



# DELHI PUBLIC SCHOOL VISAKHAPATNAM

## HALF YEARLY REVISION ASSIGNMENT



**Class: XI Science**

**Date of Submission: on or before 7.09.2026**

### **Subject: ENGLISH**

- I. The Nilgiris Senior Secondary School is holding an inter-school debate on the topic, 'School bullies are a menace; they should be expelled'. You will be participating in the debate from your school. Write your debate, in 120-150 words, choosing a stand for or against the motion.

### **II. GRAMMAR**

- i) By the time we reached the auditorium, the programme \_\_\_\_\_ already \_\_\_\_\_. (*begin*)  
ii) She \_\_\_\_\_ in this school for five years before she moved to another city. (*teach*)  
iii) I will call you as soon as I \_\_\_\_\_ home. (*reach*)  
iv) We stayed indoors because it \_\_\_\_\_ heavily outside. (*rain*)

Rearrange the words to form a meaningful sentence:

- v) governments of the / international language / almost unlikely / to an / world will agree / that the / it is  
vi) unconnected with / creation of the first / artificial language / was / any existing language / the  
vii) invention of a / a natural / based on / the second solution / synthetic language / was the / language

### **III. LITERATURE**

- 1) Every family has a crazy streak in it somewhere, and my cousin Mourad was considered the natural descendant of the crazy streak in our tribe. Before him was our uncle Khosrove, an enormous man with a powerful head of black hair and the largest moustache in the San Joaquin Valley, a man so furious in temper, so irritable, so impatient that he stopped anyone from talking by roaring. It is no harm; pay no attention to it.  
(i) What was the common feature between uncle Khosrove and Mourad?  
(ii) What was uncle Khosrove's pet dialogue?  
a) It is no harm; pay attention to them  
b) It is no harm; pay no attention to it  
c) It is no harm; pay no attention to them  
d) It is no harm; pay attention to it  
(iii) How has the author described the physical features of the uncle?  
(iv) Which word from the given extract means the opposite of 'affable'?  
2) Explain the statement, 'King Tut' is one of the first mummies to be scanned—in death, as in life ..."  
( 40-50 words )  
3) How did the narrator and his family manage to survive the dangerous storm despite the severe damage to their boat? (40- 50 words )  
4) In Ted Hughes' poem The Laburnum Top, the arrival of the goldfinch transforms the scene completely. How is this change depicted in the poem, and what message about change in life does it convey?" ( 120 – 150 words )  
5) Both The Address and A Photograph deal with the themes of loss and memory. Compare how the two narrators cope with the past and its emotional impact on their present lives. ( 120 – 150 words )

### **Subject: MATHEMATICS**

1. Is  $E = \{x : x \in W, x + 3 \leq 3\}$  null set?  
2. For any sets A and B, prove that:  $(A - B) \cup (A \cap B) = A$   
3. Find the range of the function given by  $f(x) = 1 - |x - 2|$ .  
4. Prove that:  $\sin^2 B = \sin^2 A + \sin^2 (A - B) - 2 \sin A \cos B \sin (A - B)$ .  
5. Find the magnitude, in radians and degrees, of the interior angle of a Regular octagon.

6. Evaluate:  $\sqrt{-8i}$ .

7. If  $(x + iy) = \sqrt{\frac{a+ib}{c+id}}$ , prove that  $(x^2 + y^2)^2 = \frac{a^2 + b^2}{c^2 + d^2}$ .

8. Find the solution set of the inequation:  $|2x - 3| > 1$

9. Solve the inequality  $\frac{1}{2}\left(\frac{3x}{5} + 4\right) \geq \frac{1}{3}(x - 6)$  for real  $x$ .

10. In how many ways 9 pictures can be hung from 6 picture nails on a wall?

11. How many 4 - letter code can be formed using the first 10 letters of the English alphabet, if no letter can be repeated?

12. How many terms are free from radical signs in the expansion of  $(a - b)^5$ .

13. If  $(a - b)$ ,  $(b - c)$ ,  $(c - a)$  are in GP then prove that  $(a + b + c)^2 = 3(ab + bc + ca)$ .

14. Find the sum of the GP:  $\frac{2}{9} - \frac{1}{3} + \frac{1}{2} - \frac{3}{4} + \dots$  to 6 terms.

15. Let  $A = \{1, 2, 4, 5\}$   $B = \{2, 3, 5, 6\}$   $C = \{4, 5, 6, 7\}$ .

Verify :  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ .

16. Find the range of each of the following functions:

(i)  $f(x) = 2 - 3x, x \in R, x > 0$

(ii)  $f(x) = x^2 + 2, x$  is a real number

(iii)  $f(x) = x, x$  is a real number

17. Find the domain and range of  $f(x) = |2x - 3| - 3$

18. Let  $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ . Let  $R_1$  be a relation on  $X$  given by

$R_1 = \{(x, y) : x - y \text{ is divisible by } 3\}$  and  $R_2$  be another relation on  $X$  given by

$R_2 = \{(x, y) : \{x, y\} \subset \{1, 4, 7\} \text{ or } \{x, y\} \subset \{2, 5, 8\} \text{ or } \{x, y\} \subset \{3, 6, 9\}\}$ .

Show that  $R_1 = R_2$ .

19. Prove that:  $\operatorname{cosec} \frac{5\pi}{6} = 2$

20. Write the value of  $\sin \frac{\pi}{15} \sin \frac{4\pi}{15} \sin \frac{3\pi}{15}$ .

21. Evaluate:  $x^4 - 4x^3 + 4x^2 + 8x + 44$ , when  $x = 3 + 2i$ .

22. Evaluate:  $x^6 + x^4 + x^2 + 1$ , when  $x = \frac{1+i}{\sqrt{2}}$ .

23. To receive Grade A, in a mathematics course, one must obtain an average of 90 marks or more in five examinations (each of 100 marks). If Ragini's marks in first four examinations are 87, 92, 94 and 95, find minimum marks that Ragini must obtain in fifth examination to get Grade A in the course.

24. If the letters of the word MOTHER are written in all possible orders and these words are written out as in a dictionary, find the rank of the word MOTHER.

25. What is the number of ways of choosing 4 cards from a deck of 52 cards?

In how many of these,

1. 3 are red and 1 is black

2. All 4 cards are from different suits.

3. At least 3 are face cards

4. All 4 cards are of the same colour.

26. If in the expansion of  $(1 + x)^n$ , the coefficients of three consecutive terms are 56, 70 and 56, then find  $n$  and the position of the terms of these coefficients.

27. Using binomial theorem, expand:  $(\sqrt{x} + \sqrt{y})^8$

28. If  $a, b, c, d$  are in GP then prove that  $\frac{1}{(a^2 + b^2)}, \frac{1}{(b^2 + c^2)}, \frac{1}{(c^2 + d^2)}$  are in GP.

29. If  $S$  denotes the sum of an infinite G.P. and  $S_1$  denotes the sum of the squares of its terms, then prove that the first term and common ratio are respectively  $\frac{2SS_1}{S^2 + S_1}$  and  $\frac{S^2 - S_1}{S^2 + S_1}$ .

### Subject: PHYSICS

1. Write the dimensional formula for the following

(a) Work

(b) power

(c) Momenta of inertia

(d) energy

- Round off the following upto 3 significant digits  
(a) 3.029 m                      (b) 0.00175 lit    (c)  $2.18 \times 10^{-3}$  kg                      (d) 7.00025
- State laws of vectors addition.
- Explain (a) Unit vector (b) position vector (c) displacement vector.
- Two forces of magnitude 3 N and 4N acting on a particle. Calculate the resultant force on the particle.
- An aeroplane is moving horizontally with a speed 720 kmph is dropped an object of 10 kg. Calculate the time taken by the object to reach the ground. Calculate the horizontal distance travelled by the object.
- State Newton's three laws and derive an expression for  $F = ma$ . And also verify Newton's first law by using Newton's second law.
- What is the angle of banking. Derive an expression for angle of banking on banked curved road of radius  $r$ .
- Define scientific work . Explain nature of work with examples. Derive an expression for work done by variable force.
- What is scalar product of two vectors. Explain its properties. Find the angle between two vectors  $A = 2\mathbf{i} + 3\mathbf{j} - \sqrt{5}\mathbf{k}$ .  $B = 2\mathbf{i} - 2\mathbf{j} - \sqrt{3}\mathbf{k}$ .

## **Subject: CHEMISTRY**

### **Ch-4 Chemical Bonding**

- $\text{CO}_2$  and  $\text{SO}_2$  both are triatomic molecules yet there is a big difference in their dipole moment. Why?
- Explain the structure of carbonate ion and  $\text{O}_3$  in terms of resonance.
- Give shapes of  $\text{ClF}_3$ ,  $\text{XeF}_4$ ,  $\text{AsF}_5$ ,  $\text{H}_2\text{O}$  and  $\text{NH}_3$  using VSEPR theory.
- $\text{AlF}_3$  is a high melting solid whereas  $\text{SiF}_4$  is a gas. Explain.
- Define hybridization. Explain the structures of  $\text{C}_2\text{H}_6$ ,  $\text{C}_2\text{H}_4$  and  $\text{C}_2\text{H}_2$  with orbital diagrams.
- What is the hybridization and shapes of  $\text{PCl}_5$  and  $\text{SF}_6$ ? Explain with diagrams.
- Compare the relative stability of the species  $\text{O}_2^+$ ,  $\text{O}_2^-$  and  $\text{O}_2^{2-}$  on the basis of molecular orbital theory and indicate their magnetic properties.
- What is meant by hydrogen bond? Why  $\text{HF}$  and  $\text{H}_2\text{O}$  are liquids while  $\text{HCl}$ ,  $\text{H}_2\text{S}$  are gases?
- Covalent bonds are directional while ionic bonds are non-directional. Why?
- Write Lewis structure of the following compounds and show formal charge on each atom:  $\text{HNO}_3$ ,  $\text{NO}_2$ ,  $\text{H}_2\text{SO}_4$ .
- In both water and dimethylether, oxygen is central atom and has the same hybridization yet they have different bond angles. Why?
- Define Hydrogen bonding. Explain with examples the two types of Hydrogen bonds.

### **Ch-5 Thermodynamics**

- Differentiate:
  - Extensive and intensive properties
  - Isothermal and isobaric process
- Calculate enthalpy of solution of  $\text{NaCl}$  if its lattice enthalpy is 788 KJ/mol. Is the process exo or endothermic?
- If 221.4J is needed to heat 30g of ethanol from 15 to  $18^\circ$ , calculate a) specific heat capacity b) molar heat capacity of ethanol. [Ans 2.46, 113 J/K/mol]
- The combustion of benzene(l) gives  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . Given that heat of combustion at constant volume is -3263.9 kJ/mol at  $25^\circ\text{C}$ , calculate heat of combustion in kJ/mol at constant pressure.  $R=8.314$ . [Ans -3267.62]
- Calculate the maximum work obtained when 0.75 mol of an ideal gas expands isothermally and reversibly at  $27^\circ\text{C}$  from a volume of 15L to 25L. [Ans -955.9 J]
- Why is the entropy of a substance taken as zero at 0K? Calculate the standard Gibbs free energy change for the reaction  $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$  at 298K. The value of equilibrium constant for the above reaction is  $6.6 \times 10^5$ .  $\log 6.6 = 0.8195$  [Ans -33.205 kJ/mol]
- For the gas phase reaction  $\text{H}_2 + \text{Cl}_2 \rightleftharpoons 2\text{HCl}$   $\Delta H = -92\text{kJ}$  and  $\Delta S = -95\text{J/K}$ . Calculate the equilibrium constant  $K_p$  at 298K for this reaction. (Antilog  $11.2166 = 1.646 \times 10^{11}$ )
- An ideal gas is allowed to expand against constant pressure of 2 bar from 10 to 50L in one step. Calculate the amount of work done by the gas. If the same expansion were carried out reversibly will the work done be higher or lower than the earlier case? 1Lbar=100J. [ans more]

### **Assertion Reason Questions: (chapters 1 to 5)**

Note: In these questions a statement of assertion and reason is given. Choose the correct option.

- Assertion and Reason both are correct statements and reason is correct explanation for assertion.
- Assertion and Reason both are correct statements but reason is not correct explanation for assertion.
- Assertion is correct statement but Reason is wrong statement.

(d) Assertion is wrong statement but Reason is correct statement

Now answer the following:

1. Assertion: Heat of neutralisation of HCl and NaOH is the same as that of H<sub>2</sub>SO<sub>4</sub> and NaOH.  
Reason: All three are strong electrolytes.
2. Assertion: Chlorine when solidifies does not have zero entropy even at absolute temperature.  
Reason: Chlorine is a pungent smelling gas and it is difficult to solidify it.
3. Assertion: Covalent bonds are called directional bonds.  
Reason: A covalent bond is formed by the overlap of half filled atomic orbitals which have definite directions.
4. Assertion: Among the two O-H bonds of water molecule, energy required to break both the O-H bonds is the same.  
Reason: The electronic environment around O atom changes after one bond is broken.
5. Assertion: Beryllium has a smaller first ionisation enthalpy than boron.  
Reason: The penetration of a 2s electron towards nucleus is more than a 2p electron, hence 2p electron is more shielded by the inner core of electrons than the 2s electron.
6. Assertion: Helium and beryllium both are chemically inert.  
Reason: They have similar outer electronic configuration of the type ns<sup>2</sup>.
7. Assertion: All types of electromagnetic radiations travel with the same velocity.  
Reason: Electromagnetic radiations have dual nature.
8. Assertion: Hydrogen has only one electron in its orbit but it produces several spectral lines.  
Reason: There are many excited energy levels available.
9. Assertion: Number of moles of H<sub>2</sub> in 0.224L of hydrogen is 0.01mol.  
Reason: 22.4L of H<sub>2</sub> at STP contains 6.022x10<sup>23</sup> mols.
10. Assertion: Combustion of 16g of methane gives 18g of water.  
Reason: In the combustion of methane, water is one of the products.

### Subject: BIOLOGY

1. In a cymose inflorescence, the main axis
  - a) has unlimited growth
  - b) has limited growth
  - c) terminates in a flower
  - d) both b and c
2. Name two plants whose ovary shows free-central placentation.
  - i) Where is pericycle located?
  - ii) How are xylem vessels arranged?
  - iii) What do you call such an arrangement?
  - iv) Which type of cells constitute the cortex?
3. Where does the ventricle pump blood into, in a frog's heart?
4. Draw a diagram of the reproductive system of a female frog and label six parts in it.
5. Match column I with column II and select the correct option.

| Column I        | Column II                                       |
|-----------------|-------------------------------------------------|
| a. Leucoplasts  | 1. Formation of basal bodies for cilia          |
| b. Cytoskeleton | 2. Storage of reserve food materials            |
| c. Centriole    | 3. Synthesis of steroid hormone in animal cells |
| d. SER          | 4. Protection from the immediate environment    |
|                 | 5. Maintenance of cell shape.                   |

6. What is the significance of Golgi bodies in a cell?
7. Draw a labelled diagram of Cillium/Flagellum.
8. Enumerate the key features of metaphase.
9. At what stage of mitosis do the chromosomes migrate to the opposite poles?
10. List the significance of meiosis.

### Subject: ARTIFICIAL INTELLIGENCE

1. What is the difference between = and == operator in Python? Give one example each.
2. Find the error in the following code and rewrite the correct code:  
x = 10            y = "20"            print(x + y)

3. What will be the output of the following code?

```
a = 15
```

```
b = 4
```

```
print(a // b)
```

```
print(a % b)
```

```
print(a ** 2)
```

4. Name any 4 basic data types in Python and give one example for each.

5. Write a Python program to take marks of 3 subjects as input and calculate total and average. Print both.

6. Write a program to check whether a given number is even or odd using if-else.

7. What is the difference between input() and print() function in Python? Give one example each.

8. What is type conversion? Explain int() and str() with one example each.

9. Write a program to check whether a person is eligible to vote or not. (Age >= 18 is eligible)

10. Write a Python program to take two numbers from user and swap their values without using third variable.

11. What are variables in Python? Write rules for naming variables with examples.

12. Explain three types of operators in Python - Arithmetic, Relational and Logical with examples.

### **Subject: PHYSICAL EDUCATION**

1. What is meant by pranayam?

Explain different types of pranayams in detail.

2. What is meant by yoga? Discuss the elements of yoga.

3. What are the leadership qualities and role of a leader.