



### Class-XI (Science)

## Summer Assignment 2025 - 26

*Classes XI–XII*

*Dear Students,*

*As the summer sun shines brighter and the days grow longer, it's time to pause, relax, and recharge. The summer break offers a wonderful opportunity to reflect, grow, and stay creatively engaged.*

*To keep the spirit of learning alive, we've designed interesting, research-based holiday homework that encourages independent thinking and curiosity. Remember, every learner is unique — and progress matters more than perfection.*

#### *Read & Rise!*

*Use this break to explore books that inspire and build character:*

- *You Can Win – For self-motivation*
- *Ikigai – To discover your purpose*
- *The Secret – To adopt positive thinking*
- *Eat That Frog – To overcome procrastination*

*Reading a few pages each day can go a long way in shaping your mindset and habits.*

#### *Smart Break Tips:*

- *Balance your day with study, rest, and hobbies*
- *Prioritize important tasks and work steadily*
- *Maintain a clean and focused study space*
- *Don't hesitate to ask for help when needed*
- *Be consistent — little progress each day adds up*

#### *Enjoy, Learn, and Grow*

*Make the most of your time — rest well, explore something new, and return refreshed with fresh energy and a positive mindset. Your effort and enthusiasm today shape your success tomorrow.*

*Wishing you a joyful and productive summer break!*

*Warm regards,*

*SVV Family*

*Wishing you a meaningful and magical summer!*

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

# SUMMER ASSIGNMENT: 2025-26

## Class: XI (Science Stream)

### General Instructions:-

1. All the subject assignments have to be done in separate files using project papers.
2. Submission date:- 13<sup>th</sup> June, 2025 (Friday)
3. The Summer Break is scheduled from 04<sup>th</sup> May 2025 - 05<sup>th</sup> June, 2025. The students will resume the school from 6<sup>th</sup> June, 2025 (Friday).

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

### ENGLISH CORE (301)

- Q1.** You are Manisha of 10, Rajaji Nagar, Bangalore. You want a Maths teacher for your son who is a class 10 student. Draft a suitable advertisement in not more than 50 words stating your requirements.
- Q2.** You are General Manager of Ivy Software Solutions, Agra Cantt, Agra. You need a software engineer for your organisation. Draft an advertisement in not more than 50 words to be published in 'The Times of India' under the classified columns.
- Q3.** You are Ramanujam/Revathi, a student of Class XII, St. Xavier's School, Jhansi. You are interested in giving tuition in Maths to one or two students of class VIII. Draft an advertisement in not more than 50 words for a local newspaper.
- Q4.** Animals recognize and value a relationship established with human beings. Explain this by keeping in mind the relationship established by Khushwant Singh's grandmother with animals and birds.
- Q5.** A life of dedication and integrity can be lived even without college or university level education as the grandmother demonstrates. Elaborate
- Q6.** Discuss the advantages and disadvantages of the joint family system. What values do you think children learn from grandparents?
- Q7.** The chapter "The Portrait of a Lady" displays the sad reality of old age. Old people face loneliness and seclusion. It gets you thinking about the pain of old age. Write an article about 'Pain of Old Age'
- Q8.** How does the story 'The Summer of the Beautiful White Horse' convey the message of honesty and integrity and how do the characters maintain it irrespective of their desire to keep the horse with themselves? What other human values did the two young boys reflect in their character?
- Q9.** "Both wry with the labored ease of loss". The poet is missing her mother. What is the role of the mother in forming the personality of a child?
- Q10.** Aram justified the act of stealing the horse as he didn't consider it to be stealing. In fact he was Mourad's partner in crime. What would you have done if such a situation confronted you?

### PHYSICS (042)

- Q1.** The base quantity among the following is  
(1) Speed (2) Weight (3) Length (4) Area
- Q2.** Which of the following is a unit that of force?  
(1) N m (2) N (3) N/m (4) N s
- Q3.** The number of significant figures in a pure number 410 is  
(1) Two (2) Three (3) One (4) Infinite
- Q4.** The number of significant figures in the measured value 0.0204 is  
(1) Five (2) Three (3) Four (4) Two
- Q5.** The number of significant figures in the measured value 26000 is  
(1) Five (2) Two (3) Three (4) Infinite
- Q6.** The number of significant zeroes present in the measured value 0.020040, is  
(1) Five (2) Two (3) One (4) Three
- Q7.** The number of significant figures in the measured value 4.700 m is the same as that in the value  
(1) 4700 m (2) 0.047 m (3) 4070 m (4) 470.0 m

- Q8.** The escape velocity  $v$  of a body depends on– (i) the acceleration due to gravity ‘ $g$ ’ of the planet, (ii) the radius  $R$  of the planet. Establish dimensionally the relation for the escape velocity.
- Q9.** A calorie is a unit of heat energy and it equals about 4.2 J, where  $1 \text{ J} = 4.2 \text{ kg m}^2 \text{ s}^{-2}$ . Suppose we employ a system of units in which the unit of mass equals  $\alpha \text{ kg}$ , the unit of length equals  $\beta \text{ m}$ , the units of time is  $\gamma \text{ sec}$ . show that a calorie has a magnitude  $4.2 \alpha^{-1} \beta^{-2} \gamma^2$  in terms of the new units.
- Q10.** A famous relation in physics relates moving mass  $m$  to the rest mass  $m_0$  of a particle in terms of its speed  $v$  and the speed of the light  $c$ . A boy recalls the relation almost correctly but forgets where to put the constant  $c$ . He writes:  $m = m_0 / (1 - v^2)^{1/2}$  Guess where to put the missing  $c$ .
- Q11.** If  $E, M, J$  and  $G$  respectively denote energy, mass, angular momentum and gravitational constant, Calculate the dimensions of  $EJ^2 / M^5 G^2$
- Q12.** What is meant by significant figures .State the rules for counting the number of significant figures in a measured quantity?
- Q13.** Give limitations of dimensional analysis.
- Q14.** The dimensional formula for electric field is  
 (1)  $[M^1 L^1 I^{-2} T^{-3}]$                       (2)  $[M^1 L^2 I^{-1} T^{-3}]$                       (3)  $[M^{-1} L^1 I^1 T^{-3}]$                       (4)  $[M^1 L^1 I^{-1} T^{-3}]$
- Q15.** Find  $dy/dx$  of the function  
 (i)  $y = \sin(ax^2 + b)$       (ii)  $y = e^{2x} \log x$

### CHEMISTRY (043)

- Q1.** What will be the mass of one atom of  $C^{12}$  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  $\text{H}_2\text{O}$ , calculate the mole fraction of each component in the solution. Also, determine the molarity of solution (specific gravity of solution is  $1 \text{ g ml}^{-1}$ )
- Q6.** Nickel atom can lose two electrons to form  $\text{Ni}^{2+}$  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 ( $Z_{\text{eff}}$ ) experienced by the electron present in them.
- Q11.** Write electronic configuration of the following:  
 $\text{Cu}^{2+}$ ,  $\text{Cr}^{3+}$ , Sc, P, Ca,  $\text{Zn}^{2+}$ .
- 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.** (a) A neutral atoms has 2K, 8L and 15M electrons. Find the total numbers of electrons in s, p, d and f subshell.  
 (b) How many unpaired electrons are present in the following ions  $\text{Al}^{+3}$ ,  $\text{Co}^{+3}$ ,  $\text{Mn}^{+2}$  (Given Atomic number: Al=13, Co=27 & Mn =25)  
 (c) One electron is present in 4f subshell. What is the sum  $n+l+m_s$  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:  $Zn + 2HCl \rightarrow ZnCl_2 + H_2$   
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  $1.110 \text{ g mL}^{-1}$ . Calculate the molarity of the solution.
- Q17.** The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction  $2A + 4B \rightarrow 3C + 4D$ , 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:  
 $CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$   
What mass of  $CaCl_2$  will be formed when 250 mL of 0.76 M HCl reacts with 1000 g of  $CaCO_3$ ? Name the limiting reagent. Calculate the number of moles of  $CaCl_2$  formed in the reaction.
- 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.** Write the following sets in roster form:  
(i)  $A = \{x : x \text{ is an integer and } -3 \leq x < 7\}$   
(ii)  $B = \{x : x \text{ is a natural number less than 6}\}$
- Q2.** Given that  $N = \{1, 2, 3, \dots, 100\}$ , then  
(i) Write the subset A of N, whose elements are odd numbers.  
(ii) Write the subset B of N, whose elements are represented by  $x + 2$ , where  $x \in N$ .
- Q3.** Let  $U = \{1, 2, 3, 4, 5, 6\}$ ,  $A = \{2, 3\}$  and  $B = \{3, 4, 5\}$ .  
Find  $A'$ ,  $B'$ ,  $A' \cap B'$ ,  $A \cup B$  and hence show that  $(A \cup B)' = A' \cap B'$ .
- Q4.** Let  $U = \{1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{2, 4, 6\}$ ,  $B = \{3, 5\}$  and  $C = \{1, 2, 4, 7\}$ ,  
find (i)  $A' \cup (B \cap C')$  (ii)  $(B - A) \cup (A - C)$
- Q5.** Let  $U = \{x : x \in N, x \leq 9\}$ ;  $A = \{x : x \text{ is an even number, } 0 < x < 10\}$ ;  $B = \{2, 3, 5, 7\}$ .  
Write the set  $(A \cup B)'$ .
- Q6.** In a survey of 600 students in a school, 150 students were found to be drinking Tea and 225 drinking Coffee, 100 were drinking both Tea and Coffee. Find how many students were drinking neither Tea nor Coffee.
- Q7.** Use the properties of sets to prove that for all the sets A and B,  $A - (A \cap B) = A - B$
- Q8.** Find the value of  $\sqrt{3} \operatorname{cosec} 20^\circ - \sec 20^\circ$ .
- Q9.** Show that  $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$ .
- Q10.**  $\cos^2 x + \cos^2 \left(x + \frac{\pi}{3}\right) + \cos^2 \left(x - \frac{\pi}{3}\right) = \frac{3}{2}$
- Q11.** Find the value of  $\cos 570^\circ \sin 510^\circ + \sin (-330^\circ) \cos (-390^\circ)$ .
- Q12.** A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?
- Q13.** Find the radius of the circle in which a central angle of  $60^\circ$  intercepts an arc of length 37.4 cm.  
(use  $\pi = 22/7$ ).
- Q14.** Express the function  $f: A \rightarrow R, f(x) = x^2 - 1$ . Where  $A = \{-4, 0, 1, 4\}$  as a set of ordered pairs.
- Q15.** Assume that  $A = \{1, 2, 3, \dots, 14\}$ . Define a relation R from A to A by  $R = \{(x, y) : 3x - y = 0, \text{ such that } x, y \in A\}$ . Determine and write down its range, domain, and codomain.
- Q16.** Let  $f(x) = x^2$  and  $g(x) = 2x + 1$  be two real functions.  
Find  $(f + g)(x)$ ,  $(f - g)(x)$ ,  $(fg)(x)$ ,  $(f/g)(x)$
- Q17.** The Cartesian product  $A \times A$  has 9 elements among which are found  $(-1, 0)$  and  $(0, 1)$ . Find the set A and the remaining elements of  $A \times A$ .

- Q18.** Find  $x$  and  $y$  if:  
 (i)  $(4x + 3, y) = (3x + 5, -2)$       (ii)  $(x - y, x + y) = (6, 10)$
- Q19.** Let  $A = \{1, 2, 3\}$ ,  $B = \{4\}$  and  $C = \{5\}$   
 (i) Verify that:  $A \times (B - C) = (A \times B) - (A \times C)$   
 (ii) Find  $(A \times B) \cap (A \times C)$
- Q20.** In each of the following cases, find  $a$  and  $b$ .  
 (i)  $(2a + b, a - b) = (8, 3)$   
 (ii)  $\{a/4, a - 2b\} = (0, 6 + b)$

## BIOLOGY (044)

**Instructions:** • Answer all questions sequentially.

• Draw diagrams wherever necessary.

• Ensure clarity and proper labeling in diagrams.

### Section A: Very Short Answer Questions

- Q1.** Why is it difficult to define "living organisms" precisely?
- Q2.** How does taxonomy help in biodiversity conservation?
- Q3.** Differentiate between species and genus with an example.
- Q4.** Why are viruses considered at the "edge of life"?
- Q5.** Name the kingdom where organisms have both autotrophic and heterotrophic nutrition.
- Q6.** What is the significance of binomial nomenclature?
- Q7.** What is a key characteristic that distinguishes Monera from Protista?
- Q8.** State one major drawback of the two-kingdom classification.
- Q9.** Why are cyanobacteria also called "blue-green algae"?
- Q10.** Write one reason why slime moulds are considered protists despite their fungal characteristics.

### Section B: Short Answer Questions

- Q11.** Describe the three domains of life proposed by Carl Woese.
- Q12.** Differentiate between Mycoplasma and Bacteria.
- Q13.** How do lichens serve as indicators of pollution?
- Q14.** Discuss why classification systems keep changing with time.
- Q15.** Give a comparative account of Archaeobacteria and Eubacteria.
- Q16.** What role do diatoms play in the aquatic ecosystem?
- Q17.** State two limitations of Whittaker's five-kingdom classification.
- Q18.** Discuss the major characteristics used in modern taxonomy for classification.
- Q19.** What is systematics? How is it different from classification?
- Q20.** Why are Euglena placed under Protista and not under Plantae?

### Section C: Long Answer Questions (4-5 marks each)

- Q21.** Write an account of Kingdom Fungi with suitable examples, highlighting their mode of reproduction.
- Q22.** Describe the features that distinguish Kingdom Monera from Kingdom Protista.
- Q23.** Explain the term "biological concept of species". Why is it significant?
- Q24.** Discuss the major differences between viroids, viruses, and lichens.
- Q25.** Draw a neat and labeled diagram of a bacterial cell and explain the function of its components.
- Q26.** Explain the structure and reproduction of slime moulds. Why are they considered unique?
- Q27.** What are the universal rules of nomenclature? Explain with two examples.
- Q28.** Discuss the economic importance of algae with suitable examples.
- Q29.** Differentiate between classification by Whittaker and the three-domain classification by Carl Woese.
- Q30.** Explain the concept of biodiversity. How is taxonomy helpful in studying biodiversity?

## INFORMATICS PRACTICES (065)

- Q1.** Python Datatype Selection Report-You are instructed to observe & segregate the different types of data(int,float,String)based on their datatype in the following table. Try to collect at least 10 records and fill in the following table in the IP notebook, also suggest which type command you use to capture data in python(int(input()),float(input()),input()).

| Sr.No | Place       | Data Collection medium | Data type | Example | Command                     |
|-------|-------------|------------------------|-----------|---------|-----------------------------|
| 1     | Petrol Pump | Petrol pump meter      | float     | 100.5   | float(input('Enter price')) |

## PHYSICAL EDUCATION (048)

**Write a Practical manual on SAI Khelo India Physical Fitness Test & Yoga with colored picture in your practical manual. (Refer the pdf file which was shared)**

- Cover it with black color paper
- Paste the picture on the left hand side of the manual and label the necessary details.
- Stick pictures on blank pages only
- Detail index should be there
- Decorate it appropriately (inside)