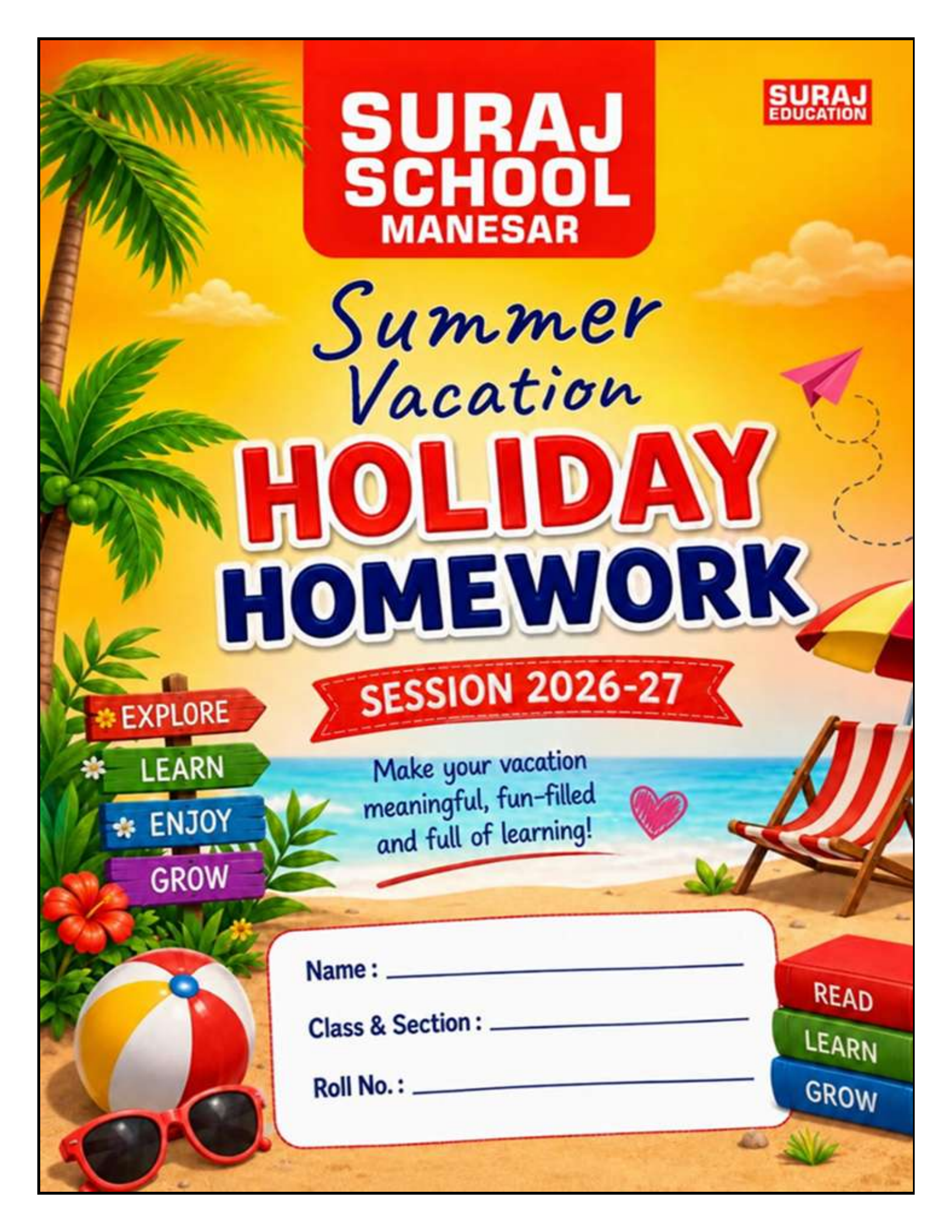


The cover features a vibrant beach scene with a palm tree on the left, a beach chair and umbrella on the right, and a beach ball with sunglasses in the bottom left. The background is a warm orange-yellow sky with clouds. The school name is in a red box at the top, and the title is in large, colorful letters in the center. A red banner indicates the session, and a motivational quote is written in a cursive font. A signpost on the left lists four activities: Explore, Learn, Enjoy, and Grow. A stack of books with the same four words is on the bottom right. The student information fields are in a white box at the bottom.

**SURAJ
SCHOOL
MANESAR**

**SURAJ
EDUCATION**

*Summer
Vacation*
**HOLIDAY
HOMEWORK**

SESSION 2026-27

Make your vacation
meaningful, fun-filled
and full of learning!

EXPLORE

LEARN

ENJOY

GROW

Name : _____

Class & Section : _____

Roll No. : _____

READ

LEARN

GROW

PHYSICS

A. Investigatory projects

1. To study the relation between angle of projection and range of projectile. – Rollno.- 1,6
2. To find out the value of acceleration due to gravity g at given place by using simple pendulum.- Rollno.- 2,7
3. To study the variation of time period of simple pendulum of a given length by taking bobs of different masses. Rollno.- 3,8
4. To study the dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time. Rollno.- 4,9
5. To study the loss in kinetic energy /potential energy for a bouncing ball on different surfaces. Rollno.- 5,10

B. Do NCERT and Exemplar numerical from chapters

1. Motion in straight line
2. Motion in plane
3. Laws of motion
4. Work energy power

Mathematics

Sets

1. If $A = \{x : x^2 - 5x + 6 = 0\}$ and $B = \{x : x^2 - 7x + 12 = 0\}$, find $A \cap B$ and $A \cup B$.
2. In a survey of 120 students, 70 like Mathematics, 55 like Physics and 30 like both. Find how many like neither subject.
3. Let $U = \{1,2,3,\dots,20\}$, $A = \text{multiples of 2}$, $B = \text{multiples of 3}$. Find $(A \cup B)'$.
4. Prove that $A - (B \cup C) = (A - B) \cap (A - C)$.
5. If $n(A)=20$, $n(B)=15$ and $n(A \cap B)=8$, find $n(A \cup B)$.
6. Verify De Morgan's laws using Venn diagrams.
7. Find the power set of $\{a,b,c\}$.

Relations and Functions

8. Check whether $R=\{(1,1),(2,2),(3,3),(1,2),(2,1)\}$ is an equivalence relation.
9. Find the domain and range of $f(x)=\sqrt{9-x^2}$.
10. Show that $f(x)=2x+3$ is one-one.
11. Determine whether $f(x)=x^2$ from $R \rightarrow R$ is onto.
12. Find fog and gof for $f(x)=2x-1$ and $g(x)=x^2$.
13. Find the greatest integer values of $[3.7]$ and $[-2.4]$.

14. Find the domain of $f(x)=\sqrt{(x-1)/(x-3)}$.

Complex Numbers

15. Simplify $(1+i)^{10}$.

16. Find the modulus and argument of $z = -1 + \sqrt{3}i$.

17. Express $(3+4i)/(1-2i)$ in the form $a+ib$.

18. Solve $x^2+6x+13=0$.

19. Find the square roots of -49 .

20. If $z_1=2+3i$ and $z_2=1-4i$, find z_1z_2 and z_1/z_2 .

21. Prove that $i^{4n}=1$ for all positive integers n .

22. Solve $x^2-4x+8=0$ and comment on nature of roots.

Linear Inequalities

23. Solve and represent on number line: $3x-7 \leq 2x+5$.

24. Solve: $|2x-3| < 5$.

25. Find solution set of $2 < x+1 \leq 7$.

26. Solve: $(x-2)/(x+1) \geq 0$.

27. Find all integers satisfying $-5 < 2x+1 \leq 9$.

28. Solve graphically on number line: $5-3x > 2x-10$.

29. Solve the inequality $x^2-5x+6 > 0$.

Permutations and Combinations

30. How many 5-digit numbers can be formed from digits 1,2,3,4,5,6 without repetition?

31. In how many ways can the letters of the word 'ARRANGE' be arranged?

32. Find the number of diagonals in a polygon of 15 sides.

33. How many committees of 4 members can be formed from 6 boys and 5 girls if at least 2 girls must be included?

34. Evaluate $10P_4$ and $10C_4$.

35. In how many ways can 8 persons sit around a circular table?

36. Find the number of ways in which the letters of the word 'MATHEMATICS' can be arranged.

37. A team of 5 is to be selected from 8 boys and 6 girls. Find the number of ways if at least 3 boys are included.

Binomial Theorem

38. Expand $(x+2y)^5$.
39. Find the coefficient of x^4 in $(2x-3)^6$.
40. Find the middle term in the expansion of $(1+x)^8$.
41. Find the term independent of x in $(x^2+1/x)^6$.
42. Using binomial theorem, expand $(1-2x)^5$.
43. Find the coefficient of x^3 in $(x+1/x)^8$.
44. Find the sixth term in expansion of $(a+b)^{10}$.
45. If the coefficients of $(1+x)^n$ are in the ratio 1:5:10, find n .
46. Prove that the sum of coefficients in expansion of $(x+2)^7$ is 3^7 .
47. Find the greatest coefficient in expansion of $(1+x)^{12}$.
48. Find the constant term in expansion of $(x^3+1/x^2)^7$.

Biology

A. Worksheet

1. Bryophytes are known as
 - a. Amphibians of plant kingdom
 - b. Flowering plants
 - c. Seed plants
 - d. Vascular plants
2. Prop roots are found in
 - a. Maize
 - b. Banyan
 - c. Mustard
 - d. Wheat
3. The arrangement of flowers on floral axis is called:
 - a. Venation
 - b. Aestivation
 - c. Inflorescence
 - d. Placentation
4. Fibrous roots are commonly found in:
 - a. Dicot plants
 - b. Monocot plants
 - c. Gymnosperms
 - d. Bryophytes

B. Fill in the blanks

- a. Algae contain... .. pigment for photosynthesis.
- b. Rhizoids are present in

- c. The swollen part of pistil is called.....
- d. Potato is a modification of.....

C. Very short answer type question

- a. Define inflorescence
- b. What are pneumatophores?
- c. Name the two stem modification
- d. What is placentation?

D. Short answer type questions

- a. Differentiate between tap root and fibrous root.
- b. Explain racemose and cymose inflorescence.
- c. Differentiate between monocot and dicot seeds.

E. Diagram practice

- a. Types of placentation
- b. Monocot seed
- c. Dicot seed

F. Activity work

Prepare a herbarium file with 5 locally available plants.
Collect different types of leaves and identify venation pattern.

G. Prepare a comparison chart on :

Algae , Bryophytes and pteridophytes

Chemistry

1. Complete NCERT questions of Ch-1 Some basic concepts of chemistry and Ch-2 Structure of atom

2. Make the formula sheets of both the chapters

3. Prepare the assignment in the given topics roll no wise:

A. Concentration Terms

B. Mole Concept

C. Molecular and Equivalent Mass

D. Electromagnetic Radiations

E. Bohr Model of an atom

F. Planck's Quantum Theory and Photoelectric effect

G. Bohr model and Hydrogen Spectra

H. Quantum Numbers

F. Aufbau and Pauli Exclusion Principle.

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ENGLISH

Instructions

- Complete all tasks in regular school notebook.
 - Write thoughtfully and honestly.
 - Use real-life observations and examples.
 - Creativity and originality will be appreciated.
-

1. Self-Discovery Journal

Write a reflective journal on:

“Who am I becoming?”

Include:

- Your strengths
- Weaknesses
- Current habits
- What kind of person you want to become

(300–400 words)

2. Interview a Professional

Interview any working professional:

Examples:

- Teacher
- Doctor
- Shopkeeper
- Engineer
- Farmer
- Business owner

Ask 10 meaningful questions related to:

- Career journey
- Challenges
- Lessons from life
- Skills needed for success

- interview.

Day	Hours Used	Purpose	Productive / Unproductive
-----	------------	---------	------------------------------

Then write:

“How technology is shaping my daily life.”

6. Real-Life Communication Challenge

Initiate meaningful conversations with 5 different people

Examples:

- Parents
- Grandparents
- Security guard
- Shopkeeper
- Younger sibling

Write what you learned from each interaction.

7. Community Responsibility Task

Perform one social contribution activity:

Examples:

- Teaching a younger child
- Helping someone with studies
- Assisting at home
- Helping an elderly person
- Cleaning a public area

Write a report on:

- What you did
 - Challenges faced
 - Experience gained
-

8. Critical Thinking Task

Write an article on:

“Is social media connecting people or isolating them?”

(400–500 words)

9. Vision Mapping

Prepare a creative page on:

“My Roadmap After Class 12”

Include:

- Career aspirations
 - Required skills
 - Obstacles
 - Action plan
-

10. Literature Reflection

Choose any one lesson from your English syllabus and write:

- Its relevance to modern life
- Life lesson learned
- Personal connection

(250–300 words)