the LDR (keeping all the lamps at a fixed distance). (b) the distance of an incandescent lamp (of fixed power) used to 'illuminate' the LDR.	1-24	Maths	Do Lab Activities : Activity1. To verify for the Equivalent relation: a) Let L be the set of all lines in a plane and R be a relation on L defined by $l_1 R l_2$ iff $l_1$ is perpendicular to $l_2$ . b) Let L be the set of all lines in a plane and R be a relation on L defined by $l_1 R l_2$ iff $l_1$ is parallel to $l_2$ .  Activity:2 To demonstrate the concept of One One and Onto functions.
	Chemistry	Study of quantity of casein present in different samples of milk.			
	Phy Ed	Asthma			
7,11,23	Physics	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.			
	Chemistry	Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.			
	Phy Ed	hypertension			

8,12,24	Physics	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.			
	Chemistry	Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)			
	Phy Ed	Back pain			
1,13,17	Physics	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.			
	Chemistry	Study of digestion of starch by salivary amylase and effect of pH and temperature on it.			
	Phy Ed	Arthritis			
2,14,18,	Physics	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.			
	Chemistry	Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.			
	Phy Ed	Diabetes			
3,15,19	Physics	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.			

	Chemistry	Extraction of essential oils present in Saunf (aniseed), Ajwain (carom), Illaichi (cardamom).			
	Phy Ed	Asthma			
4,16,20	Physics	To study the earth's magnetic field using a compass needle - bar magnet by plotting magnetic field lines and tangent galvanometer.			
	Chemistry	Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chili powder and pepper.			
	Phy Ed	hypertension			

**WORKING MODELS** (only one as per the interest)

Roll No.	Subject	Suggested topics
5,9,21	Physics Or Chemistry Or Biology	Transformers Or Electrolysis of water Or Animal cell
6,10,22	Physics Or Chemistry Or Biology	Telescope Or Water quality checker Or Plant cell
7,11,23	Physics Or Chemistry Or Biology	Half wave or full wave rectifier Or Atomic structure(model) Or Human digestive system
8,12,24	Physics Or Chemistry Or Biology	AC generator Or Lemon battery experiment Or Human respiratory system
1,13,17	Physics Or Chemistry Or Biology	Electromagnetic induction Or Cathode ray tube Or Human excretory system
2,14,18,	Physics Or	Magnetic Effects of Current and Magnetism Or

	Chemistry Or Biology	Electroplating Or Human brain
3,15,19	Physics Or Chemistry Or Biology	Capacitors Or Purification of H <sub>2</sub> O Or Human heart
4,16,20	Physics Or Chemistry Or Biology	Interference or diffraction Or Periodic table Or Hemodialysis working model

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