

MDS PUBLIC SCHOOL , MADINA
SESSION – 2025-26
CLASS – 12TH
SUMMER VACATION HOMEWORK



The summer days are back again!! And its vacation time again! There's sun and shade And water to wade Time for some fun and frolic With ice creams to lick Activities to indulge in Places to explore Yes!! It's vacation time again!!!

Dear Parents

We believe children are natural learners and have an innate curiosity. They take pleasure in discovery. Hence, we have made an endeavour to induce and enhance thinking skills in them by making them be actively doing things for themselves. Through a lot of physical activity, movement, exploring and first-hand learning by doing things on their own, we facilitate that their learning goes into their long-term memory. We are sure you are there with us in this endeavour of ours.

Dear Students

Summer vacation is that time of the year when we have the time of our life. We relax, spend time with our family and friends and visit places galore. It's also the time to explore our talents, learn new skills and engage in different activities. Some suggestions to make the summer break time more special and exciting for you.

1. Learn a new sport or skill and engage in physical activities.
2. Learn dignity of labour by doing things yourself.
3. Plant a sapling and take care of it.
4. Spend quality time with your family members.

GENERAL INSTRUCTIONS:

1. Complete the holiday homework of all the subjects in the holidays homework notebook in neat and clear Handwriting.
2. Holiday Homework will be a part of Internal Assessment. It must be done properly according to the instructions given by the teachers. Beautiful and systematic work will carry extra marks.
3. After summer vacation, the Summer Holiday Homework Notebook/Scrapbook/Project File/Lab Manuals (which-ever applicable) must be submitted in the School for Internal Assessment.
4. Parents kindly make sure your wards complete all the work assigned. Work to be done on regular basis.

Wishing every child, constructive holidays!

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ARTIFICIAL INTELLIGENCE :

- Revise all chapters done in class .
- Do model test papers given at last of the book.
- Do the given questions :
 - I . Write the three components that make up a good story.
 - II. What do you mean by storytelling ? What is the need for storytelling ?
 - III. How can you ensure active listening ?
 - IV. Define motivation. Explain the different types of motivation with the help of examples.
 - V. Explain the acronym 'SMART' with respect to goal setting.
 - VI. Explain the acronym 'OCEAN' with respect to personality traits.
 - VII. Explain various types of data stories. What are the different ways to tell your stories ?
 - VIII. Differentiate the following :
 - a) Sum() and Average()
 - b) Function and Formula
 - c) Sorting and Filtering
 - d) Workbook and Worksheet
 - IX. What are personality disorder ? Write about 4 such personality disorder.
 - X. What is Artificial Intelligence (AI)? Explain its importance and applications.
 - XI. What is the difference between Narrow AI and General AI? Provide examples for both.
 - XII. Explain the different types of learning in AI.
 - XIII. What is Natural Language Processing (NLP)? Discuss its applications in real life.
 - XIV. What do you understand by the term "Machine Learning"? How is it different from AI?
 - XV. What is the K-Nearest Neighbours (KNN) algorithm? How does it work in classification tasks?
 - XVI. Explain the concept of Naive Bayes classifier. How is it used in spam email detection?
 - XVII. What is the difference between linear regression and logistic regression in machine learning?
 - XVIII. What is the significance of cross-validation in evaluating machine learning models?

English :

Section A: Writing Skills

1. Formal & Informal Invitations with Replies

A. Design a creative invitation (choose any one):

- ❖ The inauguration of your school's Annual Art Exhibition
- ❖ Your elder sister's wedding
- ❖ A book launched by a famous author in your city

Include: Name, host, occasion, date/time, venue, RSVP

B. Write any two replies:

- ❖ Formal reply (Accepting) to a school function invitation

- ❖ Informal reply (Declining) to a birthday party

2. Job Application Practice

Write one job application with biodata from the options below:

- ❖ English teacher in a reputed CBSE school
- ❖ Content writer at an educational website
- ❖ Assistant Editor for a student magazine

Section B: Literature Revision

FLAMINGO – Prose

Answer the following in 100–120 words each:

1. The Last Lesson:

What changes did Franz notice in the school that day? What was the significance of those changes?

2. Lost Spring:

How is Saheb's life different from that of the children in Seemapuri?

3. Deep Water:

How did the instructor help Douglas overcome his fear of water?

FLAMINGO – Poetry

Answer the following in 40–50 words each:

1. My Mother at Sixty-six:

How does the poet use imagery to express the pain of separation?

2. A Thing of Beauty:

What makes a thing of beauty a joy forever? How does it help us cope with life?

3. Keeping Quiet:

What is the significance of counting to twelve and keeping still?

VISTAS – Supplementary Reader

Answer the following in about 100–120 words:

1. The Third Level:

What does Charley's experience on the third level tell us about his state of mind?

2. The Tiger King:

How does the story reflect satire on the pride and arrogance of rulers?

3. Journey to the End of the Earth:

Why does the author call Antarctica 'a place to go to understand the Earth's past, present and future'?

Instructions for Students:

- ❖ Use one notebook or folder for all work.
- ❖ Write neatly and label each section clearly.
- ❖ Highlight headings and use color if you wish to make it presentable.
- ❖ Original thinking and creativity will be appreciated!

BIOLOGY :

- Solve all intext and exercise Q/A of following chapters:
chapter- 4 (Principles of Inheritance and Variations)
chapter -5 (Molecular basis of Inheritance)

A. To prepare project of 35-40 pages on the topic already discussed

It should include:

- Cover page
- Index
- Acknowledgement
- Certificate
- Introduction
- Details about the project
- Annexure
- Bibliography

B. Practice questions

1. Draw a labelled diagram of DNA molecule.
2. Give an outline of steps involved in DNA fingerprinting.
3. In E. Coli, 3 enzymes β galactosidase, permease & transacetylase began to be produced as soon as lactose was added. Explain why did the enzyme not form in the absence of lactose?
4. Does each of the 2 complementary strands of DNA carry the same biological message?
5. Differentiate between following.
 - * Repetitive DNA and satellite DNA
 - * mRNA & tRNA
 - * Template strand & coding strand
6. The core RNA polymerase is capable of catalysing which steps of transcription-
 - a) Initiation only
 - b) Elongation only
 - c) Termination only
 - d) All of these
7. In most prokaryotes the transcription unit is :
 - a) Mono-cistronic
 - b) Poly-cistronic
 - c) Multi-cistronic
 - d) Uni-cistronic
8. The lactose present in the growth medium of bacteria is transported to the cell by the action of-
 - a) Beta-galactosidase
 - b) Acetylase
 - c) Permease
 - d) Polymerase
9. A transcription unit in DNA is defined primarily by the three regions in DNA and these are with respect to upstream and down stream end;
 - a) Repressor, Operator gene, Structural gene
 - b) Structural gene, Transposons, Operator gene
 - c) Inducer, Repressor, Structural gene
 - d) Promotor, Structural gene, Terminator
10. Which of the following statement is correct regarding the process of replication in E.coli ?
 - a) The DNA dependent DNA polymerase catalyses polymerization in one direction that is $3' \rightarrow 5'$
 - b) The DNA dependent RNA polymerase catalyses polymerization in one direction, that is $5' \rightarrow 3'$
 - c) The DNA dependent DNA polymerase catalyses polymerization in $5' \rightarrow 3'$ as well as $3' \rightarrow 5'$ direction
 - d) The DNA dependent DNA polymerase catalyses polymerization in $5' \rightarrow 3'$ direction
11. The last chromosome sequenced in Human Genome Project was:
 - a) Chromosome 6
 - b) Chromosome 1

12. Which scientist conducted an experiment with ^{32}P and ^{35}S labelled phases for demonstrating that DNA is the genetic material?

- a) James D. Watson and F.H. C. Crick b) A.D Hershey and M.J. Chase
c) F. Griffith d) O.T. Avery, C.M. MacLeod and M. McCarty

13. Unequivocal proof that DNA is the genetic material was first proposed by

- a) Alfred Hershey and Martha Chase b) Avery, Macleoid and McCarthy
c) Wilkins and Franklin d) Frederick Griffith

14. What is the role of RNA polymerase III in the process of transcription in Eukaryotes?

- a) Transcription of tRNA, 5S rRNA and snRNA
b) Transcription of precursor of mRNA
c) Transcription of only snRNAs
d) Transcription of rRNAs (28S, 18S and 5.8S)

15. Upon exposure to UV radiation, DNA stained with ethidium bromide will show

- a) Bright blue colour b) Bright yellow colour
c) Bright orange colour d) Bright red colour

16. In lac operon, z gene codes for

- a) Transacetylase b) B-galactosidase
c) Permease d) Repressor

17. Against the codon 5' UAC 3', what would be the sequence of anticodon on tRNA?

- a) 5' GUA 3' b) 5' AUG 3' c) 5' ATG 3' d) 5' GTA 3'

18. If A and C make 30% and 20% of DNA, respectively, what will be the percentage composition of T and G?

- a) T : 20%, G : 20% b) T : 20%, G : 30% c) T : 30%, G : 20% d) T : 30%, G : 30%

19. The process of translation of mRNA to proteins begins as soon as:

- a) The small subunit of ribosome encounters mRNA
b) The larger subunit of ribosome encounters mRNA
c) Both the subunits join together to bind with mRNA
d) The t RNA is activated and the larger subunit of ribosome encounters mRNA

20. DNA polymorphism forms the basis of:

- a) Genetic mapping
b) DNA finger printing
c) Both genetic mapping and DNA finger printing
d) Translation

Chemistry :

- Solve all intext and exercise Q/A of following units:
- Unit -6 (Haloalkane & Haloarene)
- Unit -7 (Alcohol, Phenol & Ether)

Project work

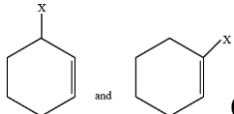
- Make investigatory project on assigned topics :
- **Aditya, Naman** - Raoult's law
- **Anu, Archana** - Primary and Secondary cells
- **Badal, Sourabh**- Integrated rate equations for zero and first order reactions
- **Dimple, Vanshika** - Nucleophilic substitution reaction mechanism (SN^1 & SN^2)
- **Himanshi, Sakshi** - Crystal field theory for tetrahedral and octahedral complexes
- **Nainsi, Tannu**- Aldol & Cross Aldol condensation reaction

- **Riya, Santosh** - Glucose Structure
- **Ritik, Sittu, Karan** - Arrhenius and Collision theory

Assignment -1

Unit - 6 (Haloalkane and Haloarene)

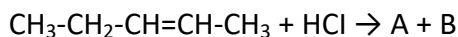
- Write the structure of isomers of compound C_4H_9Br . Which is more reactive towards SN^1 mechanism?
- Write the IUPAC name of the following compound :

$$\begin{array}{c}
 H_3C - C = C - CH_2 - OH \\
 | \quad | \\
 CH_3 \quad Br
 \end{array}$$
- 

Out of which is an example of allylic halide ?
- The following compounds are given to you :
 2-Bromopentane, 2-Bromo-2-methylbutane, 1-Bromopentane
 - Write the compound which is most reactive towards SN^2 reaction.
 - Write the compound which is optically active.
 - Write the compound which is most reactive towards the -elimination reaction.
- Out of $(CH_3)_3C-Br$ and $(CH_3)_3C-I$, which one is more reactive towards SN^1 and why ?
- Why dextro and laevo – rotatory isomers of Butan-2-ol are difficult to separate by fractional distillation ?
- Predict the stereochemistry of the product formed if an optically active alkyl halide undergoes substitution reaction by SN^1 mechanism.
- Name the instrument used for measuring the angle by which the plane polarised light is rotated.
- Predict the major product formed when 2-Bromopentane reacts with alcoholic KOH.
- Give one use of CHI_3 .
- Write the structures of the products formed when anisole is treated with HI.
- What happens Benzene is treated with CH_3COCl in presence of anhydrous $AlCl_3$?
- Write down balanced chemical equations for following name reactions ?
 - Friedel craft alkylation reaction
 - Swarts reaction
- Out of o-and p-dibromobenzene which one has a higher melting point and why?
- Which of the compounds will react faster in SN^1 reaction with the “OH” ion?
 CH_3-CH_2-Cl or $C_6H_5-CH_2-Cl$
- Compound ‘A’ with the molecular formula C_4H_9Br is treated with aq. KOH solution. The rate of this reaction depends upon the concentration of the compound ‘A’ only. When another optically active isomer ‘B’ of this compound was treated with aq.KOH solution, the rate of reaction was found to be dependent on concentration of compound and KOH both.
 - Write down the structural formula of both compounds ‘A’ and ‘B’.
 - Out of these two compounds, which one will be converted to the product with

inverted configuration?

17. Identify the products A and B formed in the following reaction



18. Write a test to detect the presence of a double bond in a molecule.

Assignment -2

Unit - 3 (Chemical Kinetics)

1.The term – $\frac{dx}{dt}$ in a rate equation refers to :

- (a) the conc. of a reactant
- (b) the decrease in conc. of the reactant with time
- (c) the velocity constant of reaction
- (d) None of these

2.For a reaction $\text{P} + \text{Q} \rightarrow 2 \text{R} + \text{S}$, the incorrect statement is

- (a) Rate of disappearance of P = Rate of appearance of S
- (b) Rate of disappearance of Q = 2 x Rate of appearance of R
- (c) Rate of disappearance of Q = Rate of disappearance of P
- (d) Rate of disappearance of Q = $\frac{1}{2}$ x Rate of appearance of R

3. In a reaction, $2\text{X} \rightarrow \text{Y}$, the concentration of X decreases from 0.50 M to 0.38 M in 10 min.

What is the rate of reaction in Ms^{-1} during this interval?

- (a) 2×10^{-4}
- (b) 4×10^{-2}
- (c) 2×10^{-2}
- (d) 1×10^{-2}

4.Instantaneous rate of a chemical reaction is

- (a) rate of reaction in the beginning
- (b) rate of reaction at the end
- (c) rate of reaction at a given instant
- (d) rate of reaction between two specific time intervals

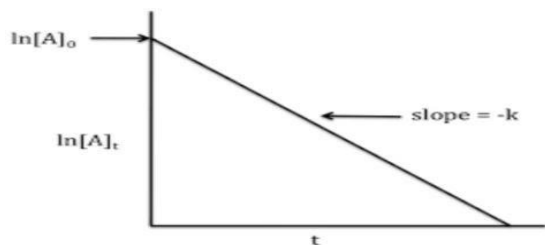
5. A first order reaction has a rate constant $1.15 \times 10^{-3} \text{s}^{-1}$. Time taken for 5 g of this reactant to reduce to 3 g is

- (a) 444 s
- (b) 400 s
- (c) 528 s
- (d) 669 s

6. Order of reaction is decided by

- (a) temperature
- (b) mechanism of reaction as well as relative concentration of reactants
- (c) molecularity
- (d) pressure

7. A plot is shown below between concentration and time t. Which of the given orders is indicated by the graph



- (a) Zero Order (b) Second Order (c) First Order (d) Fractional Order

8. A zero order reaction is one whose rate is independent of

- (a) the concentration of the reactants
 (b) the temperature of reaction
 (c) the concentration of the product
 (d) the material of the vessel in which reaction is carried out

9. A catalyst increases the reaction rate by:

- (a) decreasing enthalpy (b) increasing internal energy
 (c) decreasing activation enthalpy (d) increasing activation enthalpy

10. A first order reaction takes 40 min for 30% decomposition. $t_{1/2}$ will be

- (a) 77.7 min (b) 52.5 min (c) 46.2 min (d) 22.7 min

11. In a reaction, the threshold energy is equal to

- (a) activation energy + normal energy of reactants
 (b) activation energy - normal energy of reactants
 (c) normal energy of reactants - activation energy
 (d) average kinetic energy of molecules of reactants

12. Which of the following influences the reaction rate performed in a solution?

- (a) Temperature (b) Activation energy
 (c) Catalyst (d) All of the above

13. An endothermic reaction with high activation energy for the forward reaction is given by the diagram.



14. The half life of the first order reaction having rate constant $K = 1.7 \times 10^{-5} \text{ s}^{-1}$ is

- (a) 12.1 h (b) 9.7 h (c) 11.3 h (d) 1.8 h

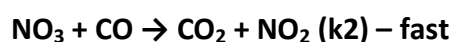
15. For a chemical reaction $A \rightarrow B$, it is found that the rate of reaction doubles when the concentration of A is increased four times. The order of reaction is

- (a) Two (b) One (c) Half (d) Zero

16. For a second-order reaction, what is the unit of the rate of the reaction?

- a) s^{-1} b) $\text{mol L}^{-1} s^{-1}$ c) $\text{mol}^{-1} \text{L s}^{-1}$ d) $\text{mol}^{-2} \text{L}^2 s^{-1}$

17. The reaction $\text{NO}_2 + \text{CO} \rightarrow \text{NO} + \text{CO}_2$ takes place in two steps. Find the rate law.



- a) $R = k_1 [\text{NO}_2]^3$ b) $R = k_2 [\text{NO}_3] [\text{CO}]$ c) $R = k_1 [\text{NO}_2]$ d) $R = k_1 [\text{NO}_2]^2$

18. Which of the following reactions is an example of a fractional order reaction?

- (a) $\text{NH}_4\text{NO}_2 \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$ (b) $\text{NO} + \text{O}_3 \rightarrow \text{NO}_2 + \text{O}_2$
(c) $2\text{NO} + \text{Br}_2 \rightarrow 2\text{NOBr}$ (d) $\text{CH}_3\text{CHO} \rightarrow \text{CH}_4 + \text{CO}$

19. A reaction's rate constant is determined by

- (a) temperature of the reaction (b) extent of the reaction
(c) initial concentration of the reactants (d) the time of completion of reaction

20. For a given rate, the unit of rate and the rate constant are the same.

- (a) zero order reaction (b) first order reaction
(c) second order reaction (d) third order reaction

PHYSICS -

1. Activity – Make mind map of all formulas of Unit 1, 2 and 3 in your fair note book.

2. Make a model on one of the following topics-

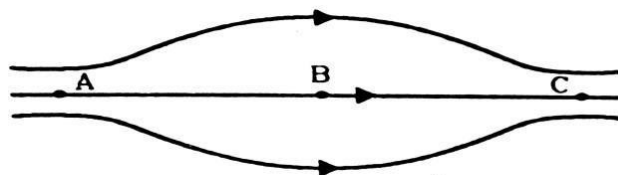
- a) EMI
b) Reflection of light
c) Refraction of light

3. Solve the following assignments.

ASSIGNMENT -1 ELECTRIC CHARGES AND FIELDS

1. Define electric dipole moment . Is it a scalar or a vector ? Derive the expression for the electric field of a dipole at a point on the equatorial line of the dipole .
2. State Gauss theorem . Using Gauss's law deduce the expression for the electric field due to a uniformly charged spherical conducting shell of radius R at a point (i) outside & (ii) inside the shell . Plot a graph showing variation of electric field as a function of $r > R$ and $r < R$ (r being the distance from the centre of the shell) .
- 3 .(a) Define electric flux . Write its S.I . unit .

- (b) Using Gauss's law ,prove that the electric field at a point due to a uniformly charged infinite plane sheet is independent of the distance from it .
- (c) How is the field directed if (i) the sheet is positively charged (ii)negatively charged ?
4. (a) Derive an expression for the torque experienced by an electric dipole kept in a uniform electric field . When is this torque maximum.
- 5 . Sketch the electric lines of force of
- a point charge $q > 0$,
 - a point charge $q < 0$,
 - an electric dipole or two equal & opposite charges separated by a small distance
 - two equal positive charges placed small distance apart in air ,
6. What is meant by quantisation of electric charge ?
7. Define dielectric constant of a medium in terms of force between electric charges .
8. An infinite line charge produces a field of $9 \times 10^4 \text{ N/C}$ at a distance of 4cm. Calculate the linear charge density.
9. Two infinite parallel plane thin sheets have uniform charge densities of σ_1 and σ_2 . Determine the electric field at points
- to the left of the sheets
 - between them
 - to the right of the sheets.
- 10 . Is the force acting between two point electric charges q_1 and q_2 kept at some distance in air, attractive or repulsive when :
- $q_1 q_2 > 0$
 - $q_1 q_2 < 0$
11. An electric dipole of dipole moment $20\mu\text{C}$ is enclosed by closed surface. What is the net electric flux coming out of this surface ?
- 12 .1 C of charge is equal to charge of 'n' number of electrons in magnitude. What is the value of 'n'?
13. The distance of the field point , on the equatorial plane of a small electric dipole is halved . By what factor does the electric field due to the dipole change ?
14. . Fig . shows some of the electric field lines corresponding to an electric field .The electric field at which point is minimum.



15. An electrostatic field line is a continuous curve. That is a field line cannot have sudden breaks. Why not?
16. Explain why two Electric field lines never cross each other at any point.
17. Three equal charges, each having a magnitude of $2.0 \times 10^{-6} \text{ C}$, are placed at the three corners of a right -angled triangle of sides 3cm,4cm and 5cm.Find the force on the charge at the right- angle corner.
- 18.Three charges ,each equal to q , are placed at the three corners of a square of side 'a' . Find the electric field at the fourth corner.
19. A glass rod when rubbed with silk cloth, acquires a charge of $1.6 \times 10^{-13} \text{ C}$. What is the charge on silk cloth ?
20. Two charges q and $-3q$ are placed fixed on x-axis separated by distance 'd'. Where should a third charge $2q$ be placed such that it will not experience any

force?

21. A point charge causes an electric flux $-3 \times 10^{-14} \text{ Nm}^2/\text{C}$ to pass through a spherical Gaussian surface .

(a) Calculate the value of the point charge .

(b) If the radius of the Gaussian surface is double , how much flux would pass through the surface ?

22. Fill in the blanks:

(i) Two spheres of equal radii have charges q and $3q$. The ratio of their surface charge densities is _____ .

(ii) Net electric field inside the charged spherical shell is _____ .

(iii) Electric flux is a _____ quantity and its SI unit is _____ .

(iv) The force of repulsion between two positive charges of 1C each, kept 1m apart in vacuum , is _____ .

(v) In a uniform electric field, an electric dipole experiences no net _____ but a non-zero _____

ASSIGNMENT 2 (ELECTROSTATIC POTENTIAL & CAPACITANCE)

1. Draw graphs showing the variations of

I. Electrostatic potential V with distance ' r ' for a charge q

II. Electrostatic field E with distance ' r ' for a charge q

2 . Show that the electric field at any point is equal to the negative of the potential gradient at that point .

3 . What is an equipotential surface ? Give an example .

4 . Sketch equipotential surfaces for

I. A positive point charge

II. A uniform electric field

5 . Show that the amount of work done in moving a test charge over an equipotential surface is zero

6 . Show that the direction of the electric field is normal to the equipotential surface at every point .

7. Fill in the blanks:

I. The electric potential of a point charge is _____ symmetric.

II. Electric potential is _____ quantity while potential gradient is a _____ quantity.

III. At a point is equal to the negative of the potential gradient at that point.

IV. The potential energy of two like charges is _____ .

V. For a constant electric field in the z -direction , equipotential surfaces will be planes parallel to _____.

8. How much is the electric potential of a charge at a point at infinity?

9. The work done in moving a charge of 3 Coulomb between two points is 6 J . What is the potential difference between the two points?

10. The electric potential at 0.9 m from a point charge is $+50 \text{ V}$. What is the magnitude and sign of the charge.

11. Derive an expression for the potential at a point along the axial line of a short dipole.

12. Derive an expression for the electric potential at a distance ' r ' from a point charge ' q '.

13. Derive an expression for the potential energy of a dipole rotated in a uniform

electric field.

14. Deduce expressions for the potential energy of a system of two point charges and three point charges and hence generalise the result for a system of 'N' point charges.
15. Two point charges $+10\mu\text{C}$ and $-10\mu\text{C}$ are separated by a distance of 2.0 cm in air. Calculate the potential energy of the system.
16. Deduce the expression for the capacitance of a parallel plate capacitor when a dielectric slab is inserted between the plates. Assume the slab thickness less than the plate separation.
17. Two capacitors of equal capacitance when connected in series have net capacitance C_1 and when connected in parallel have net capacitance C_2 . What is the value of C_1/C_2 ?
18. Sketch a graph to show how the charge Q acquired by a capacitor of capacitance C varies with increase in potential difference between its plates.
19. Why does the electric field inside a dielectric decrease when it is placed in an external electric field?
20. A parallel plate capacitor of capacitance C is charged to a potential V by a battery. Without disconnecting the battery, the distance between the plates is tripled and a dielectric medium of $k = 10$ is introduced between the plates of the capacitor. Explain giving reasons, how will the following be affected :
 - (i) capacitance of the capacitor
 - (ii) charge on the capacitor
 - (iii) energy density of the capacitor.

Assignment - 3

1. The susceptibility of a magnetic material is 1.9×10^{-5} . Name the type of magnetic materials it represents.
2. Where on the surface of Earth is the angle of dip zero?
3. Where on the surface of Earth is the horizontal component of Earth's magnetic field zero?
4. What is the magnetic dipole moment associated with an electron due to its orbital motion in the first orbit of H-atom known as?
5. What type of magnetic material is used in making permanent magnets?
6. Magnetic field arises due to charges in motion. Can a system have magnetic moments even though its net charge is zero?
7. How does the (i) pole strength and (ii) magnetic moment of each part of a bar magnet change if it is cut into two equal pieces along its length?
8. Derive an expression for the potential energy of a magnetic dipole in a uniform magnetic field.
9. Relative permeability of a material $\mu_r = 400$. Identify the nature of the magnetic material.
10. Draw magnetic field lines when a
 - (i) diamagnetic,
 - (ii) paramagnetic substance is placed in an external magnetic field.Which magnetic property distinguishes this behaviour of the field lines due to the two substances?

Assignment - 4

1. (a) How does a diamagnetic material behave when it is cooled to very low temperatures?
(b) Why does a paramagnetic sample display greater magnetisation when cooled? Explain.
2. A short bar magnet of magnetic moment $m = 0.32 \text{ JT}^{-1}$ is placed in a uniform magnetic field of 0.15 T. If the bar is free to rotate in the plane of the field, which

- orientation would correspond to its (a) stable, and (b) unstable equilibrium? What is the potential energy of the magnet in each case?
3. A closely wound solenoid of 800 turns and an area of cross-section $2.5 \times 10^{-4} \text{ m}^2$ carries a current of 3.0 A. Explain the sense in which the solenoid acts like a bar magnet. What is its associated magnetic moment ?
 4. A long solid steel pipe carries a 5 ampere direct current. The magnetic field associated with the current will be
 - (a) Only inside the pipe
 - (b) Only outside the pipe
 - (c) neither inside nor outside the pipe
 - (d) Both inside and outside the pipe
 5. If a particle is moving in a uniform magnetic field, then
 - (a) Its momentum changes but total energy remains same
 - (b) Both momentum and total energy remains the same
 - (c) its total energy changes but momentum remains same
 - (d) Both momentum and total energy will change
 6. To convert a galvanometer into an ammeter, we connect
 - (a) High resistance in series
 - (b) High resistance in parallel
 - (c) low resistance in parallel
 - (d) Low resistance in series
 7. An electron is projected with uniform velocity along the axis of a current carrying long solenoid. Which of the following is true?
 - (a) The electron will be accelerated along the axis.
 - (b) The electron path will be circular about the axis.
 - (c) The electron will experience a force at 45° to the axis and hence execute a helical path.
 - (d) The electron will continue to move with uniform velocity along the axis of the solenoid.

History –

Instructions:**

- ❖ Use neat handwriting and organize content clearly.
- ❖ Include relevant dates, pictures, maps, and sources.
- ❖ Submit in a file or notebook format

SECTION -A:

Chapter-Based Questions (Theory Work)

- 1) Choose any 3 chapters from your textbook and answer the following for each chapter :
 1. Write a summary of the chapter in 150–200 words.
2. Answer the following questions (80–100 words each):
 - 1) What are the key historical sources used in this chapter?
 - 2) Mention any two major events or debates discussed.
 - 3) How does this chapter reflect continuity and change in Indian history?

Recommended Chapters:

- 1) Bricks, Beads and Bones
- 2) Kings, Farmers and Towns

- 3) Mahatma Gandhi and the Nationalist Movement
- 4) Colonialism and the Countryside
- 5) Peasants, Zamindars and the State

SECTION –B

Source-Based Practice

Choose any two sources from your textbook and :

1. Identify the type of source (archaeological, textual, etc.)
2. What information does the source provide?
3. How can historians interpret this source differently?

(Answer each in 100–150 words)

SECTION - C

Creative Activity

Option 1: Make a timeline chart (on A3/chart paper) of significant historical events from 600 BCE to 1947 CE.

Option 2: Create an illustrated biography of any one historical figure (Ashoka, Akbar, Gandhi, etc.) including:

- ❖ Early life
- ❖ Key contributions
- ❖ Impact on Indian society
- ❖ Visuals, quotes, and timeline.

SECTION - D

Project Work (As per CBSE Guidelines)

Requires one project (15–20 pages) for assessment.

Choose one topic from the following :

1. Partition of India – Causes, Impact, Personal accounts
2. Tribal Resistance Movements
3. Development of Indian Art and Architecture (Ancient/Medieval)
4. Bhakti or Sufi Movement – Social and Cultural impact
5. Mahatma Gandhi and the Freedom Struggle.

Include :

Cover Page & Index

Introduction

Research Content with visuals/maps

Conclusion

Bibliography

Bonus:

Students are encouraged to watch history documentaries or films like The Story of India (BBC), Gandhi, or Mohenjo Daro and write a short reflection (100–150 words) on historical accuracy

Geography –

Instructions:

- ❖ Use maps, charts, and visuals to enhance presentation.
- ❖ Submit your work in a project file or notebook.
- ❖ Work must be handwritten unless instructed otherwise.

SECTION A: Theory Work (Short Notes)

Prepare brief notes (150–200 words) on the following topics from India: People and Economy:

1. Human Development Index – Indicators and importance

2. Factors affecting population distribution in India
3. Types of migration and their causes in India
4. Land degradation and measures for conservation
5. Urban waste disposal – problems and solutions

SECTION B: Map Work

On a political map of India, locate and label the following:

1. Soil types – Alluvial, Black, Red, Laterite, Arid, and Forest
2. Irrigation projects – Bhakra Nangal, Hirakud, Nagarjuna Sagar, Indira Gandhi Canal
3. Major industrial regions – Mumbai-Pune, Chota Nagpur, Bengaluru-Tamil Nadu
4. Population density – Mark five most densely populated states
5. Major crops – Rice, Wheat, Sugarcane, Cotton, Tea

SECTION C: Project Work (CBSE Prescribed)

Choose one topic as per CBSE guidelines for your final practical exam (15–20 pages) :

Suggested Topics:

1. Land Resource Management
2. Impact of Mining on Environment
3. Natural Disasters in India (Case Study Based)
4. Tourism and its Impact on Local Economy and Environment
5. Transport and Communication – A Lifeline of National Integration

Project must include:

- ❖ Cover Page & Index
- ❖ Introduction
- ❖ Objectives
- ❖ Case Studies (if applicable)
- ❖ Maps, Diagrams, Charts
- ❖ Conclusion & Bibliography

SECTION - D

Activity (Creative Task)

- ❖ Design an awareness poster or infographic on sustainable development or water conservation.
- ❖ Use A4 size sheet or chart paper. Digital entries are also allowed (with prior permission).

Note: Marks will be awarded for content, creativity, effort, and punctuality.

Political Science –

Section – A

Make a project file or PowerPoint presentation on any ONE of the following topics:

1. Cold War Era: Trace the major events and how the world was divided into two blocs.
2. United Nations and Its Organs: Focus on its relevance in the 21st century.
3. India's Foreign Policy: Evolution since independence and key challenges.
4. Political Parties in India: Role in shaping Indian democracy.

Note : Use pictures, facts, data, and timelines to make your project engaging.

Section – B

Map Work (On A4 Map Sheets)

Mark the following :

1. Major members of NATO and Warsaw Pact during the Cold War.
2. SAARC countries.
3. Non-Aligned Movement leaders' countries (e.g., India, Yugoslavia, Egypt).

Section - C

Creative Task

Write a letter as a political leader (real or imaginary) during the Cold War explaining your country's stance on being aligned or non-aligned.

Section - D

Current Affairs Task

Collect and summarize 5 political events that happened recently (national or international). Mention the date, place, people involved, and political impact.

हिंदी :

- (1) कक्षा में की गई सभी कविताओं की दोहराई करें, प्रत्येक कविता से दस-दस आंतरिक प्रश्न छाँटकर लिखें।
- (2) निम्नलिखित में से एक विषय पर परियोजना फाइल तैयार करें :
 - ❖ हरिवंश राय बच्चन
 - ❖ जैनेंद्र कुमार
 - ❖ तुलसीदास
- (3) यमुना बचाओ पर एक रिपोर्ट लिखें |
- (4) बाजारवाद और उपभोक्तावाद के युग में बाजार के जादुई प्रभाव से बचने के लिए एक चित्रात्मक परियोजना तैयार करें |
- (5) भूकंप पर एक फीचर या आरेख तैयार करें |
- (6) विद्यालय में आयोजित कार्यक्रम / वार्षिक समारोह के विषय में एक नोट लिखें |
- (7) हाल ही में हुई पहलगाम घटना के पीछे के कारण का पता लगाएं और एक रिपोर्ट तैयार करें।

Physical Education :

- Learn ch 3 , 4 and 5.
- Make a 400 meter standard track on chart.
- Make chart of one individual game.

Competitive Corner

Physics

Assignment 1

1. What is the charge acquired by a body when 1 million electrons are transferred to it?
2. An attractive force of 5N is acting between two charges of $+2.0 \mu\text{C}$ & $-2.0 \mu\text{C}$ placed at some distance. If the charges are mutually touched and placed again at the same distance, what will be the new force between them?
3. A charge of $+3.0 \times 10^{-6} \text{ C}$ is 0.25 m away from a charge of $-6.0 \times 10^{-6} \text{ C}$.
 - a. What is the force on the $3.0 \times 10^{-6} \text{ C}$ charge?

- b. What is the force on the $-6.0 \times 10^{-6} \text{ C}$ charge?
4. An electric dipole consists of a positive and a negative charge of $4\mu\text{C}$ each placed at a distance of 5mm . Calculate dipole moment.
5. Three capacitors of capacitances $2\mu\text{F}$, $3\mu\text{F}$ and $4\mu\text{F}$ are connected in parallel. What is the equivalent capacitance of the combination? Determine charge on each capacitor, if the combination is connected to 100V supply?
6. An electric dipole with dipole moment $4 \times 10^{-9} \text{ C}\cdot\text{m}$ is aligned at 30° with direction of electric field of magnitude $5 \times 10^4 \text{ N/C}$. Calculate the magnitude of the torque acting on the dipole.
7. A point charge of $2\mu\text{C}$ is at the centre of cubic Gaussian surface 9.0 cm in edge. What is the net electric flux through the surface?
8. What is the amount of work done in moving a 200nC charge between two points 5 cm apart on an equipotential surface?
9. How much work must be done to charge a $24 \mu\text{F}$ capacitor, when the potential Difference between the plates is 500 V ?
10. What is the work done in moving a charge of $100\mu\text{C}$ through a distance of 1cm along the equatorial line of dipole?
11. Two identical charges, Q each are kept at a distance r from each other. A third Charge q is placed on the line joining the two charges such that all the three Charges are in equilibrium. What is magnitude, sign and position of the charge q ?
12. ABCD is a square of side 5m . Charges of $+50\text{C}$, -50C and $+50\text{C}$ are placed at A, C and D respectively. Find the magnitude of resultant electric field at B.
13. A cube with each side a is kept in electric field given by $E = Cx$ as shown in the Figure where C is a positive dimensional constant. Find
 - a) The electric flux through the cube, and
 - b) The net charge inside the cube.

Assignment - 2

1. Cell of emf 2 V and internal resistance 0.1 ohm is connected to a 3.9 ohm external Resistance. What will be the current in circuit?
2. Calculate the resistivity of a material of a wire 1 m long, 0.4 mm in diameter and Having a resistance of 2 ohm .
3. In a potentiometer arrangement; a cell of emf 1.25 V gives a balance point at 35.0 cm length of the wire. If the cell is replaced by another cell and the balance point shifts to 63.0 cm , what is the emf of the second cell?
4. A current is maintained in a conductor of cross-section 10^{-4} m^2 . If the number density, of free electrons be $9 \times 10^{28} \text{ m}^{-3}$ and the drift velocity of free electrons be $6.94 \times 10^{-9} \text{ m/s}$, calculate the current in the conductor.
5. Two wires X, Y have the same resistivity but their cross-sectional areas in the ratio $2:3$ and lengths in the ratio $1:2$. They are first connected in series and then in parallel to a dc source. Find out the ratio of the drift speeds of the electrons in the two wires for the two cases.
6. A short bar magnet placed with its axis at 30° to a uniform magnetic field of 0.2 T experiences a torque of 0.06 Nm .
 - i) Calculate the magnetic moment of the magnet.
 - ii) Find out what orientation of the magnet corresponds to its stable equilibrium in the magnetic field.
7. A solenoid has a core of a material with relative permeability 400 . The winding of the solenoid are insulated from the core and carry a current of 2 A . If the number of turns is 1000 per meter, calculate (i) H , (ii) M and (iii) B .

8. Two long parallel wires carrying currents 8 A and 5 A in the same direction are separated by a distance of 4 cm. Estimate the force on 10 cm length of one wire due to the other wire.
9. A solenoid of 500 turns per meter is carrying a current of 3 A. Its core is made of iron of relative permeability 5000. Determine the magnitudes of magnetic intensity and magnetic field inside the core.
10. A long straight wire carries a current of 35 A. What is the magnitude of magnetic field at a point 20 cm from the wire?
11. A circular coil of wire consisting of 100 turns, each of radius 8 cm carries a current of 0.4 A. What is the magnitude of magnetic field at its center?
12. A closely wound solenoid 80 cm long has 5 layers of winding of 400 turns each. If the current carried is 8 A, estimate the magnetic field inside the solenoid near its centre.
13. A galvanometer of coil resistance $50\ \Omega$ shows full scale deflection for a current of 5 mA. How can it be converted into a voltmeter of range 0 to 15 V ?

MATHEMATICS

1. Solve assignment of chapter 1 to 5 from NDA booklet.
2. **Project:** Make a model on any topic.
3. Make a project file on any topic.
4. Revise chapter 1 to 5 complete in Holidays Homework Notebook.

ACTIVITY 1 {FOR ODD ROLL NO.}

- Make a working model on Inverse Trigonometric Function.
- Make a working model on probability.

ACTIVITY 2 {FOR EVEN ROLL NO.}

- Make a working model on Relation and Functions.
- Make a working model on Conic Section.

1. If A is a square matrix of order 3, such that $A(\text{adj } A) = 10 I$, then $|\text{adj } A|$ is equal to ?
2. If A is 3×3 matrix such that $|A| = 8$, then find $|3A|$.
3. A relation in a set A is called relation, if such element of A is related to itself.
4. If $A+B = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and, $A - 2B = \begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix}$ then, Find A and B.
5. If the function $F(x) = \begin{cases} \frac{x^2-9}{x-3} & \text{if } x \neq 3 \\ k & \text{if } x = 3 \end{cases}$
6. If $[x1] \begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = 0$, then find x.
7. Show that the function $f: R \rightarrow R$ defined by $f(x) = \frac{x}{x^2+1}$ is neither one – one nor onto.
8. If $A = \begin{bmatrix} 0 & 2 \\ 3 & -4 \end{bmatrix}$ and $KA = \begin{bmatrix} 0 & 39 \\ 2b & 24 \end{bmatrix}$, then find the value of K, a and b .
9. If A and B are symmetric matrices such that AB and BA are both defined, then prove that AB – BA is skew symmetric matrix .
10. Use elementary Row operation $\begin{bmatrix} 2 & 1 \\ 2 & 0 \end{bmatrix}$, Find A^{-1} .
11. Using property show that determinant is $\begin{vmatrix} 1 & 3 & 5 \\ 2 & 6 & 10 \\ 31 & 11 & 38 \end{vmatrix} = 0$

12. Show that $\begin{vmatrix} -31 & 160 & 161 \\ 0 & 0 & 0 \\ -15 & 79 & 12 \end{vmatrix}$ matrix is singular.
13. Find K if matrix is singular $\begin{bmatrix} 5-K & K+1 \\ 2 & 4 \end{bmatrix}$.
14. Find the value of $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$.
15. If $A = \frac{1}{3} \begin{vmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ -2 & 2 & -1 \end{vmatrix}$, Show that $AA' = I = A'A$
16. $A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$, $B = [-2 \quad -1 \quad 4]$ verify $(AB)' = B' A'$.
17. $A = \begin{bmatrix} 2 & 1 \\ -3 & 1 \end{bmatrix}$, show that $A + A'$ is symmetric matrix.
18. If $A = \begin{bmatrix} 6 & 2 \\ 1 & 5 \end{bmatrix}$, Verify $(A')^{-1} = (A^{-1})'$.
19. Find the Inverse of $\begin{bmatrix} 2 & 5 \\ -3 & 1 \end{bmatrix}$.
20. If $A = \begin{bmatrix} 2 & 7 \\ 1 & 4 \end{bmatrix}$, Show that $A^2 - 6A + I = 0$.
21. Check whether the system of equations have unique solution or not.
 $x + 2y = 4$
 $2x + 4y = 8$
22. Find the Inverse of A matrix, $A = \begin{bmatrix} 1 & 5 \\ 3 & 8 \end{bmatrix}$ by using elementary row operation.
23. If $f(x) = \begin{cases} \frac{1-\cos 4x}{8x^2}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous, find k.
24. Examine the continuity of $f(x) = 2x^2 - 1$, at $x = 3$.
25. Find the derivative of $f(x) = x^2$ at $x = 2$.
26. Show that the function $f(x) = \begin{cases} 2+x, & x \geq 0 \\ 2-x, & x < 0 \end{cases}$ is not derivable.
27. Show that the function $f(x) = \begin{cases} x+1, & x \geq 1 \\ x^2+1, & \text{if } x < 1 \end{cases}$.
28. Examine the continuity of $f(x) = \begin{cases} x^3-3, & \text{if } x \leq 2 \\ x^2+1, & \text{if } x > 2 \end{cases}$ at $x=2$.
29. Solve the equations by matrix method $5x+2y=3$, $3x+4y=5$.
30. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ then verify $(\text{adj}A)^{-1} = \text{adj}A^{-1}$

Chemistry :

1. Example of gas dissolved in solid:

- | | |
|---------------------------------------|-----------------------------|
| (a) Oxygen dissolved in water | (b) Camphor in nitrogen gas |
| (c) Carbon dioxide dissolved in water | (d) Hydrogen in palladium |

2. Which among the following is an example of a solid solution?

- (a) Copper dissolved in gold
- (b) Ethanol dissolved in water
- (c) Glucose dissolved in water
- (d) Sodium chloride dissolved in water

3. In how many ways can the concentration of a solution be expressed?

- (a) 1
- (b) 3
- (c) 5
- (d) 8

4. What is the mole fraction of ethylene glycol in a solution containing 20g by mass?

- (a) 0.022
- (b) 0.054
- (c) 0.068
- (d) 0.090

5. The solubility of a substance in a solvent depends on

- (a) Temperature
- (b) Pressure
- (c) Nature of solute and solvent
- (d) All of the above

6. Which of the following does not dissolve in benzene?

- (a) Naphthalene
- (b) Anthracene
- (c) $C_6H_{12}O_6$
- (d) All of the above

7. Choose the ideal solution from the following.

- (a) Carbon disulphide and acetone
- (b) Phenol and Aniline
- (c) Chloroform and Acetone
- (d) Ethyl iodide and ethyl bromide

8. How does the solubility of gasses vary with pressure?

- (a) Increases with pressure
- (b) Decreases with pressure
- (c) First increases and then decreases
- (d) No effect

9. How does the solubility of gasses in a liquid vary with increase in temperature?

- (a) Increases with temperature
- (b) Decreases with temperature
- (c) First increases and then decreases
- (d) No effect

10. Which law explained solubility of gasses in a liquid?

- (a) Charles law
- (b) Henry's law
- (c) Raoult's law
- (d) Boyle's law

11. Choose the correct example for a non-ideal solution?

- (a) Benzene + Toluene
- (b) Hexane + Heptane
- (c) Chlorobenzene + Bromobenzene
- (d) Ethanol + Hexane

12. Which condition holds for the ideal solution?

- (a) Change in volume is zero
- (b) Change in volume is non-zero
- (c) Change in enthalpy is non-zero
- (d) None of the above

13. Which condition holds for a non-ideal solution?

- (a) Change in volume is zero
- (b) Change in volume is non-zero
- (c) Change in enthalpy is zero
- (d) None of the above

14. What does Henry's constant depend upon?

- (a) Nature of gas
- (b) Nature of solvent
- (c) Temperature
- (d) All of the above

15. How is Henry's constant dependent on temperature?

- (a) Directly proportional
- (b) Inversely proportional
- (c) Varies exponentially
- (d) None of the above

16. Dissolution of gas in a liquid is

- (a) Endothermic
- (b) Exothermic
- (c) No heat change
- (d) No change in temperature

17. Which gas dissolves the most in water ?

- (a) Carbon dioxide
- (b) Nitrogen
- (c) Hydrogen
- (d) Ammonia

18. The pair of miscible liquids among the following is :

- (a) Oil and water
- (b) Kerosene and water
- (c) Vegetable oil and corn syrup
- (d) Ethanol and water

19. The example of a colloidal solution is :

- (a) Air
- (b) Milk
- (c) Alcohol
- (d) Urea

20. The example of a suspension is :

- (a) Milk
- (b) Alcohol
- (c) Urea
- (d) Mixture of water and sand

“

That man has
reached immortality
who is disturbed by
nothing material.

”

- Swami Vivekananda

