SAINIK SCHOOL CHITTORGARH

Autumn VACATION HOLIDAY HOMEWORK

INFORMATION

SUBJECT NAME: Mathematics	CLASS & SECTION: Class XII A & B
SUBJECT TEACHER NAME: Rakesh Rampuria & Manish Jain	
INSTRUCTIONS: Compulsory to attempt all in Lab Manual/Record file.	

ASSIGNMENT

Activity -1 To verify that the relation R in the set L of all lines in a plane, defined by R = {(l,m) : l Perpendicular to m } is symmetric but neither reflexive nor transitive.

Activity -2 To verify that the relation R in the set L of all lines in a plane , defined by R = { (l,m) : l parallel to m } is an equivalence relation.

Activity -3 To demonstrate a function which is not one-one but is onto.

Activity - 4 To demonstrate a function which is one-one but not onto.

Activity- 5   To draw the graph of $\sin^{-1} x,$ using the graph of $\sin x$ and demonstrate the concept of mirror reflection (about the line y = x)

PYQ of CBSE Class XII Maths from last 3 years (2025,2024, 2023)

SAINIK SCHOOL CHITTORGARH
AUTUMN VACATION HOLIDAY HOMEWORK

SUBJECT: COMPUTER SCIENCE (083)	**CLASS & SECTION :** XII-A
SUBJECT TEACHER: MR ABHISHEK BHARDWAJ	

INSTRUCTIONS

(i) Do your homework by yourself.
(ii) Use same notebook for holiday homework.
(iii) Don't use computer to find the output of a program.
(iv) Answers should be neat & clean with concepts.
(v) Do all work with date & day.
(vi) Try to do your written work regularly to enhance your writing power.
(vii) Pay special attention towards your health and caring.
(viii) Completed Homework notebook to be submitted on **07 Nov 2025** *positively.*
(ix) In case of any difficulty please mail me at **ssccomputerscience@gmail.com**

Chapter 9   : Data Structures – II : Stacks

1.   Explain different types of Data Structures in Python with the help of its **classification** and **hierarchy**.

2.   What do you mean by **Stack**? Explain **Push**, **Pop** and **Peek** operations which we can perform on Stack.

Appendix E : Exception Handling

3.   Write down the **benefits** of Exceptional Handling in Python.

4.   Differentiate among keywords '**raise**', '**assert**' and **'try'** used in Exception Handling.

Chapter 11 : Relational Databases

5.   What are **DDL** and **DML** commands in MySQL. Write one-one example of DDL and DML commands.

6.   Draw neat and clean diagram of Database Management System (**DBMS**).

7.   Explain the following **Constraints** in MySQL:
        (i) Unique   (ii) Default   (iii) Not Null

Chapter 13 : Table Creation & Data Manipulation Commands

8.   Write **short notes** on the following:
        (i) Primary Key   (ii) Foreign Key

SAINIK SCHOOL CHITTORGARH
AUTUMN VACATION HOLIDAY HOMEWORK 2025-26

SUBJECT NAME- BIOLOGY	
CLASS & SECTION: XII B	**SUBJECT TEACHER NAME: MANJIT SINGH**

INSTRUCTIONS:

1. Make a separate note book for the HW

---

1. What does central dogma state in molecular biology? How does it differ in some viruses?
2. Why is DNA a better genetic material when compared to RNA?
3. List any four properties of a molecule to be able to act as a genetic material.
4. . It is established that RNA is the first genetic material. Explain giving three reasons.
5. Name the source of energy for the replication of DNA.
6. Why is it not possible for an alien DNA to become part of chromosome anywhere along its length and replicate normally?
7. Write the conclusion drawn by Griffith at the end of his experiment with *Streptococcus pneumoniae.*
8. How did O. Avery, C. MacLeod and M. McCarty prove that DNA was the genetic Material ? Explain.
9. How did Hershey and Chase prove that DNA is the hereditary material? Explain their experiment with suitable diagrams.
10. What did Meselson and Stahl observe when they cultured E. coli in a medium containing 15NH4Cl for a few generations and centrifuged the content?
11. When they transferred one such bacterium to the normal medium of NH4Cl and cultured for 2 generations?
12. What did Meselson and Stahl conclude from this experiment? Explain with the help of diagrams.
13. Explain the process of DNA replication with the help of a schematic diagram. In which phase of the cell cycle does replication occur in eukaryotes? What would happen if cell-division is not followed after DNA replication?
14. Describe the process of transcription in bacteria.
15. Explain the processing the hnRNA needs to undergo before becoming functional mRNA of eukaryotes.
16. Explain the process of Protein synthesis in prokaryotes?
17. How the Protein synthesis in prokaryotes are different from eukaryotes.
18. Which methodology is used while sequencing the total DNA from a cell?
19. Write the different component of a lac –operon in E. coli .Explain its expression in presence and absence of lactose.
20. How is DNA fingerprinting done? Name any two types of human samples which can be used for DNA fingerprinting. Explain the process sequentially?b) Mention any two situation when the technique is useful.

SAINIK SCHOOL CHITTORGARH
LIST OF INVESTIGATORY PROJECT FOR BIOLOGY
CLASS XII

The Project Report must be in the following order:
1. Cover Page
2. Certificate
3. Acknowledgement
4. Table of Contents
5. Abstract
6. Introduction
7. Chapters
8.
9.
10. Conclusion
11. Bibliography

S No	Sch No	Name	Topic of Project	Sign
1	5855	Ravindra Singh Shekhawat	Human Genome Project	Ravindra
2	5856	Sachin	Pollination : Types and Agents	Sachin
3	5858	Vikash Tholiya	Study of Cancer	Vikas
4	5861	Anil Kumar	Gene Therapy Project	Anil
5	5876	Aaditya Singh Shekhawat	Infertility : Cause and Treatment	Aaditya
6	5880	Samradha Singh	Drug addiction	Sam
7	5886	Shlok Poonia	Adaptation in Plants for Cross Pollination	
8	5888	Premraj Gurjar	Mendelian Disorders	Premraj Gurjar
9	5891	Sahil Raj	Microbes in Human Welfare	
10	5901	Mayank Vishwakarma	DNA Fingerprinting	Mayank
11	5904	Madhusudan Singh	Sex determination	Madhusudan
12	5907	Mayank Babu	Recombinant DNA Technology in today's medicines	Mayank
13	5919	Vishal	Human Insulin and Vaccine production	Vishal
14	5927	Mohit Meena	Human Embryo development	Mohit
15	5929	Rohit Singha	*Bt* Crops	Singh
16	5930	Karnaveer Sharma	Drug and Alcohol Abuse	
17	5932	Anshul	Chromosomal Aberrations	
18	5933	Himanshu Bairwa	Evidences of Biological Evolution	Hmu
19	5939	Anurag Thalore	DNA & RNA	AT
20	5942	Priyaranjan Kumar	Sewage Treatment Plant	Priyaranjan
21	5945	Mayank	Types of Interactions among Organisms	Mayank
22	5952	Shrey Singhal	Population Attributes	
23	5956	Shailesh Kumar Motsara	Assisted reproductive Technologies	
24	5962	Vishal	Birth control measures	Vishal
25	5964	Sidharth Yadav	Gametogenesis	
26	5965	Hemendra Singh Jadaun	Menstruation	Hemendra
27	5968	Lucky Bijarniya	Translation	Lucky
28	D-226	Vaishnavi Gaur	Transcription	

The Investigatory project report to be submitted to Mr Manjit Singh, PGT Biology on 05 Nov 2025

SAINIK SCHOOL CHITTORGARH

AUTUMN VACATION HOLIDAY HOMEWORK

INFORMATION	
SUBJECT NAME: ENGLISH	**CLASS & SECTION:XII- A &B**
SUBJECT TEACHER NAME: Mrs. POOJA SINGH SISODIA	
INSTRUCTIONS: Assignment - The project must be made in a file, addressing all the specified points and showcasing your creativity.	

ASSIGNMENT

(For Section –A Cadets)

Project Title: Experiencing the Eternal Charm of "A Thing of Beauty"

Objective:
- To appreciate the universal and timeless value of beauty as described by John Keats.
- To explore how beauty in nature, art, and life uplifts human spirit and provides relief from struggles.

Project Description:
Cadets are required to compile a project file on the poem 'A Thing of Beauty'. The project should include literary appreciation along with creative expressions and personal reflections, connecting the poem's ideas to real-life experiences.

Guidelines for the Project File:
1. Cover Page – Title, Cadet details, and visual pictures/drawing related to beauty.
2. Introduction – Brief note on John Keats and summary of the poem.
3. Central Idea & Analysis – Concept of eternal beauty, its impact on human life and poetic devices.
4. Research Component – Identify 2–3 creations of beauty (nature, art, monuments, music) and explain their impact.
5. Creative Expression – Self-composed poem or article and collage of images.
6. Conclusion – Reflective note on why beauty is eternal.
7. Bibliography – NCERT Flamingo, reference sources, and student's work.

(For Section – B Cadets)

Project Title: Voices Against Oppression – Based on "Deep Water" & "The Last Lesson"

Objective:
-To explore how individuals confront fear and oppression.

-To connect literary experiences with real-life struggles for freedom and courage.

Project Description:

Cadets will compile a comparative project file exploring how fear and oppression are confronted in the stories 'Deep Water' and 'The Last Lesson'. They will connect these lessons with real-life experiences of courage and resilience.

Guidelines for the Project File:

1. **Cover Page – Title, cadet details, theme-based design.**
2. **Introduction – Brief summaries of 'Deep Water' and 'The Last Lesson'.**
3. **Themes & Analysis – Courage, resistance, and freedom.**
4. **Research Component – Collect 2–3 real-life stories of people overcoming fear/oppression.**
5. **Interview – Speak to a teacher/elder on the importance of preserving language and culture.**
6. **Personal Reflection – Write about a fear you have overcome.**
7. **Conclusion – Relevance of these themes in the modern context.**
8. **Bibliography – NCERT, reference sources, personal interviews.**

Deadline: 8th Nov., 2025

NOTE: Use your creativity, add relevant picture and compile in a file. A4 size paper to be used.

SYMPOSIUM :

All cadets in their respective batches are required to prepare the presentation on the assigned topic for symposium. The same to be put up to their respective I/C by 5th Nov.,25.

SAINIK SCHOOL CHITTORGARH
AUTUMN VACATION HOLIDAY HOMEWORK 2025-26

SUBJECT NAME- CHEMISTRY	
CLASS & SECTION: XII	SUBJECT TEACHER NAME: TONY ABRAHAM

INSTRUCTIONS:

1. Strictly adhere to the projects given against your school number. This is for CBSE practical evaluation carrying 4 marks

2. Make a separate note book for the HW

ASSIGNMENT

1. Draw the structure of the major monohalo product in the reaction of an alkene with HBr (Markovnikov / anti-Markovnikov as appropriate).
2. Write the mechanism of nucleophilic substitution (SN1 or SN2) for a primary, secondary or tertiary haloalkane.
3. Compare SN1 and SN2 mechanisms: mention conditions, kinetics, and examples.
4. Which haloalkane (primary, secondary, tertiary) will undergo SN1 most readily and why?
5. Explain why haloarenes are much less reactive toward nucleophilic substitution compared to haloalkanes.
6. Give a chemical test to distinguish between (i) benzyl chloride and chlorobenzene, (ii) tertiary butyl bromide and sec-butyl bromide.
7. How can you convert: (i) alcohol $\rightarrow$ alkyl halide (ii) alkyl halide $\rightarrow$ alcohol (iii) alkyl halide $\rightarrow$ alkene $\rightarrow$ haloalkane?
8. Why are alkyl halides insoluble in water despite being polar?
9. Which is more reactive toward SN1: tert-butyl chloride or isopropyl chloride? Why?
10. Out of CH_3-CH_2-Br and $CH_3-CH(Br)-CH_3$, which undergoes SN2 faster? Justify.
11. Out of chlorobenzene and benzyl chloride, which is more easily hydrolysed by aqueous KOH? Why?
12. Write the conversion steps for: benzene $\rightarrow$ chlorobenzene $\rightarrow$ phenol $\rightarrow$ aniline (show reagents).
13. Compare acidity of phenol vs. alcohol; explain with resonance and inductive effect.
14. What is Kolbe's reaction? Write equation.
15. What is the Reimer–Tiemann reaction? Write mechanism and give an example.
16. Explain Williamson's ether synthesis with mechanism.
17. How can you convert: (i) alcohol $\rightarrow$ ether (ii) ether $\rightarrow$ alcohol (iii) alcohol $\rightarrow$ alkene $\rightarrow$ ether.
18. Explain the mechanism of acid-catalysed dehydration of ethanol to ethene.
19. Write a test to distinguish between: (i) n-propyl alcohol & isopropyl alcohol (ii) phenol & ethanol (iii) anisole (ether) & phenol.
20. Why is o-nitrophenol more acidic than o-methoxyphenol?
21. Why is the C–O bond shorter in phenol than in methanol?
22. How is phenol manufactured by the cumene process?
23. Give reactions of phenol: with bromine (bromination), with conc. HNO_3, with sodium metal, with NaOH.
24. How do you distinguish between ethanol and methoxyethane using chemical tests?
25. What is the difference in reactivity of aldehydes vs ketones toward nucleophilic addition?
26. What is the Cannizzaro reaction? Which aldehydes undergo it? Give equation.
27. Write the mechanisms / reaction steps for: (i) Wolff–Kishner reduction (ii) Clemmensen reduction.
28. What is the Etard reaction? Give conditions and products.
29. How to distinguish between propanal and propanone by chemical tests?
30. Give the oxidation products of ketones (especially unsymmetrical ones).

INVESTIGATORY PROJECT WORK:

To complete an Investigatory project and its write up in a separate file (List of investigatory projects is placed below. Cadets are supposed to submit the files of the projects cited against their names)

S No	Sch No	Investigatory Project (To Investigate upon)
1	5857	Cement manufacturing process
2	5862	Petroleum Refining in refineries
3	5867	Manufacturing of glass
4	5870	Study of organic food colours
5	5872	Manufacturing of Polymer - PVC
6	5873	Manufacturing of Polymer – Bakellite
7	5877	Manufacturing of Polymer –Nylon
8	5879	Manufacturing of Polymer -Polyester
9	5855	Manufacturing of Ethanol
10	5889	Use and Effects of Fertilizers
11	5892	Manufacturing of Toilet soap
12	5894	Manufacturing of Detergents and its uses
13	5899	Varieties of alcohol and their uses
14	5917	Manufacturing of Soft drinks and its side effects
15	5926	Preparation and uses of biodegradable polymers
16	5928	Manufacturing of stainless steel and its uses
17	5934	Manufacturing of Aromatic compounds, its use
18	5935	Manufacturing of Paints – Oil Paints
19	5936	Manufacturing of Paints – Water Paints
20	5940	Manufacturing of Ammonia
21	5951	Study of catalysts and their uses
22	5954	Softening of hard water
23	5957	Secondary cells/ Ni – Cad Cell & Pb storage battery
24	5958	Primary Cells – Dry cell and Mercury cell
25	5967	Cement manufacturing process
26	5855	Petroleum Refining in refineries
27	5856	Manufacturing of glass
28	5858	Study of organic food colours
29	5861	Manufacturing of Polymer - PVC
30	5876	Manufacturing of Polymer – Bakellite
31	5880	Manufacturing of Polymer –Nylon
32	5886	Manufacturing of Polymer -Polyester
33	5888	Manufacturing of Ethanol
34	5891	Use and Effects of Fertilizers
35	5901	Manufacturing of Toilet soap
36	5904	Manufacturing of Detergents and its uses
37	5907	Varieties of alcohol and their uses
38	5919	Manufacturing of Soft drinks and its side effects
39	5927	Preparation and uses of biodegradable polymers
40	5929	Manufacturing of stainless steel and its uses
41	5930	Manufacturing of Aromatic compounds, its use
42	5932	Manufacturing of Paints – Oil Paints
43	5933	Manufacturing of Paints – Water Paints
44	5939	Manufacturing of Ammonia
45	5942	Study of catalysts and their uses
46	5945	Cement manufacturing process

47	5952	Petroleum Refining in refineries
48	5956	Manufacturing of glass
49	5962	Study of organic food colours
50	5964	Manufacturing of Polymer - PVC
51	5965	Manufacturing of Polymer – Bakellite
52	5968	Manufacturing of Polymer –Nylon
53	D-226	Manufacturing of Soft drinks and its side effects

Note: The Investigatory File should contain the following pages
Page:1 Aim
Page:2 Introduction
Page:3 Requirements
Page:4 Theory
Page:5 Diagrams/Figures
Page:6 Equations if any
Page:7 Industrial / Domestic uses
Page:8 Conclusion
Page:9 References
(Strictly adhere to the projects given against your school number. This is for CBSE practical evaluation carrying 4 marks)

(Tony Abraham)
PGT Chemistry

Note: Kindly allocate the required number of questions.

SAINIK SCHOOL CHITTORGARH
WINTER VACATION HOLIDAY HOMEWORK-2025-26

INFORMATION	
SUBJECT NAME: PHYSICS	**CLASS & SECTION: XII (A,B)**
SUBJECT TEACHER NAME: Mr Onkar Singh, Mr Bhandarkar C L	
INSTRUCTIONS: Please prepare file in support of model. **Use your own creativity.** **Marks for Assignments and projects will be counted for Annual subject internal marks.**	

ASSIGNMENT

CHAPTER1: ELECTRIC CHARGES AND THE FIELDS

Content 1. Two charges q and -3q are placed on x-axis separated by distance 'd'. Where should a third charge 2q be placed such that, it will not experience any force?

Content 2. Sketch the electric field lines for a uniformly charged hollow cylinder.

Content 3. Draw the graph showing variation of electric field at the centre, on the surface and at a distance 'r' from the hollow charged conducting spherical shell.

Content 4. Four point charges 1μC ,-2 μC, 1μC, ,-2μ c are placed at the corners a,b,c, and d respectively, of a square of side 30 cm. Find the net force acting on a charge of 4 μC placed at the centre of the square?

Content 5. A charge 'q' is placed at the point of intersection of body diagonals of a cube. Calculate the electric flux passing through any one of its faces?

CHAPTER 2: ELECTROSTATIC POTENTIAL AND CAPACITANCE

Content 1. Content 1. A regular hexagon of side 10 cm has a charge 5 micro coulomb at each of its vertices. Calculate the potential at the centre of the hexagon?

Content 2. Three capacitors each of capacitance 9 Pf are connected in series.

(a) Find the total capacitance of the combination?

(b) What is the potential difference across each capacitor if the combination is connected to a 120 V supply.

Content 3. A 12 pF capacitor is connected to 50 V battery. How much electrostatic energy is stored in the capacitor?

Content 4. A variable capacitor is connected to a 200 V battery. If its capacitance is changed from 2μF to X μF the decrease in energy of the capacitor is 2x 10^{-2} J. Find the value of X?

Content 5. The capacitors, each 4 μF are to be connected in such a way that the effective capacitance of the combination is 6 μF. How this can be achieved?

CHAPTER 3: CURRENT ELECTRICITY

**Content 1.** A battery supplies 0.9 A current through a 2 Ω resistor and 0.3 A current

through a 7 Ω resistor when connected one by one. Find the internal resistance of the battery?

Content 2. If n, e, Τ and m have their usual meanings, then the resistance of a wire of length 'l' and cross-sectional area A is given by?

Content 3. Define temperature coefficient of resistance of a metal. Show the variation of resistivity of copper and semiconductor with temperature.

Content 4. Define current density and relaxation time.

Content 5.   Deduce the expression for equivalent emf of the combination, equivalent internal resistance and P.D. bet, the points A and B .
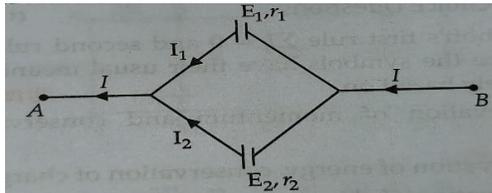
CHAPTER 4: <u>MOVING CHARGES AND MAGNETISM</u>

Content 1. Explain the significance of a radial magnetic field when a current carrying loop placed in a magnetic field?

Content 2. Two parallel conductors carrying current of 0.4 A and 10 A are placed 2.5 cm apart in vacuum. Find the force per unit length between them?

Content 3. What is the principle of a moving coil galvanometer? Define its current and voltage sensitivity?

Content 4. Briefly describe how the current sensitivity of MCG can be increased?

Content 5. What is magnetic moment and its direction? What is the effect on it when the radius of current carrying loop becomes four times?

CHAPTER 5: <u>MAGNETISM AND MATTER</u>

Content 1. Explain how the solenoid is equivalent to the bar magnet?

Content 2. Explain the property of diamagnetism and give an example.

Content 3. State the curie law? What is Curie temperature? Draw the graph of effect of temperature on paramagnetic substances?

Content 4. Distinguish between Diamagnetic, paramagnetic and ferromagnetic substances
(7 differences)?

Content 5. A steel wire of length of length L and magnetic dipole moment M is bent in the shape of semicircle. Then find its new magnetic moment?