SAINIK SCHOOL CHITTORGARH

SUMMER VACATION HOLIDAY HOMEWORK

INFORMATION	
SUBJECT NAME: MATHEMATICS	**CLASS & SECTION: XI A & XI B**
SUBJECT TEACHER NAME: MANISH JAIN	

INSTRUCTIONS:

1. Write with neat and clear handwriting on 100 page blank notebook.
2. Read all the questions carefully before solving.
3. Make near Borders on each page
4. Make a neat cover page with the following details:-

a. School Name – SAINIK SCHOOL CHITTORGARH (RAJASTHAN)

b. Title- HOLIDAY HOMEWORK – SUMMER VACATION

c. Submitted by:- (i). Student name (ii). Class (iii). School number (iv). Session – 2026- 27

d. Teacher's name

5. Deadline: Deadline for submitting the assignment is 01 July 2026.
6. Contact Information: 8233801284 (For assistance in holiday homework in case students have questions or need clarification)

ASSIGNMENT

CHAPTER 1 : SETS

Q.1. List all the elements of the following sets:

$$b = \left\{x : x = \frac{1}{2n-1}, 1 \le n \le 5\right\}$$

Q.2. Write the set $\left\{\frac{1}{2}, \frac{2}{5}, \frac{3}{10}, \frac{4}{17}, \frac{5}{26}, \frac{6}{37}, \frac{7}{50}\right\}$ in the set-builder form.

Q.3. In a group of 950 persons, 750 can speak Hindi and 460 can speak English. Find:

i. How many can speak both Hindi and English.

ii. How many can speak Hindi only.

Iii how many can speak English only

Q.4. A survey of 500 television viewers produced the following information;285 watch football, 195 watch hockey, 115 watch basketball, 45 watch football and basketball, 70 watch football and hockey, 50 watch hockey and basketball, 50 do not watch any of the three games. How many watch all the three games? How many watch exactly one of the three games?

Q.5. For any two sets A and B, prove the following:

$A \cap (A \cup B') = \phi$

Q.6. Prove that:

$(A \cup B) \times C = (A \times C) = (A \times C) \cup (B \times C)$

Q.8. Let A and B be sets. If $A \cap X = B \cap X = \Phi$ and $A \cup X = B \cup X$ for some set X,show that A = B.

Q.9. Using properties of sets show that

(i) $A \cup (A \cap B) = A$ (ii) $A \cap (A \cup B) = A$.

CHAPTER 2: RELATIONS AND FUNCTIONS

Q.10. Determine the domain and range of the relation R defined by R= {(x, x3): x is a prime number less than 10}

Q.11. Let A= {1, 2, 3,….,14}. Define a relation on a set A by R= {(x, y): 3x – y = 0, where x, y A}. Depict thisrelationship using an arrow diagram. Write down its domain, co-domain and range.

Q.12. If R = $\{(x, y) : x, y \in Z, x^2 + y^2 \leq 4\}$ is a relation defined on the set Z of integers, then write domain of R.

Q.13. If R is a relation from set A = {11, 12, 13} to set B = {8, 10, 12} defined by y = x − 3, the write R^{-1}.

Q.14. If A = {1, 2}, form the set A x A x A.

Q.15. Find the domain and range of the following real function:

(i) $f(x) = -|x|$

(ii) $(x) = \sqrt{9 - x^2}$

Q.16. Define a relation R on the set **N** of natural numbers by R = $\{(x, y): y = x + 5$, x is a natural number less than 4; $x, y \in$ **N**$\}$. Depict this relationshipusing roster form. Write down the domain and the range.

Q.17. Let f be the subset of $\mathbf{Z} \times \mathbf{Z}$ defined by $f = \{(ab, a + b): a, b \in \mathbf{Z}\}$. Is f afunction from **Z** to **Z**: justify your answer.

Q.18. Let A = {a, b}. List all relations on A and find their number.

CHAPTER 3 : TRIGONOMETRIC FUNCTIONS

Q.19. Convert 40° 20′ into radian measure.

Q.20. Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm. (use $\pi = 22/7$).

Q.21. If the arcs of the same lengths in two circles subtend angles 65°and 110° at the centre, find the ratio of their radii.

Q.22. If cos x = – 3/5 , x lies in the third quadrant, find the values of other five trigonometric functions.

Q.23. Find the value of cos (–1710°).

Q.24. Prove that :

$$\frac{\sin(x+y)}{\sin(x-y)} = \frac{tanx + tany}{\tan x - tany}$$

Q.25. Show that tan 3 x tan 2 x tan x = tan 3x – tan 2 x – tan x

Q.26. Prove that : $\cos\left(\frac{\pi}{4}+x\right)+\cos\left(\frac{\pi}{4}-x\right)=\sqrt{2}\,cosx$

Q.27. Prove that : $cos^2x+\cos^2\left(x+\frac{\pi}{3}\right)+\cos^2\left(x+\frac{\pi}{3}\right)+\cos^2\left(x-\frac{\pi}{3}\right)=\frac{3}{2}$

Q.28. Prove that : cos 6x = 32 $\cos^6$ x – 48$\cos^4$ x + 18 $\cos^2$ x – 1

Q.29 Prove: cos 4A = 1-8 $\cos^2$ A + 8 $\cos^4$ A

Q.30 Prove: tan 720°- cos 270°- sin 150° cos 120° = 1 /4

SAINIK SCHOOL CHITTORGARH
SUMMER VACATION HOMEWORK

SUBJECT NAME	
CLASS & SECTION: XI A&B	SUBJECT TEACHER NAME: GYANESHWAR SINGH
INSTRUCTIONS:	

ASSIGNMENT

1. Some basic concepts of chemistry
   Q.No.1.1 to 1.36 from NCERT book.
2. Structure of atoms
   Q.No.1.1,2.1 to 2.67 from NCERT book.
3. A project work of own choice.

SAINIK SCHOOL CHITTORGARH

SUMMER VACATION HOLIDAY HOMEWORK

COMPUTER SCIENCE	
CLASS & SECTION: XI	**SUBJECT TEACHER NAME: MR. UPENDRA KUMAR SINGH**
INSTRUCTIONS:PLEASE PREPARE A SEPARATE NOTEBOOK FOR HOME ASSIGNMENT	

ASSIGNMENT

Chapter-1 :Computer System overview

1. What is use of a bar code reader?
2. Give any two applications of biometric sensor?
3. Differentiate between primary memory and Secondary memory?
4. Name any three types of user interfaces?
5. Write full form of RAM,ROMCUI,GUI,EPROM,DVD,CD,IO,OMR,OCR,ALU
6. List functions of operating system.
7. What is the need of RAM? How does it differ from ROM?
8. Differentiate between compiler and interpreter ?.
9. What is device driver?
10 List name of input devices and output devices.
11. Write function of ALU,CU and MU in CPU.
12. Why CPU is called brain of computer?
13. What is differentiate between electronic and electrical devices.
14. Define a Bus .Also, name three types of bus.

Chapter : DATA REPRESENTATION AND ENCODING SYSTEM

1. Name any two number system that you know.
2. Why is the decimal Number system known as the base-10 system?
3. Name any two types of UNICODE encoding schemes.
4. Convert from decimal to Binary: 34,678,67,98,13,113,109,137
5. Convert from binary to decimal: 111001,10101001,100010011101111,101100111
6. Convert from decimal to octal: 34,67,123,789,234,567,342
7. Convert from octal to decimal: 567,32,113,204,231
8. Convert from decimal to hexadecimal : 123,786,349,112
9. Convert from hexadecimal to decimal: B2A,BC3,ABC
10. Why was Unicode developed ?

Chapter-3: BOOLEAN ALGEBRA

1. What is truth table?
2. using truth table verify “Involution Law”
3. Draw truth table for : A(B+C)
4. Draw logic circuit for XY’+XZ
5. State De Morgan’s laws.
6. Give a truth table for the Boolean Expression(X+Y’)’
7. Draw logic circuit for (a) X’.(Y’+Z) (b) A.(B+C’)
8. Draw a truth table of a 2- input NAND gate and a 3-input NAND gate
9. Verify one of De Morgan’s laws using a truth table
10. represent the Boolean expression XY’+YZ’ using only NAND gate.

Chapter-4: PROBLEM SOLVING STEPS

1. Define : (a) Algorithm (b) Pseudo code (c) Flowchart
2. Draw all symbols of flowchart components and also write their use
3. Write any three characteristics of an algorithm
4. Write pseudo code to check a number is odd or even
5. Draw a flowchart to read two numbers and print greater among two numbers.
6. Write algorithm to calculate factorial of a number and also draw flowchart.
7. Write pseudo code to print table of a number
8. Differentiate between flowchart and pseudo code
9. What do you mean by the term problem-solving cycle?
10. Write an algorithm to display the sum of the first 10 even numbers.

SAINIK SCHOOL CHITTORGARH

SUMMER VACATION HOMEWORK

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

ASSIGNMENT

Title of the Project:
"Courage Amidst the Storm: The Strength of Human Resilience"- Based on the chapter 'We're Not Afraid to Die… if We Can All Be Together'

Objective:
• To understand courage, resilience and teamwork.
• To inspire cadets to reflect on leadership qualities.

Guidelines:
1. Cover Page- Title, cadet details, illustrations or photographs
2. Introduction of the writer and summary of the lesson
3. Themes & Character Analysis
4. Research survival stories (Mention any three)
5. Interview activity- Interview an individual who has overcome adversity
6. Write a motivational speech on: "When Courage Becomes Our Compass."
7. Conclusion.
8. Bibliography.

Or

Title of the Project:
"Echoes of Love and Wisdom: Remembering Our Grandparents"- Based on the chapter 'The Portrait of a Lady'

Objective:
• To understand the emotional bond between generations as portrayed in The Portrait of a Lady.
• To appreciate the role of grandparents in shaping values, traditions, and emotional strength.
• To encourage cadets to reflect upon family relationships through observation, interviews and creative expression.

Guidelines:

1. Cover Page – Title, cadet details, illustrations or photographs
2. Introduction of the writer and summary of the chapter
3. Themes and Character analysis of protagonist
4. Research Component – Compare lifestyles of older and present generations.
5. Interview activity- Interview grandparents or elderly people.
6. Creative Expression – Poem/article titled “Lessons I Learnt from My Grandparents.”
7. Conclusion – Importance of respecting elders.
8. Bibliography.

Note: This project is a part of Internal Assessment. Submit your project file on 1 July, 2026.

SAINIK SCHOOL CHITTORGARH

SUMMER VACATION HOLIDAY HOMEWORK-2026-27

INFORMATION	
SUBJECT NAME: PHYSICS	**CLASS & SECTION: XI (A,B)**
SUBJECT TEACHER NAME: Mr Bhandarkar C L	
INSTRUCTIONS: Please prepare file in support of model. **Use your own creativity.** **Marks for projects will be counted for annual assessment.**	

ASSIGNMENT

CHAPTER 1:UNITS AND MEASUREMENT

Content 1. Find the Dimensions of Latent Heat and Specific Heat.
Content 2. . Write the number of significant figure in 0.000345.
Content 3. Write the advantages and disadvantages of SI. system of units.
Content 4. State the SI unit of solid angle and define it.
Content 5. Explain why dimensional analysis can be used to rule out incorrect physical formulae.
Content 6. Perform a dimensional analysis on the formula for the time period of a simple pendulum and derive it.
Content 7. Define the principle of homogeneity of dimensions. On What principle is it based?
Content 8. Q9 (NCERT): A book with many printing errors contains four different formulas for the displacement y of a particle undergoing a certain periodic motion:
(a) $y = a \sin 2\pi t/T$
(b) $y = a \sin vt$
(c) $y = (a/T) \sin t/a$
(d) $y = (a\ 2) (\sin 2\pi t / T + \cos 2\pi t / T)$
(a = maximum displacement of the particle, v = speed of the particle. T = time-period of motion). Rule out the wrong formulas on dimensional grounds.
Content 9. What are the limitations of using dimension analysis?
Content 10. The force acting on a body moving in a circular path depends on mass of the body(m), velocity(v) and radius(r) of the circular path. Obtain the expression for the force by dimensional analysis method. (Take value of k=1)
Content 11. Find the dimension of Gravitational constant?

CHAPTER 2:MOTION IN ASTRAIGHT LINE

Content 1. A boy on a stationary lift throws a ball upwards. Calculate the time for the ball to return to his hands. What happens if the lift starts moving upwards with a uniform speed?

Content 2. A stone is dropped from the top of a cliff and found to travel 44.1m before diving at the last second. What is the cliff's height? (g = 9.8m/s2)

Content 3. A balloon is ascending at the rate of 4.9m/s. A pocket is dropped from the balloon when situated at a height of 245m. How long does it take the packet to reach the ground? What is its final velocity?

Content 4. Establish the relation $S_N = u + a/2\ (2n - 1)$, where the letters have their usual meanings

Content 5. A particle is moving along a straight line and its position is given by the relation $x= t^3 -6t^2 -15t +40$

Find

a) The time at which velocity is zero.

b) Position and displacement of the particle at that point.

c) Acceleration

Content 6. By method of calculus derive three equations of uniformly accelerated motion.

Content 7. A particle moves in a straight line with a constant acceleration. It changes its velocity from 10 m/s^{-1} to 20 m/s^{-1} while passing through a distance 135 m in 't' second. Find the value of 't'?

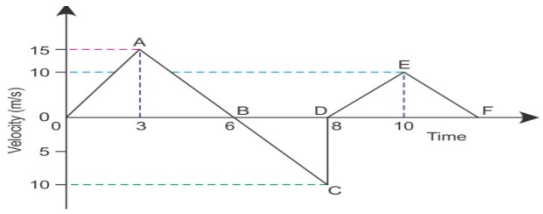
Content 8. On 60 km track, a train travels the first 30 km with uniform speed of 30 km/h. How fast the train travel next 30 km so as to average 40 km/h for the entire trip?

Content 9. What is instantaneous acceleration?

The displacement 'x' of a particle at time 't' along a straight line is given by $x=\alpha-\beta t+\gamma t^2$ Find acceleration 'a'?

Content 10. The velocity- time graph of a body is given below.

(i) The distance travelled by the body. (ii) The displacement of the body.



Prepare at least one model/project from the following: -

1. Hydraulic lift, hydraulic crane based on Pascals law.

2. Prepare a model visualizing circular motion in a vertical plane

3. Prepare model showing relation between centripetal force and the speed.

4. Show the types of flow of liquid—streamline ,turbulent etc.

(visit www.balesville.k12.in.us)

5.Using centre of mass concept making toy, lining tower.

(YOU MAY PREPARE MODEL/PROJECT OF UR CHOICE RELAVANT TO PHYSICS XI CLASS LEVEL.)MARKS WILL BE GIVEN FOR ANNUAL ASSESMENT.)

SAINIK SCHOOL CHITTORGARH
SUMMER VACATION HOMEWORK

BIOLOGY	
CLASS & SECTION: XI B	**SUBJECT TEACHER NAME: Dr. MANJIT SINGH**
INSTRUCTIONS:PLEASE PREPARE A SEPARATE NOTEBOOK FOR HOME ASSIGNMENT	

ASSIGNMENT

Chapter-8 :CELL : THE UNIT OF LIFE

1. Name the parts of bacterial flagella.
2. What do elaioplasts and aleuroplasts store ?
3. Who first saw and described a live cell ?
4. Which is the largest single cell ?
5. Who first explained that new cells arose from pre-existing cells ?
6. What are nuclear pores ? State their function.
7. List the functions of mesosome.
8. Differentiate between active and passive transport.
9. Differentiate between RER and SER.
10 List the functions of golgi apparatus.
11. What is plasmid ? What is its importance ?
12. Explain the Fluid Mosaic Model. Also represent it diagrammatically.
13. Differentiate between a prokaryotic and eukaryotic cell.
14. Diagrammatically represent the types of chromosomes based on the position of centromere.

Chapter 9 : BIOMOLECULES

1. Why are amino acids termed as alpha- amino acids?
2. What do you mean by Zwitter ion?
3. How does a peptide bond forms?
4. Describe the structure of Protein with diagram.
5. Name the abundant protein in animal and plant world
6. Why is starch showing blue black colour with iodine but cellulose does not ?
7. Describe the salient features of Double helix model of DNA.
8. What are the characteristic features of Enzyme.
9. Describe the induced fir mechanism of Enzyme action.
10. What do you mean by co factors? Differentiate between co enzyme and prosthetic group.

Chapter-10:CELL CYCLE AND CELL DIVISION

1. What is cell cycle ? Explain the events occurring in this cycle
2. Why is mitosis called Equational division ?
3. What happens during S phase of interphase ?
4. What is G_0 phase of cell cycle ?
5. Differentiate between cytokinesis of plant and animal cell.
6. What is chaismata ? State its significance.
7. Distinguish between metaphase of mitosis and metaphase I of meiosis
8. Describe the sub phases of Prophase –I of Meiosis .
9. Differentiate between mitosis and meiosis.
10. List the significance of mitosis and Meiosis.