



SHREE VASISHTHA VIDHYALAYA, CBSE

Summer Assignment 2026 - 27

Class-XI (Science)



Classes XI–XII

Dear Vashithians,

“The highest education is that which does not merely give us information but brings our lives in harmony with all existence.” — Rabindranath Tagore

As you step into the summer break, remember - this is not merely time away from school, but an opportunity to reconnect with yourself. It is a season to explore ideas, nurture curiosity, and grow beyond the boundaries of the classroom.

Learning does not pause; it simply transforms.

In moments of rest and play, in quiet reading and active exploration, and in reflection and creativity—true understanding unfolds. The holiday homework has been thoughtfully designed not as a checklist, but as a meaningful journey - a canvas where imagination meets logic and knowledge connects with real-life experiences.

Plan your time with intention. Set clear goals, prioritize wisely, and maintain a balanced routine. Equally important is the ability to pause, reflect, and rejuvenate - because a refreshed mind learns best. Stay organized, be consistent, and seek guidance whenever needed, for growth becomes richer when shared.

Let reading become your companion this summer. Choose any one novel from the following - Things Fall Apart, To Kill a Mockingbird, or Animal Farm and engage deeply with its ideas. Reflect, question, and articulate your understanding through a thoughtful review that captures both insight and perspective.

Stay connected with the world around you. Cultivate the habit of reading newspapers daily and create a scrapbook of articles, visuals, and ideas that inspire you. Express your thoughts as you reflect on issues shaping our society.

Aligned with the vision of the National Education Policy 2020, these experiences aim to nurture not only academic excellence but also creativity, critical thinking, and essential life skills. Education, after all, is not merely about acquiring knowledge - it is about understanding, questioning, and evolving.

To further enrich your learning journey, explore the SWAYAM platform - an initiative by the Ministry of Education, Government of India - offering a wide range of online courses by NCERT. Choose thoughtfully, learn independently, and broaden your horizons.

This summer, let curiosity guide you, discipline strengthen you, and creativity define you.

Read with depth.

Think with clarity.

Create with confidence.

Grow with purpose.

***Wishing you a meaningful
and magical summer!***

Warm regards,
SVV Family

“Summer brings the time to rest, But learning too can be at its Best!”

SUMMER ASSIGNMENT: 2026-27
CLASS: XI (SCIENCE STREAM)

General Instructions: -

1. All the subject assignments have to be done in separate files using project papers.
2. Submission date: - 15th June, 2026 (Monday)
3. The Summer Break is scheduled from 03rd May 2026 - 07th June, 2026. The students will resume the school from 5th June, 2026 (Friday).

Note: - These assignments are a part of your internal assessment & will be marked accordingly out of 10.

ENGLISH CORE (301)

- Q1. Discuss the relevance of the title *The Portrait of a Lady*.
- Q2. The grandmother had a divine beauty. How does the author bring it out?
- Q3. Comment on the tone of the poem (*A Photograph*)
- Q4. What kind of relationship did the narrator have with his grandmother?
- Q5. Explain the significance of the grandmother's portrait mentioned in the story.
- Q6. If you were the narrator, how would you describe your feelings toward the grandmother.
- Q7. Why does the poet say her mother laughed at the snapshot?
- Q8. What emotions does the poet experience when she looks at the photograph?
- Q9. Why is the Title appropriate of the lesson *We're not afraid to die if we can all be together*?
- Q10. Write the brief summary of the story '*The Summer of Beautiful White Horse*'.

PHYSICS (042)

- Q1. $y = x \ln x$. Find dy/dx .
- Q2. $y = (\sin x + \cos x)^2$. Find dy/dx .
- Q3. Differentiate $F(x) = (x^2 - 1)(x + 5)$.
- Q4. Differentiate $y = \sin x / \cos x$.
- Q5. Differentiate $y = x / \ln x$.
- Q6. Differentiate $y = \sin x / \cos x$.
- Q7. Differentiate $y = 6x^2/(2-x)$.
- Q8. Find the value of $\int 2x \cos (x^2 - 5)$
- Q9. Find the value of $\int \cos x + x \, dx$
- Q10. Integrate $1/(1+x^2)$ for limit $[0,1]$
- Q11. Find $\int (3x^2 + 2x + 1) \, dx$
- Q12. Check if the equation $v=u + at$ is dimensionally correct.
- Q13. How many significant figures are there in 0.004560?
- Q14. The velocity of water waves may depend on their wavelength λ , the density of water ρ and the acceleration due to gravity g . Using the method of dimensional analysis, derive the relation between λ , g , and ρ
- Q15. What are significant figures? State any two rules for determining significant figures. Give one example.

CHEMISTRY (043)

- Q1. What will be the mass of one atom of C12 in grams?
- Q2. What is the symbol for the SI unit of the mole? How is the mole defined?
- Q3. Calculate the mass percent of calcium, phosphorus and oxygen in calcium phosphate, $\text{Ca}_3(\text{PO}_4)_2$.
- Q4. 45.4 L of dinitrogen reacted with 22.7 L of dioxygen and 45.4 L of nitrous oxide was formed. The reaction is given below: $2\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{N}_2\text{O}(\text{g})$. Which law is being obeyed in this experiment? Write the statement of the law.
- Q5. If 4 g of NaOH dissolves in 36 g of H₂O, calculate the mole fraction of each component in the solution. Also, determine the molarity of solution (specific gravity of solution is 1 g ml^{-1}).

- Q6. Nickel atom can lose two electrons to form Ni^{2+} ion. The atomic number of nickel is 28. From which orbital will nickel lose two electrons?
- Q7. Calculate the total number of angular nodes and radial nodes present in the 3p orbital.
- Q8. How many neutrons and protons are there in the following nuclei? C, O, Mg, Cl.
- Q9. What is the difference between the terms orbit and orbital?
- Q10. Arrange s, p and d sub-shells of a shell in the increasing order of effective nuclear charge (Z_{eff}) experienced by the electron present in them
- Q11. Write electronic configuration of the following: Cu^{2+} , Cr^{3+} , Sc, P, Ca, Zn^{2+} .
- Q12. (a) How many sub-shells are associated with $n = 4$?
(b) How many electrons will be present in the sub-shells having m_s value of $-1/2$ for $n = 4$?
- Q13. Among the following pairs of orbitals, which orbital will experience more effective nuclear charge (i) 2s and 3s (ii) 4d and 4f (iii) 3d and 3p?
- Q14. (c) One electron is present in 4f subshell. What is the sum $n+l+m_l+m_s$ values assuming 'f' subshell follows -3 to $+3$ order of filling electron?
- Q15. Hydrogen gas is prepared in the laboratory by reacting dilute HCl with granulated zinc. Following reaction takes place: $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ Calculate the volume of hydrogen gas liberated at STP when 32.65 g of zinc reacts with HCl.
- Q16. The density of 3 molal solution of NaOH is 1.110 g mL^{-1} . Calculate the molarity of the solution.
- Q17. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction $2\text{A} + 4\text{B} \rightarrow 3\text{C} + 4\text{D}$, when 5 moles of A react with 6 moles of B, then
(i) Which is the limiting reagent?
(ii) Calculate the amount of C formed
- Q18. Define the law of multiple proportions. Explain it with two examples. How does this law point to the existence of atoms?
- Q19. Calcium carbonate reacts with aqueous HCl to give CaCl_2 and CO_2 according to the reaction given below: $\text{CaCO}_3(\text{s}) + 2\text{HCl}(\text{aq}) = \text{CaCl}_2(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
- Q20. A vessel contains 1.6 g of dioxygen at STP (273.15K, 1 atm pressure). The gas is now transferred to another vessel at a constant temperature, where pressure becomes half of the original pressure. Calculate:
(i) volume of the new vessel.
(ii) number of molecules of dioxygen.

MATHEMATICS (041)

- Q1. For two events A and B which of the following is simple expression of $(A \cap B) \cup (A \cap B)' \cup (A' \cap B)$
(a) $A \cap B$ (b) $A \cup B$ (c) $A' \cap B'$ (d) $A \cap B'$
- Q2. If $X \cup \{3,4\} = \{1,2,3,4,5,6\}$ then which of the following is true
(a) Smallest set $X = \{1,2,5,6\}$ (b) Smallest set $X = \{1,2,3,5,6\}$
(c) Smallest set $X = \{1,2,3,4\}$ (d) Greatest set $X = \{1,2,3,4\}$
- Q3. If $A = \{n^3 + (n+1)^3 + (n+2)^3 : n \in \mathbb{N}\}$ and $B = \{9n : n \in \mathbb{N}\}$, then
(a) $A \subset B$ (b) $B \subset A$ (c) $A = B$ (d) $A' = B$
- Q4. There are three sets as given in column-A and column-B
- | Column-A | Column-B |
|---|---|
| (1) $\{L, A, T\}$ | (A) $\{x \in \mathbb{Z}, x^2 < 5\}$ |
| (2) $\{x \in \mathbb{Z} \mid x^3 - x = 0\}$ | (B) $\{x \mid x \text{ is a letter of the word LATA}\}$ |
| (3) $\{-2, -1, 0, 1, 2\}$ | (C) $\left\{\sin 0, \sin \frac{3\pi}{2}, \tan \frac{5\pi}{4}\right\}$ |
- Which one of the following matches is correct?
(a) 1-A, 2-B, 3-C (b) 1-B, 2-A, 3-C (c) 1-B, 2-C, 3-A (d) 1-A, 2-C, 3-B
- Q5. If A and B are two sets then $B - (B - A) = \dots$
(a) $(A - B) - B$ (b) $A - (A - B)$ (c) A (d) B

- Q6. If set A is empty set then find $n[P[P(P(A))]]$.
- Q7. If $A = \{x \mid x^2 = 1\}$ and $B = \{x \mid x^4 = 1\}$ then $(A - B) \cup (B - A)$.
- Q8. If $U = \{1,2,3\}$ and $A = \{1,2\}$, then $P(A)$.
- Q9. Two finite sets have m and n elements respectively. The total number of subsets of first set is 112 more than the total number of subsets of the second set. Find the values of m and n .
- Q10. Suppose sets A_i ($i = 1,2,\dots,60$) each having 12 elements and set B_j ($j = 1,2,3,\dots$) each having 4 elements. If $\bigcup_{i=1}^{60} A_i = \bigcup_{j=1}^n B_j = C$ and each element of C belongs to exactly 20 of A_i 's and exactly 18 of B_j 's, then find n .
- Q11. If $A = \{1,3,5,7,9,11,13,15,17\}$, $B = \{2,4,\dots,18\}$ and N is the universal set, then find $A' \cup (A \cup (B \cap B'))'$
- Q12. Let U be the universal set and $A \cup B \cup C = U$. Then simplify $[(A - B) \cup (B - C) \cup (C - A)]'$
- Q13. Prove that $(A \cup B \cup C) \cap (A \cap B' \cap C') \cap C' = B \cap C'$
- Q14. Taking $U = [1,5]$, $A = \{x \mid x \in \mathbb{N}, x^2 - 6x + 5 = 0\}$, find A' .
- Q15. If A is the set of even natural numbers less than 8 and B is the set of prime numbers less than 7, then find the number of relations from A to B .
- Q16. $R = \{(x, y) \mid x, y \in \mathbb{Z}, x^2 + y^2 \leq 4\}$ is a relation in \mathbb{Z} then find the domain of R .
- Q17. Let R be a relation on \mathbb{N} defined by $R = \{(x, y) \mid x + 2y = 8\}$, then find domain of R
- Q18. If $n(A) = 3$, $n(B) = 5$ and $n(A \cap B) = 2$, then find $n[(A \times B) \cap (B \times A)]$
- Q19. If $f(x)$ is a polynomial satisfying $f(x)f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right)$ and $f(3) = 28$, then find $f(4) = \underline{\hspace{2cm}}$.
- Q20. Let R be a relation in \mathbb{N} defined by $R = \{(1 + x, 1 + x^2) \mid x \leq 5, x \in \mathbb{N}\}$ which of the following is false?
 (a) $R = \{(2,2), (3,5), (4,10), (5,17), (6,26)\}$
 (b) Domain of $R = \{2,3,4,5,6\}$
 (c) Range of $R = \{2,5,10,17,26\}$
 (d) (b) and (c) are true

BIOLOGY (044)

- Q1. A biologist discovers a new unicellular organism that has a nucleus and moves with the help of cilia. It contains chlorophyll and can perform photosynthesis in sunlight, but in darkness it ingests organic particles for nutrition. According to the five-kingdom classification, why would placing this organism in a single kingdom be problematic? Analyse the difficulties a taxonomist would face in classifying such an organism. Based on your understanding of the five-kingdom system, which kingdom would be the most appropriate for its temporary placement and why?
- Q2. If all the 70S ribosomes of a eukaryotic cell were to be destroyed, would the cell survive? Explain the role of 70S and 80S ribosomes in different cellular compartments, and analyse the immediate and long-term effects of such an event on the cell's protein synthesis machinery.
- Q3. A patient is suffering from an infection caused by a bacterium that lacks a peptidoglycan cell wall, has a cell membrane composed of branched hydrocarbon chains linked to glycerol by ether bonds, and can survive in high salt concentrations. To which group of Kingdom Monera does this pathogen belong? Justify your identification and suggest why common antibiotics like penicillin are ineffective against it.
- Q4. An ecologist observes that two morphologically similar bird species live in the same forest but never interbreed. However, in a zoo, they are forced to cohabitate and produce sterile hybrids. Should these two populations be considered separate species? Analyse this situation using the biological species concept and discuss the limitations of this concept in classifying such populations.
- Q5. A student argues that a herbarium is more useful than a botanical garden for detailed taxonomic studies, while another student claims the opposite. Evaluate both viewpoints with respect to the study

of morphological and anatomical features. Which taxonomical aid would you recommend for a researcher studying the evolutionary relationships among plants, and why?

- Q6.** If a drug is discovered that specifically targets and inhibits the function of mesosomes in bacteria, what effect would it have on the bacterial cell? Would it affect any eukaryotic cell organelle? Explain the likely consequences for bacterial respiration and cell division.
- Q7.** A new virus is discovered that has a single-stranded RNA genome but lacks a protein coat. It is found to infect only plants. How would you classify this entity among viruses, viroids, and prions? Justify your classification based on its structural features and host range.
- Q8.** During a plasmolysis experiment, a student places a *Rhoeo* leaf peel in a concentrated sugar solution. After 10 minutes, the protoplast shrinks and detaches from the cell wall. The student then transfers the peel to distilled water, but no change is observed even after 20 minutes. What could be the possible reasons for the failure of deplasmolysis? Analyse the role of the tonoplast and the cell wall in this phenomenon.
- Q9.** A taxonomist is revising the classification of the genus *Solanum*. She finds that *Solanum tuberosum* (potato) and *Solanum melongena* (brinjal) share many common characteristics but also show significant differences in fruit morphology and flower colour. At which taxonomic level would you place the differences between these two plants, and why? Explain how the hierarchical system of classification accommodates such variations within a single genus.
- Q10.** A biochemist isolates a membrane-bound organelle from a plant cell. It has its own circular DNA, 70S ribosomes, and produces ATP. However, it also contains small amounts of chlorophyll. Is this a mitochondrion, a chloroplast, or an intermediate organelle? Analyse the evidence and predict the origin of such an organelle.

Q11. Read the following passage and answer the questions that follow:

The taxonomic hierarchy is a fundamental concept in biological classification. As we ascend from species to kingdom, the number of shared characteristics among organisms decreases. For example, all members of the genus *Panthera* share specific features such as a rounded head, retractile claws, and a roaring ability. However, when we consider the order Carnivora, the shared characteristics become more general, such as the presence of carnassial teeth. This hierarchical arrangement helps in understanding the degree of relationship among organisms.

Questions:

- Why do members of a species share the maximum number of common characteristics?
- Give an example of a characteristic that is common to all members of the class Mammalia but not to all members of the phylum Chordata.
- If two organisms belong to the same family, what can you infer about their relationship compared to two organisms belonging to the same order?
- In the scientific name *Panthera leo*, what do the two parts represent, and why is the first part capitalised while the second is not?

Q12. Read the following passage:

Scientists have discovered a microorganism in the hydrothermal vents of the Pacific Ocean. It thrives at temperatures exceeding 100°C and in highly acidic conditions (pH 2–3). The organism lacks peptidoglycan in its cell wall and its cell membrane contains isoprenoid chains linked to glycerol by ether bonds. It is autotrophic and uses inorganic sulphur compounds for energy.

Questions:

- To which major group of Kingdom Monera does this organism belong? Name the specific subgroup.
- Why is this organism not classified under Eubacteria? Give two reasons.
- How do its membrane lipids differ from those of typical bacteria, and what is the adaptive significance of this difference?
- What would happen if this organism were exposed to an antibiotic that inhibits peptidoglycan synthesis? Why?

Q13. Read the following passage:

A mycologist is studying a fungus that grows on bread. Under the microscope, he observes non-septate, coenocytic mycelium. The fungus reproduces asexually by producing sporangiospores inside a spherical structure, and sexually by forming a zygospore. The zygospore is thick-walled and can remain dormant for long periods.

Questions:

- Identify the class of this fungus and justify your answer with two features.
- How does the asexual reproduction of this fungus differ from that of an ascomycete like *Penicillium*?
- What is the ploidy of the zygospore, and how does it germinate?
- Why is this fungus placed under Kingdom Fungi and not under Kingdom Plantae?

Q14. Read the following passage:

A medical student observes a Gram-stained bacterial smear under a microscope. Some bacteria appear purple, while others appear pink. The purple ones have a thick layer of peptidoglycan in their cell wall, while the pink ones have a thin peptidoglycan layer and an additional outer membrane containing lipopolysaccharides.

Questions:

- Identify the two types of bacteria based on Gram staining.
- Why do the purple bacteria retain the crystal violet-iodine complex?
- What is the role of the outer membrane in the pink bacteria, and how does it contribute to antibiotic resistance?
- If a drug destroys the plasma membrane, would it affect both types equally? Justify.

Q15. Read the following passage:

Mitochondria are often called the 'powerhouses' of the cell. They have a double membrane structure, with the inner membrane folded into cristae. The matrix contains circular DNA, 70S ribosomes, and enzymes for the Krebs cycle. Mitochondria can divide independently of the nucleus.

Questions:

- Why are mitochondria considered semi-autonomous organelles?
- What is the significance of the folded inner membrane (cristae) in mitochondria?
- If a cell is treated with a drug that inhibits the 70S ribosomes of mitochondria, what will be the immediate and long-term effects on the cell?
- How does the presence of circular DNA in mitochondria support the endosymbiotic theory?

Q16. Read the following passage:

The nucleus is the control centre of the eukaryotic cell. It is bounded by a double membrane called the nuclear envelope, which contains nuclear pores. Inside the nucleus, the genetic material is organised into chromosomes. A dense, spherical structure called the nucleolus is also present.

Questions:

- What is the function of the nuclear pores?
- What is the nucleolus, and what is its primary role?
- If the nuclear envelope is damaged, how would it affect the cell's gene expression?
- Why do prokaryotic cells not have a true nucleus, yet they still perform all life functions?

Q17. List all the taxonomic categories from the most inclusive to the most exclusive. Write the correct scientific name of the national bird of India, following all rules of binomial nomenclature.

Q18. State the five kingdoms proposed by Whittaker. For each kingdom, write one characteristic feature and one example.

Q19. Why are mitochondria and chloroplasts called 'semi-autonomous' organelles? Explain the significance of their own DNA and ribosomes.

Q20. A plant cell is placed in a hypertonic solution. Describe the sequence of changes that will occur, including the terms 'plasmolysis' and 'turgor pressure'. How would the outcome differ if the same experiment were done with an animal cell?

Q21. Analyse the statement: "All living organisms are made of cells, but some organisms are not truly cellular." Provide examples from the chapter on Biological Classification and explain how these exceptions challenge the cell theory.

- Q22.** Evaluate the five-kingdom classification system in light of the discovery of organisms like *Euglena* that have both plant-like and animal-like characteristics. Do you think the Kingdom Protista satisfactorily accommodates such organisms? Provide at least 5 points to support your evaluation.
- Q23.** Create a hypothetical new kingdom of life that includes only multicellular, photosynthetic, eukaryotic organisms that lack a cell wall. Describe four unique characteristics of this kingdom. Then, create a dichotomous key (with at least 5 couplets) that would allow a student to distinguish an organism from this new kingdom from a typical plant, an animal, and a fungus.

Q24. Read the following passage:

The endomembrane system of a eukaryotic cell includes the endoplasmic reticulum (ER), Golgi apparatus, lysosomes, and vacuoles. The rough ER (RER) has ribosomes attached to its surface and is involved in protein synthesis, while the smooth ER (SER) lacks ribosomes and is involved in lipid synthesis and detoxification.

Questions:

- Why is the RER called 'rough'?
- What would happen to a cell if the Golgi apparatus were to stop functioning?
- How do the products synthesised in the RER reach the Golgi apparatus?
- Why is the SER abundant in liver cells?

Q25. Read the following passage:

Viruses are acellular entities that can replicate only inside living host cells. They consist of a protein coat called a capsid and a genetic material, which may be DNA or RNA. Some viruses, like the influenza virus, also have an outer envelope derived from the host cell membrane.

Questions:

- Why are viruses not included in the five-kingdom classification?
- Distinguish between a virus and a viroid in terms of their genetic material.
- What is the role of the capsid in a virus?
- Why are viruses considered 'obligate intracellular parasites'?

INFORMATICS PRACTICES (065)

- Q1.** Create a Python program for a *Shopping Mall Invoice Generator* that takes product name, price, and quantity for 3 to 5 items.
- Calculate the total amount, discount (10%), and net payable amount.
 - Display the output in a proper invoice format like a shopping mall. Use input() function, suitable variables, and arithmetic operators as per requirements, and apply proper string formatting.
 - Add your name as the mall name or include "Designed By: Your Name" in the output.

===== FINAL INVOICE =====			
Product	Price	Qty	Total
Shirt	1000	2	2000
Jeans	1200	1	1200
Shoes	1500	1	1500
Grand Total:			4700
Discount (10%):			470.0
Net Payable:			4230.0
THANK YOU! VISIT AGAIN			

PHYSICAL EDUCATION (048)

- Q1. Write a short profile of any famous sportsperson who turned their career into a profession in physical education (e.g., Neeraj Chopra or P. V. Sindhu).**
- Include:
- Early life
 - Achievements
 - Contribution to sports
- Q2. How does Physical Education help in life?**

ARTIFICIAL INTELLIGENCE (843)

- Q1. Creating a PowerPoint presentation on artificial intelligence (AI).
Title: "Artificial Intelligence: A Journey into Intelligent Machines"
OR
Responsible Digital Citizenship"**

OR

"Impact of Technology on Society

- Q2. 1) Define artificial intelligence (AI) and explain its significance in modern society.
2) Describe the role of AI in various fields such as healthcare, finance, transportation, and education.
3) What are the major challenges in the development and adoption of AI technology?
4) Compare and contrast supervised, unsupervised, and reinforcement learning algorithms.
5) Research and write a report on the applications of AI in a specific industry of your choice (e.g., healthcare, finance, agriculture). Discuss how AI technology is currently being used in that industry and its potential impact on productivity and innovation.**

PHYCOLOGY (037)

- Q1 1) Watch movie "The Joker" and analysis the psychological factors, disorder and condition of the main character.
2) Imagine if you have a chance to change something in movie in the main character to make better ending what it would be?
3) If you will find out any condition of someone same as main character,
4) Will you help them or ignore?
5) If yes how and why?
6) Create story of 300 words "The joker" according your perspective. The Disorder and main Character will be same?**

Answer the following Questions

- 1) Describe the evolution of psychology as discipline?
- 2) Discuss the Branches of Psychology with examples?
- 3) What is Difference between psychologist and psychiatrist?
- 4) Mention Five applications of psychology in daily life?