

CONSOLIDATED HOLIDAY HOMEWORK AUTUMN BREAK CLASS 12TH A

AUTUMN BREAK HOMEWORK (CLASS-12)

SUBJECT-PHYSICS

Q1 State Gauss law in Electrostatics Derive expression for electric field due to uniformly

charged spherical shell at a point

(A) inside the spherical shell

(B) on the shell

(C) outside the shell

Q2 Derive the expression for electric field at an axial point of electric dipole.

Q3 Define equipotential surface Draw equipotential surface for

(A) Two positive point charges

(B) Electric dipole

Q4 Derive expression for capacitance of parallel plate capacitor when vacuum is inside the plates of parallel plate capacitor

Q5 Define wheatstone bridge Draw its circuit diagram. Derive the formula for balance condition of wheatstone bridge using Kirchhoff's laws.

Q6 State Kirchhoff's laws of electricity.

Q7 State Biot Savart's law Derive expression for magnetic field due to a circular current

carrying loop on its axis using Biot Savart's law. Q8 State Ampere circuital law. Derive the expression for magnetic field inside the solenoid.

Q9 Define Diamagnetic substances, Paramagnetic substances and Ferromagnetic substances. Write the properties of each of them.

Q10 Define electromagnetic induction. State the laws of electromagnetic induction

Q11 Define self inductance. Write its unit and dimension.

Q12 State Lenz's law. Show that Lenz law is consequence of law of conservation of energy.

Q13 Define AC generator Write its principle. Draw its diagram. Write its working also

Q14 What is impedance of series LCR circuit when current is maximum

Q15 State modified Ampere law.

Q16 Draw the graph between direction of em wave, Electric field vector and magnetic field vector

Q17 Write and Prove Lens maker formula

Q18 Write and Prove Prism formula

Q19 Define wavefront Name the types of wavefront. Draw figure of each

Q20 Define interference. Explain Young double slit experiment. Find expression for resultant intensity in young double slit experiment. Write formula for fringe width.

5 MCQ from each chapter from 1 to 10.

3 short answer(2 or 3 marks) and two long answer(5 marks) of previous year board question paper from chapter 1 to 10

HOLIDAY HOMEWORK: CHEMISTRY

CLASS XII | ACADEMIC SESSION 2026–27
Previous Years' CBSE Board Examination Questions (PYQ)

Units: Haloalkanes & Haloarenes | Alcohols, Phenols & Ethers | Aldehydes, Ketones & Carboxylic Acids

☐ **INSTRUCTIONS & SUBMISSION GUIDELINES**• Solve all questions neatly in your Chemistry homework notebook. • Write complete, balanced chemical equations, intermediate steps, and reaction conditions. • Highlight distinguishing visual observations (precipitate colors, effervescence, odor) in chemical tests. • Review standard mechanisms carefully: SN1, SN2, and acid-catalysed dehydration.

PART A: Objective & Assertion-Reason Questions

1 Mark Each | Compulsory

Q1. (PYQ) Which of the following alkyl halides undergoes nucleophilic substitution via the SN1 pathway at the fastest rate?

- a) $\text{CH}_3\text{CH}_2\text{Cl}$
- b) $(\text{CH}_3)_2\text{CH-Cl}$
- c) $(\text{CH}_3)_3\text{C-Cl}$
- d) CH_3Cl

Q2. (PYQ) Phenol, when treated with chloroform in the presence of dilute aqueous NaOH followed by acidification, yields salicylaldehyde. The electrophile intermediate involved in this reaction is:

- a) CHCl_2^+
- b) $:\text{CCl}_2$ (Dichlorocarbene)
- c) CHO^+
- d) CCl_3^-

Q3. (PYQ) Reaction of tert-butyl ethyl ether with excess concentrated HI at 373 K yields:

- a) $(\text{CH}_3)_3\text{C-I} + \text{CH}_3\text{CH}_2\text{OH}$
- b) $(\text{CH}_3)_3\text{C-OH} + \text{CH}_3\text{CH}_2\text{I}$
- c) $(\text{CH}_3)_3\text{C-I} + \text{CH}_3\text{CH}_2\text{I}$
- d) $(\text{CH}_3)_3\text{C-OH} + \text{CH}_3\text{CH}_2\text{OH}$

Q4. (PYQ) Which of the following carbonyl compounds gives a positive iodoform test with yellow precipitate?

- a) Pentan-3-one
- b) Pentan-2-one
- c) Benzaldehyde
- d) 3-Methylbutanal

Directions for Q5 & Q6: Select the correct choice from (A), (B), (C), or (D):

- (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).
- (B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

Q5. (PYQ)

Assertion (A): Boiling points of alcohols are noticeably higher than those of isomeric ethers and haloalkanes of comparable molar mass.

Reason (R): Alcohols undergo intermolecular hydrogen bonding through polar -OH groups.

Q6. (PYQ)

Assertion (A): Benzaldehyde is less reactive than ethanal towards nucleophilic addition reactions.

Reason (R): The carbonyl carbon in benzaldehyde has lower electrophilicity due to resonance electron donation from the benzene ring.

PART B: Very Short Answer Questions

2 Marks Each

Q7. (PYQ) Give scientifically sound reasons for each of the following observations:

- i) Chlorobenzene is extremely unreactive towards nucleophilic substitution reactions as compared to chloroethane.
- ii) Dipole moment of chlorobenzene (1.69 D) is lower than that of cyclohexyl chloride (1.86 D).

Q8. (PYQ) Write balanced chemical equations illustrating the following named reactions:

- i) Reimer-Tiemann Reaction
- ii) Kolbe's Reaction

Q9. (PYQ) How will you chemically distinguish between the following pairs using a single, clear chemical test? Write the complete reactions involved.

- i) Phenol and Ethanol
- ii) Propanal and Propanone

Q10. (PYQ) Arrange the following sets of compounds in increasing order of the specified property:

- i) Propan-1-ol, Propan-2-ol, 2-Methylpropan-2-ol (Order of acidic strength)
- ii) CH_3CHO , CH_3COCH_3 , HCHO , $\text{C}_6\text{H}_5\text{COCH}_3$ (Reactivity towards HCN addition)

PART C: Short Answer Questions

3 Marks Each

Q11. (PYQ) Answer the following regarding halogen derivatives:

- i) Outline the complete mechanism for the alkaline hydrolysis of tert-butyl bromide, $(\text{CH}_3)_3\text{C-Br}$, with aqueous KOH.
- ii) Explain why an equimolar racemic mixture lacks net optical rotation.
- iii) What is an ambident nucleophile? Illustrate why alkyl halides react with KCN to give alkyl cyanides but with AgCN to give alkyl isocyanides as major products.

Q12. (PYQ) Predict and write the structural formula of the major organic product in each of the following transformations:

- i) $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 + \text{HBr} \xrightarrow{\text{(Benzoyl Peroxide)}}$
- ii) $(\text{CH}_3)_3\text{C-O}^- \text{Na}^+ + \text{CH}_3\text{CH}_2\text{Br} \xrightarrow{\text{(Heat)}}$
- iii) $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_3 \xrightarrow{\text{(Conc. H}_2\text{SO}_4, 443 \text{ K)}}$

Q13. (PYQ) Specify suitable reagents and chemical conditions to carry out the following conversions:

- i) Toluene $\longrightarrow$ Benzaldehyde (Etard reaction)
- ii) Bromobenzene $\longrightarrow$ 1-Phenylethanol (via Grignard reagent)
- iii) Ethanol $\longrightarrow$ But-2-enal (via Aldol condensation pathway)

Q14. (PYQ) Account for the following theoretical observations:

- i) Carboxylic acids do not form the characteristic addition products with 2,4-DNP or NaHSO_3 despite containing a carbonyl ($>\text{C}=\text{O}$) group.
- ii) Chloroacetic acid (ClCH_2COOH) is a stronger acid than acetic acid (CH_3COOH), whereas fluoroacetic acid (FCH_2COOH) is stronger than both.
- iii) Cyclohexanone undergoes addition with HCN to give cyanohydrin in high yield, whereas 2,2,6-trimethylcyclohexanone gives negligible yield under identical conditions.

PART D: Long Answer & Comprehensive Road-Map Questions

5 Marks Each

Q15. Mechanism & Chemical Concepts (PYQ)

- i) Write the step-by-step mechanism of acid-catalysed dehydration of ethanol to give ethene at 443 K. Explain what happens if the reaction is carried out at 413 K.
- ii) Explain on the basis of resonance and charge delocalization why phenol is more acidic than aliphatic alcohols.

iii) Discuss the effect of electron-withdrawing nitro ($-\text{NO}_2$) substitution at ortho and para positions versus meta position on the acidity of phenol.

Q16. Road-Map / Structure Elucidation Problem (PYQ)

An aromatic organic compound [A] having molecular formula $\text{C}_8\text{H}_8\text{O}$ gives an orange-red precipitate with 2,4-dinitrophenylhydrazine (2,4-DNP) reagent and forms a yellow precipitate when heated with iodine and aqueous sodium hydroxide.

- Compound [A] does not reduce Tollens' reagent or Fehling's solution.
- On vigorous oxidation with alkaline KMnO_4 followed by acid hydrolysis, compound [A] gives a monocarboxylic acid [B] of molecular formula $\text{C}_7\text{H}_6\text{O}_2$.
- When compound [B] is treated with thionyl chloride (SOCl_2), it forms compound [C].
- Compound [C] on catalytic hydrogenation over Pd/BaSO_4 poisoned with sulfur (Rosenmund reduction) yields compound [D].

Tasks:

- Identify the structural formulas and write IUPAC names for compounds [A], [B], [C], and [D].
- Write balanced chemical equations for all four chemical reactions described.

17. Prepare and do all the ncert problems of above three chapters

AUTUMN BREAK HOLIDAY HOMEWORK

Mathematics (041) Class 12

Kendriya Vidyalaya Mati Akbarpur Shift 1 - Session 2026-27

Chapters Covered (for revision)

- Ch 1 - Relations and Functions
- Ch 2 - Inverse Trigonometric Functions
- Ch 3 - Matrices
- Ch 4 - Determinants
- Ch 5 - Continuity and Differentiability
- Ch 6 - Applications of Derivatives
- Ch 7 - Integrals
- Ch 8 - Application of Integrals
- Ch 9 - Differential Equations
- Ch 10 - Vector Algebra

Instructions for Students

- Attempt one worksheet each day. Do all the work neatly in your Maths notebook.
- Write the question number and then the complete solution, showing each step.
- Draw diagrams and graphs with a pencil and ruler wherever needed.
- Revise the chapter from the textbook before starting that day's worksheet.
- This is revision work only, based on what has already been taught in class.

Day 1: Relations and Functions

1. Check whether $f : \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = 3x + 2$ is one-one.
2. Show that $f(x) = x^2$ is not one-one on $\mathbb{R}$.
3. Find the inverse of $f(x) = 2x + 3$.
4. Check whether the relation $R = \{(1,1), (2,2), (3,3), (1,2)\}$ on $\{1, 2, 3\}$ is reflexive, symmetric and transitive.
5. Show that $f : \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = 5x + 3$ is bijective.
6. Let $A = \{1, 2, 3\}$. Find the number of one-one functions from A to A .
7. If $f(x) = x + 3$ and $g(x) = x^2$, find $f \circ g(x)$ and $g \circ f(x)$.
8. Show that $f : \mathbb{N} \rightarrow \mathbb{N}$, $f(x) = 2x$ is one-one but not onto.

Day 2: Inverse Trigonometric Functions

1. Find the principal value of $\sin^{-1}(1/2)$.
2. Find the value of $\cos^{-1}(-1/2)$.
3. Evaluate: $\tan^{-1}(1)$.
4. Find the value of $\sin^{-1}(\sin(2\pi/3))$.
5. Evaluate: $\cos^{-1}(\cos(7\pi/6))$.
6. Prove: $\tan^{-1}(1) + \tan^{-1}(2) + \tan^{-1}(3) = \pi$.
7. Find the value of $\sin(\cos^{-1}(3/5))$.
8. Evaluate: $\tan^{-1}(\sqrt{3}) - \cot^{-1}(-\sqrt{3})$.

Day 3: Matrices

1. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$, find $A + B$.
2. Find $2A$ where $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.
3. Write the order of a matrix with 3 rows and 4 columns.
4. Find AB where $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$.
5. Find the transpose of $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$.
6. If $A = \begin{bmatrix} 2 & 3 \\ 1 & -1 \end{bmatrix}$, find A^2 .
7. Find x and y if $\begin{bmatrix} x & 3 \\ 2 & y \end{bmatrix} = \begin{bmatrix} 5 & 3 \\ 2 & 4 \end{bmatrix}$.
8. Show that the matrix $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is symmetric.

Day 4: Determinants

1. Find the determinant of $\begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$.
2. Find the determinant of $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$.
3. Find the value of x if $|\begin{bmatrix} x & 2 \\ 3 & 4 \end{bmatrix}| = 10$.
4. Find the area of the triangle with vertices $(0, 0)$, $(3, 0)$ and $(0, 4)$ using determinants.
5. Find the adjoint of $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$.
6. Find the inverse of $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$.
7. Solve using Cramer's rule: $x + y = 5$ and $x - y = 1$.
8. Find the minor of the element 5 in the matrix $\begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix}$.

Day 5: Continuity and Differentiability

1. Differentiate: $x^3 + 2x^2 - 5$.
2. Differentiate: $\sin x + \cos x$.
3. Find dy/dx if $y = e^x + \log x$.
4. Differentiate: $y = x \sin x$.
5. Check the continuity of $f(x) = |x|$ at $x = 0$.
6. Differentiate: $y = (2x + 3)^5$.
7. Find dy/dx if $y = \tan x$.
8. Differentiate: $y = x^2 e^x$.

Day 6: Applications of Derivatives

1. Find the slope of the tangent to $y = x^2$ at $x = 2$.
2. Find the maximum value of $f(x) = -(x - 1)^2 + 5$.
3. Find the interval in which $f(x) = x^2 - 4x$ is increasing.
4. Find the critical points of $f(x) = x^3 - 3x$.
5. Find the equation of the tangent to $y = x^3$ at the point $(1, 1)$.
6. The radius of a circle is increasing at 2 cm/s. Find the rate of increase of its area when $r = 5$ cm.
7. Find the local minimum of $f(x) = x^2 - 6x + 5$.
8. Find two positive numbers whose sum is 16 and whose product is maximum.

Day 7: Integrals

1. Evaluate: integral of $x^2 dx$.
2. Evaluate: integral of $(2x + 3) dx$.
3. Evaluate: integral of $(1/x) dx$.
4. Evaluate: integral of $\sin x dx$.
5. Evaluate: integral of $01x dx$.
6. Evaluate: integral of $e^x dx$.
7. Evaluate: integral of $(x^2 + 1/x) dx$.
8. Evaluate: integral from 0 to $\pi/2$ of $\cos x dx$.

Day 8: Application of Integrals

1. Find the area bounded by $y = x^2$, the x-axis, $x = 0$ and $x = 3$.
2. Find the area of the circle $x^2 + y^2 = 9$ using integration.
3. Find the area bounded by $y = x$, the x-axis and $x = 4$.
4. Find the area enclosed between $y = x^2$ and $y = x$.
5. Find the area of the region bounded by $y = \sqrt{x}$, the x-axis, $x = 0$ and $x = 4$.
6. Find the area bounded by the ellipse $x^2/16 + y^2/9 = 1$.
7. Find the area of the triangle bounded by $y = 2x$, the x-axis and $x = 3$.
8. Find the area bounded by $y = x^2$, $x = 1$, $x = 2$ and the x-axis.

Day 9: Differential Equations

1. Find the order and the degree of $d^2y/dx^2 + (dy/dx)^3 + y = 0$.
2. Solve: $dy/dx = 2x$.
3. Solve: $dy/dx = y/x$.
4. Find the order and the degree of $(dy/dx)^2 + y = 0$.
5. Solve: $dy/dx + y = 0$.
6. Verify that $y = e^x$ is a solution of $dy/dx - y = 0$.
7. Solve: $dy/dx = \cos x$.
8. Find the integrating factor of $dy/dx + y/x = x$.

Day 10: Vector Algebra and Mixed Revision

1. Find the magnitude of the vector $3i + 4j$.
2. Find the unit vector in the direction of $6i + 8j$.
3. Find the dot product of $(i + 2j)$ and $(3i + j)$.
4. If $|a| = 3$, $|b| = 4$ and the angle between them is 60 degrees, find $a \cdot b$.
5. Find the cross product of i and j .
6. Find the direction cosines of the vector $i + j + k$.
7. If $a = 2i - j$ and $b = i + j$, find $a + b$.
8. Find the projection of $a = 2i + 3j$ on $b = i + j$.

NOTE: 1. Prepare for Monthly exam.

2. Prepare Activity file.

PM SHRI KENDRIYA VIDYALAYA MATI, SHIFT I

AUTUMN BREAK ASSIGNMENT (2026-27)

CLASS-XII

ENGLISH CORE (301)

1. Prepare project file on the allotted topics for Board Project Assessment keeping in mind all the instructions given. See the sample files given.

Project should be hand-written along with the data and supporting pictures.

(For any doubt, feel free to ask)

2. Prepare for Monthly Test October

SYLLABUS

Comprehension Passage

Poets and Pancakes

A Roadside Stand

The Enemy

Invitation and Replies

Article writing

SUBJECT : COMPUTER SCIENCE

- 1 Which type of file does not have delimiters?
- 2 The process of converting the structure to a byte stream before writing to the file is known as _____.
- 3 The process of converting byte stream back to the original structure is known as _____
- 4 Raman open a file in readmode, but the file doesn't exit in the folder.
Python raised an error for the code. What type of error will be shown?
- 5 The prefix _____ in front of a string makes it raw string that is no special meaning attached to any character
- 6 Pickling is otherwise known as _____
- 7 CSV files are opened with _____ argument to suppress EOL translation
- 8 Which of the following statement is incorrect in the context of binary files?
a. Information is stored in the same format in which the information is held in memory.
b. No character translation takes place
c. Every line ends with a new line character
d. pickle module is used for reading and writing
- 9 What is EOFError? How can we handle EOFError in python
- 10 How text files and binary files are stored inside computer memory?
- 11 Name any two exceptions that occur while working with pickle module.
- 12 What is the difference between writer object' writerow() and writerows() function?
- 13 Binary files are the best way to store program information. Discuss
- 14 A network that consists of both LANs and MANs is called a Wide area network?
a. True b. False
- 15 Arrange the Following Types of Networks according to their size, from largest to smallest?
a. LAN, WAN, MAN b. WAN, LAN, MAN
c. MAN, LAN, WAN d. WAN, MAN, LAN
- 16 You are a member of a club that deals with computer networks. The club has to take a project to build a MAN. Where would this project likely take place?
a. A small building/organization b. University or college
c. Home d. None of the above
- 17 What is the acronym MAN stand for?
a. Magnetic Access Network b. Metropolitan Area Network
c. Multi-Area Network d.. Multi-Access net
- 18 In your school there is a library, and you can use the internet to do research, this library will most likely be a WAN network?

- a. True b. False
- 19 Types of Networks are Categories by their Geographical Area cover?
a. True b. False
- 20 Metropolitan Area Network Normally Require an Internet connection?
a. True b. False
- 21 A network that consists of both LANs and MANs is called a Wide area network?
a. True b. False
- 22 Arrange the Following Types of Networks according to their size, from largest to smallest?
a. LAN, WAN, MAN b. WAN, LAN, MAN
c. MAN, LAN, WAN d. WAN, MAN, LAN
- 232 You are a member of a club that deals with computer networks. The club has to take a project to build a MAN. Where would this project likely take place?
a. A small building/organization b. University or college
c. Home d. None of the above
- 24 What is the acronym MAN stand for?
a. Magnetic Access Network b. Metropolitan Area Network
c. Multi-Area Network d.. Multi-Access net
- 25 In your school there is a library, and you can use the internet to do research, this library will most likely be a WAN network?
a. True b. False
- 26 Types of Networks are Categories by their Geographical Area cover?
a. True b. False

Short Type:

Q 1 Write a user defined function in python that displays the number of lines starting with 'H' in the file para.txt

Q2 write a function countmy() in python to read the text file "DATA.TXT" and count the number of times "my" occurs in the file. For example if the file DATA.TXT contains-"This is my website. I have displayed my preference in the CHOICE section "-the countmy() function should display the output as:"my occurs 2 times".

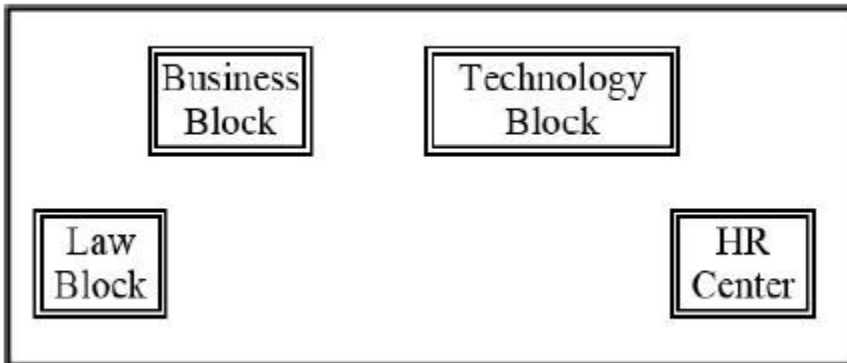
Q3 write a method in python to read lines from a text file DIARY.TXT and display those lines which start with the alphabets P.

Q4 write a method in python to read lines from a text file MYNOTES.TXT and display those lines which start with alphabets 'K'

Q5 write a program to display all the records in a file along with line/record number.

Q6 write a program that copies a text file "source.txt" onto "target.txt" barring the lines starting with @ sign.

Q7. MyPace University is setting up its academic blocks at Naya Raipur and is planning to set up a network. The University has 3 academic blocks and one Human Resource Center as shown in the diagram below: Study the following structure and answer questions (a) to (e)



Center to Center distances between various blocks/center is as follows:	
Law Block to business Block	40m
Law block to Technology Block	80m
Law Block to HR center	105m
Business Block to technology Block	30m
Business Block to HR Center	35m
Technology block to HR center	15m

Number of computers in each of the blocks/Center is as follows:

Law Block	15
Technology Block	40
HR center	115
Business Block	25

a) Suggest the most suitable place (i.e., Block/Center) to install the server of this University with a suitable reason.

b) Suggest an ideal layout for connecting these blocks/centers for a wired connectivity.

c) Which device will you suggest to be placed/installed in each of these blocks/centers to efficiently connect all the computers within these blocks/centers?

d) Suggest the placement of a Repeater in the network with justification.

e) The university is planning to connect its admission office in Delhi, which is more than 1250km from university. Which type of network out of LAN, MAN, or WAN will be formed? Justify your answer.
