

SHREE VASISHTHA VIDHYALAYA

(CBSE affiliated, Member-NPSC, Recipient-International School Award, Eco Schools Award, Duke of Edinburgh & RIDS)

Assignment for Term - I: 2026 27

Class-XI Science

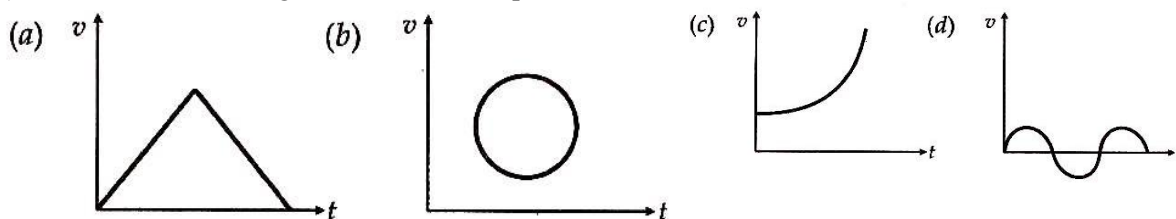
DATE OF SUBMISSION: 01-09-2026 (Tuesday)

1.	ENGLISH
	Level 1 Easy 1. The Portrait of a Lady How did the grandmother look when the author was a child? Why did the grandmother always carry a rosary? 2. The Address Why did Mrs. S ask the narrator to forget the address? What did the narrator find at Mrs. Dorling's house? 3. Discovering Tut: The Saga Continues Who was Tutankhamun? Why was King Tut's mummy examined using modern technology? 4. The Voice of the Rain Who is the speaker in the poem? What does the rain do when it falls on the earth? 5. A Photograph What does the photograph show? Why does the poet feel sad while looking at the photograph? 6. We're Not Afraid to Die... if We Can All Be Together Who were the members of the family on the boat? What happened to the boat during the storm? 7. The Summer of the Beautiful White Horse Who were Aram and Mourad? Why was Aram surprised to see Mourad with a beautiful white horse? 8. Mother's Day Why was Mrs Pearson unhappy with her family? What did Mrs Fitzgerald advise Mrs Pearson to do?
	Level 2 1. The Portrait of a Lady How did the relationship between the author and his grandmother change after he moved to the city? Explain. Why did the grandmother dislike the author's music lessons at school? 2. The Address How did the narrator's visit to Mrs Dorling's house make her realise that the belongings of her mother had lost their emotional value? Why did the narrator decide not to visit Mrs Dorling again? 3. Discovering Tut: The Saga Continues What difficulties did the scientists face while examining King Tut's mummy? Why has King Tut's death remained a mystery despite the use of modern scientific methods? 4. The Voice of the Rain Explain how the rain describes its journey from the earth to the sky and back to the earth. Why does the rain compare itself to a song? 5. A Photograph How does the photograph bring out the contrast between the poet's mother's childhood and her present absence? Explain the significance of the line "Its silence silences." 6. We're Not Afraid to Die... if We Can All Be Together How did the family members show courage and determination during the dangerous storm? How did the children's attitude give strength to the narrator and his wife? 7. The Summer of the Beautiful White Horse Why did Aram find it difficult to believe that Mourad had stolen the horse? How did the Garoghlanian family's reputation influence Aram's understanding of Mourad's actions?

	8. Mother's Day How did Mrs Fitzgerald help Mrs Pearson change her behaviour towards her family? What does the play suggest about the way family members should treat a mother?
	Level 3 1. The Portrait of a Lady The grandmother's changing relationship with the author reflects the impact of modern education and changing lifestyles. Critically examine how Khushwant Singh presents the conflict between tradition and modernity through their relationship. The grandmother appears to accept the changes in her life silently, yet her actions reveal deep emotions. Discuss how her silence, prayers, and final moments communicate her character more powerfully than words. 2. The Address The story suggests that material possessions can preserve memories but cannot replace the people associated with them. Discuss this idea with reference to the narrator's experience at Mrs Dorling's house. Mrs Dorling can be viewed both as a selfish opportunist and as a survivor of difficult circumstances. Examine her character critically and discuss whether the story gives enough evidence to judge her completely. 3. Discovering Tut: The Saga Continues Despite the availability of advanced technology, the exact cause of King Tut's death remains uncertain. What does this uncertainty reveal about the limitations of scientific investigation when dealing with historical mysteries? The chapter combines archaeology, history, science, and human curiosity. Analyse how the examination of Tut's mummy reflects humanity's desire to uncover the secrets of the past. 4. The Voice of the Rain The rain describes itself as a "poem of the earth." Analyse this metaphor and explain how it connects the natural cycle of rain with the creative process of poetry. The poem presents rain as a force that gives back to the earth what it receives from it. How does this idea create a deeper philosophical message about nature, life, and renewal? 5. A Photograph The photograph freezes a moment in time, but the poet's memories reveal that time continues to change everything. Analyse how the poem presents the paradox of permanence and change. The poem moves from the poet's mother's childhood to her death and finally to the poet's present silence. How does this progression transform an ordinary photograph into a meditation on loss, mortality, and the passage of time? 6. We're Not Afraid to Die... if We Can All Be Together The family's survival depends not only on physical strength but also on emotional courage and unity. Analyse how the behaviour of the children and adults contributes to the family's survival during the crisis. The title suggests that togetherness is more important than the fear of death. How does the narrative prove this idea through the experiences of the family and the crew? 7. The Summer of the Beautiful White Horse Aram knows that the horse has probably been stolen, yet he chooses to believe that Mourad could not be a thief. Analyse this conflict between moral knowledge, family loyalty, and childhood innocence. The Garoghlanian family is famous for its honesty despite being poor. How does William Saroyan use this family reputation to create irony and develop the central moral conflict of the story? 8. Mother's Day Mrs Pearson's transformation from a submissive mother to a confident woman changes the behaviour of her entire family. Discuss how the play uses humour and exaggeration to expose the problem of taking mothers for granted. Mrs Fitzgerald plays a crucial role in changing Mrs Pearson's life, but she does so through an unusual method. Do you think her approach is justified? Critically evaluate her role in bringing about Mrs Pearson's transformation.
2.	PHYSICS
	<u>MCQ</u> 1) The area of a square is 5.29 cm^2. The area of 7 such squares taking into account the significant figures, is (a) 37.03 cm^2 (b) 37.0 cm^2 (c) 37.030 cm^2 (d) 37 cm^2 2) The velocity v of a particle at time t is given by $v = at + \frac{b}{c+x}$, where a, b and c are constants. The dimensions of a, b and c are

- (a) $[L], [LT], [LT^{-2}]$ (b) $[L^2], [T], [LT^{-2}]$ (c) $[LT^{-2}], [L], [T]$ (d) $[LT^{-2}], [LT], [L]$

3) Which of the following curves does not represent motion in one dimension ?



4) A car moves along a straight line, whose equation of motion is given by

$$S = 12t + 3t^2 - 2t^3$$

Where s is in metre and t in seconds. The velocity of the car at the start will be

- (a) 7 m/s (b) 9 m/s (c) 12 m/s (d) 16 m/s

5) No force is required for

- (a) An object moving in a straight line with constant velocity
(b) An object moving in a circular motion
(c) An object moving with constant acceleration
(d) An object moving in elliptical path

6) One end of a string of length l is connected to a particle of mass m and the other to a small peg on a smooth horizontal table. If the particle moves in a circle with speed v the net force on the particle (directed towards the centre) is

- (a) T (b) $T - \frac{mv^2}{l}$ (c) $T + \frac{mv^2}{l}$ (d) Zero

7) Pick out the only vector quantity in the following list:

Temperature, pressure, impulse, time, power, total path length, energy, gravitational potential, coefficient of friction and charge

- (a) Pressure (b) Impulse
(c) Coefficient of friction (d) Charge

8) Change in potential energy of the system is equal to

- (a) Negative of the work done by external forces.
(b) Negative of the work done by internal conservative forces.
(c) Negative of the work done by all forces
(d) None of these

9) Two objects of equal masses placed at a certain distance from each other, attract each other with a force F . If one-third of mass of one object is transferred to the other object, then the new force will be

- (a) $\frac{2}{9}F$ (b) $\frac{16}{9}F$ (c) $\frac{8}{9}F$ (d) F

10) The moment of the force, $F = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at $(2, 0, -3)$, about the point $(2, -2, -2)$, is given by

- (a) $-7\hat{i} - 8\hat{j} - 4\hat{k}$ (b) $-4\hat{i} - \hat{j} - 8\hat{k}$ (c) $-8\hat{i} - 4\hat{j} - 7\hat{k}$ (d) $-7\hat{i} - 4\hat{j} - 8\hat{k}$

For Questions 13 to 16, two statements are given –one labelled Assertion (A) and other labelled Reason (R). Select the correct answer to these questions from the options as given below.

- (a) If both Assertion and Reason are true and Reason is correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

11) **Assertion:** Impulsive force is large and acts for a short time.

Reason: Finite change in momentum should be produced by the force.

12) **Assertion:** Work done by gravitational force in lifting a bucket out of a well by means of a rope tied to the bucket is negative.

Reason: Bucket moves in the direction opposite to gravitational force.

2 marks

13) The driver of a three wheeler moving with a speed of 36 kmh^{-1} sees a child standing in the middle of the road and brings his vehicle to rest in 4 s just in time to save the child. What is the average retarding force on the vehicle? The mass of the three-wheeler is 400 kg and the mass of the driver is 65 kg.

- 14) Define angle of friction. Deduce its relation with coefficient of friction with the help of suitable figure.
- 15) On a certain day, rain was falling vertically with a speed of 35 m/s. A wind started blowing after some time with speed of 12 m/s in east to west direction. In which direction should a boy waiting at a bus stop hold his umbrella? Also find the resultant velocity.
- 16) State laws of limiting friction and Rolling friction

3 marks

- 17) Define fundamental physical quantities.

Obtain an expression for the centripetal force F acting on a particle of mass m moving with velocity v in a circle of radius r . Take dimensionless constant $k=1$.

- 18) A man weighs 70 kg. he stands on a weighing machine in a lift, which is moving

- i) Upwards with a uniform speed of 10 m/s
- ii) Downwards with a uniform acceleration of 5 m/s²
- iii) Upwards with a uniform acceleration of 5 m/s²

What would be the readings on the scale in each case?

- 19)

- a) Distinguish between average velocity and instantaneous velocity.
- b) The displacement (in metre) of a particle moving along x-axis is given by $x = 18t + 5t^2$. Calculate the instantaneous velocity at $t = 2$ s, and average velocity between $t = 2$ s and $t = 3$ s.

20) Write SI unit of angular acceleration.

- i) The position of a particle is given by $\vec{r} = 3.0t\hat{i} - 2.0t^2\hat{j} + 4.0\hat{k}$ m

Where t is in seconds (a) find the $\vec{v}(t)$ and $\vec{a}(t)$ of the particle (b) What is the magnitude and direction of velocity of the particle at $t = 2$ s?

- 21) A body of mass 2 kg initially at rest moves under the action of an applied horizontal force of 7 N on a table with coefficient of kinetic friction = 0.1, compute the

- i) Work done by the applied force in 10 s,
- ii) Work done by the friction in 10 s,
- iii) Work done by the net force on the body in 10 s, and
- iv) Change in kinetic energy of the body in 10 s.

- 22) A pump on the ground floor of a building can pump up water to fill a tank of volume 30 m³ in 15 min. If the tank is 60 m above the ground, and the efficiency of the pump is 30 %, how much electric power is consumed by the pump?

Case Study Based Questions

Read the following paragraph and answer the questions

23) When an object is released from rest or projected vertically upwards or downwards, then the motion of the object remains restricted to the vertical straight line, but when it is thrown in some other direction, then it follows a curved path and it is known as **projectile motion**.

- 1) Two projectiles are fired from the same point with the same speed at angles of projection 60° and 30° respectively. Which one of the following is true?
 - i) Their maximum height will be same.
 - ii) Their range will be same
 - iii) Their landing velocity will be same
 - iv) Their time of flight will be same.
- 2) A particle is projected at an angle of 45°. The relation between range and maximum height attained by the particle is

i) $R = 4H$	ii) $4R = H$	iii) $2H = R$	iv) $H = R$
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- 3) The expression for time of flight of a projectile is

i) $\frac{u \sin \theta}{g}$	ii) $\frac{u \sin \theta}{2g}$	iii) $\frac{u \tan \theta}{g}$	iv) $\frac{2u \sin \theta}{g}$
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- 4) A ball is thrown from the ground with a velocity of $20\sqrt{3}$ m/s making an angle of 60° with the horizontal. The ball will be at a height of 40 m from the ground after a time t ($g = 10$ m/s²) equal to

i) $\sqrt{2}s$	ii) $\sqrt{3}s$	iii) $2s$	iv) $3s$
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Read the following paragraph and answer the questions

24) When the spring is compressed or stretched by pulling or pushing the block attached to it, a spring force F_s begins to act in the spring towards the equilibrium position; which is directly proportional to the displacement of the block.

- 1) In the equation : $W = \frac{1}{2}kx^2$, the dimension of k is
 - i) $[M^1 L^0 T^{-2}]$
 - ii) $[M^0 L^1 T^{-1}]$
 - iii) $[M^1 L^1 T^{-2}]$
 - iv) $[M^1 L^0 T^{-1}]$
- 2) A spring force constant 800 N/m has an extension of 5 cm. The work done in extending it from 5 cm to 15 cm is
 - i) 16 J
 - ii) 8 J
 - iii) 32 J
 - iv) 24 J
- 3) Which one of the following is not a conservative force?
 - i) Gravitational force
 - ii) Spring force
 - iii) Frictional force
 - iv) Electrostatic force
- 4) In a car accident simulation, a car of mass 1000 kg moving with a speed of 18 km/h on a smooth road and colliding with a horizontally mounted spring of spring constant 6.25×10^3 N/m. What is the maximum compression of the spring?
 - i) 2.0 cm
 - ii) 4.0 cm
 - iii) 2.5 cm
 - iv) 5 cm

5 marks

- (a) 25) State and prove work – energy theorem.
- (b) A block of mass $m = 1$ kg, moving on a horizontal surface with speed $v_i = 2$ m/s enters a rough patch ranging from $x = 0.10$ m to $x = 2.01$ m. The retarding force F , on the block in this range is inversely proportional to x over this range.

$$F_r = \frac{-k}{x} \quad 0.1 < x < 2.01 \text{ m}$$

$$= 0 \quad \text{for } x < 0.1 \text{ m and } x > 2.01 \text{ m}$$

Where $k = 0.5$ J. What is the final kinetic energy and speed v_f of the block as it crosses this patch?

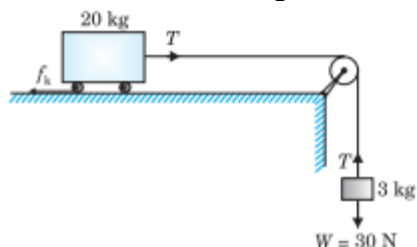
- (i) 26) Prove that in a one dimensional elastic collision between two bodies, the relative velocity of approach is equal to velocity of separation after collision.

The bob of a pendulum is released from a horizontal position A as shown. If the length of the pendulum is 1.5 m, what is the speed with which the bob arrives at the lowermost point B, given that it dissipates 5% of its initial energy against air resistance ?

27) Define banking of road. Obtain expression for maximum safety speed of a vehicle on curved banked road.

A force of 49 N is just sufficient to pull a block of wood weighing 10 kg on a rough horizontal surface. Calculate the coefficient of friction and angle of friction.

28) What is the acceleration of the block and the trolley system shown in figure, if the coefficient of kinetic friction between the trolley and the surface is 0.04? What is the tension in the string? Take $g = 10$ m/s². Neglect the mass of the string.



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and derive it using Newton's laws of motion.

3.

CHEMISTRY

- Q1. What is the SI unit of molarity?
- Q2. State the Law of Conservation of Mass in one sentence.
- Q3. Write the complete electronic configuration of the Cu^+ ion (Atomic number of Cu = 29).
- Q4. Which quantum number determines the spatial orientation of an atomic orbital?
- Q5. Define the term "Ionic Radius".
- Q6. Which element in the modern periodic table possesses the highest electronegativity value?
- Q7. Draw the basic Lewis dot structure for a standard water (H_2O) molecule showcasing its valence electrons
- Q8. State the molecular geometry of an ammonia (NH_3) molecule according to VSEPR theory.

- Q9. What is the standard oxidation number assigned to oxygen in peroxides like H_2O_2 ?
 Q10. a) Define Hybridization. State its primary purpose in chemical bonding. (1 Mark)
 (b) Define Dipole Moment. Write down its mathematical formula and standard unit. (1 Mark)
 (c) What is the definition of Hydrogen Bonding?

Section B: (2 Marks Each)

- Q11. Define the term "Limiting Reagent" with a suitable chemical example.
 Q12. State the Law of Definite Proportions. Why is it also known as the Law of Constant Composition?
 Q13. Calculate the molecular mass of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and determine its empirical formula.
 Q14. State Heisenberg's Uncertainty Principle mathematically and define each variable involved.
 Q15. What is the fundamental difference between an 'orbit' (Bohr's concept) and an 'orbital' (Quantum mechanical concept)?
 Q16. Using the $(n+1)$ rule, arrange the following orbitals in increasing order of energy: 4s, 3d, 4p, 5s.
 Q17. Explain why the ionization enthalpy of noble gases is exceptionally high.
 Q18. Define "Screening Effect" (Shielding Effect) and describe its general variation down a group.
 Q19. Explain why BeH_2 has a linear shape whereas H_2O has a bent shape, even though both are triatomic molecules.
 Q20. Define "Bond Order" according to Molecular Orbital Theory. What does a bond order of zero indicate about a species?
 Q21. Draw the shifting Lewis resonance structures of the Nitrate ion (NO_3^-).
 Q22. (a) Define Atomic Orbital. How does it structurally differ from an orbit? (1 Mark)
 (b) State Heisenberg's Uncertainty Principle mathematically, defining all variables. (1 Mark)
 (c) What is meant by the Work Function of a metal during the photoelectric effect?
 Q23. What are fractional oxidation states? Give one example of a compound showing it.
 Q24. (a) Define Ionization Enthalpy. Mention its standard SI unit. (1 Mark)
 (b) Define Electron Gain Enthalpy. Why can its value be positive for some elements? (1 Mark)
 (c) Provide the definition of Screening Effect. (1 Mark)
 Q25. Why can HNO_2 act as both an oxidizing and a reducing agent, while HNO_3 acts only as an oxidizing agent?

Section C: Short Answer Type-II (3 Marks Each)

- Q26. A solution of ethanol in water is prepared by dissolving 46 g of ethanol in 90 g of water. Calculate the mole fraction of both components. (Molar mass: Ethanol = 46 g/mol, Water = 18 g/mol)
 Q27. Clearly differentiate between the concepts of Electron Gain Enthalpy and Electronegativity.
 Your response must highlight:
 (a) The fundamental difference in their standard definition. (1 Mark)
 (b) The state of the atom when the property is being measured. (1 Mark)
 (c) Whether these properties are isolated absolute thermodynamic values or relative structural attributes.
 Q28. Differentiate between Molarity (M) and Molality (m). Out of these two, which one changes value when temperature fluctuates, and why?
 Q29. State and illustrate Hund's Rule of Maximum Multiplicity and Pauli's Exclusion Principle using the filling pattern of a Nitrogen atom ($Z=7$).
 Q30. Find the wave number and energy of a photon emitted during an electronic transition from $n=4$ to $n=2$ orbit in a hydrogen atom. (Rydberg constant, $R_H = 109,677 \text{ cm}^{-1}$)
 Q31. The first ionization enthalpy values (kJ mol^{-1}) of Al and Mg are 577 and 737 respectively. Explain why Magnesium requires more energy to lose its first electron than Aluminium, despite Aluminium having a higher nuclear charge.
 Q32. Discuss the horizontal trend of atomic radii across Period 3 (from Na to Ar). Why do noble gases show an abrupt increase in atomic radius value compared to halogens?
 Q33. State the main postulates of Valence Shell Electron Pair Repulsion (VSEPR) theory. Order the magnitude of repulsions between lone pairs (lp) and bonding pairs (bp).
 Q34. Calculate the formal charge on each individual oxygen atom in the Ozone (O_3) molecule.
 Q35. Balance the following skeletal ionic equation in an acidic medium using the half-reaction method
 $\{\text{MnO}_4^-(\text{aq}) + \text{SO}_3^{2-}(\text{aq}) \rightarrow \text{Mn}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq})\}$

Section D: Long Answer Type (5 Marks Each)

- Q36. (From Chapter 1) An organic compound containing carbon, hydrogen, and oxygen gave the following analytical data: C = 40.0%, H = 6.67%, and the rest is oxygen. The vapour density of the compound is 30.

(a) Determine the empirical formula of the compound. (3 Marks) (b) Find its molecular mass and calculate its final molecular formula. (2 Marks)

Q37. (From Chapter 2) Answer the following questions based on quantum mechanics and atomic structure:

(a) Write down the values of all four quantum numbers (n, l, m_l, m_s) for the outermost valence electron of a Potassium atom ($Z=19$). (2 Marks)

(b) What is the de Broglie wavelength of a bullet of mass 0.040 kg travelling at a speed of 1.0 km/s? ($h = 6.626 \times 10^{-34}$ J s). (2 Marks)

(c) Why are 3f and 2d orbitals not structurally permissible in an atom? (1 Mark)

Q38. (From Chapter 3) Define the following periodic properties and explain their general trends both along a period (left to right) and down a group (top to bottom):

(a) Metallic Character (1.5 Marks)

(b) Ionic Radii (with respect to cations and anions) (1.5 Marks)

(c) Valence or standard Oxidation states across a period (2 Marks)

Q39. Apply the Molecular Orbital Theory (MOT) to answer the following:

(a) Write the molecular orbital electronic configuration for O_2 , $\{O_2\}_-$. (2 Marks)

(b) Calculate the precise bond order for each of these two species. (1.5 Marks)

(c) Arrange them in increasing order of bond stability and state their magnetic nature (paramagnetic or diamagnetic). (1.5 Marks)

Q40. What is a disproportionation reaction? Show how elemental phosphorus (P_4) undergoes a disproportionation reaction when treated with an alkaline $\{OH^-\}$ medium by writing a fully balanced chemical equation

Section E: Paragraph / Case-Based Questions Paragraph

1: Chemical Bonding & Molecular Shapes (Questions 41-45)

In covalent molecules, the simple overlap of atomic orbitals cannot always explain observed shapes and bond angles. To reconcile these properties, Linus Pauling introduced the concept of hybridization, where atomic orbitals of slightly different energies intermix to form a new set of equivalent orbitals known as hybrid orbitals. However, when lone pairs are present on the central atom, the ideal geometry is distorted due to asymmetrical repulsions. According to VSEPR theory, lone pairs occupy more space than bond pairs because they are attracted to only one nucleus instead of two. Molecules like Ammonia (NH_3) and Water (H_2O) exhibit altered bond angles from the standard tetrahedral angle of 109.5° due to these forces

.Q41. Why do lone pairs demand a larger spatial volume around the central atom compared to regular bonding pairs?

Q42. Predict the type of hybridization and the actual spatial shape of an NH_3 molecule.

Q43. Compare the bond angles of CH_4 , NH_3 , and H_2O . Explain the reason behind this decreasing trend.

Q44. What is the type of hybridization found in the central atom of PCl_5 ? Name its ideal spatial geometry.

Q45. Can a molecule have polar covalent bonds but still possess a net dipole moment equal to zero? Illustrate your answer using BF_3 or CO_2 .

Paragraph 2: Quantization & Bohr's Atomic Model

(Questions 46-50)

Niels Bohr tackled the classical limitation of Rutherford's nuclear model by introducing the quantization of angular momentum. He postulated that electrons revolve around the nucleus only in certain selected non-radiating circular paths called stationary orbits. Energy is emitted or absorbed only when an electron transitions or jumps from one stationary orbit to another. While Bohr's model successfully explained the line spectrum of the hydrogen atom and permitted the calculation of electronic radii and energies, it failed to interpret the spectra of multi-electron atoms and could not account for the splitting of lines under magnetic (Zeeman effect) and electric fields (Stark effect).

Q46. State Bohr's mathematical quantization condition for an electron moving in a stationary circular orbit

Q47. What happens to the energy of an electron when it drops from an outer orbit to an inner orbit closer to the nucleus?

Q48. Write down the complete mathematical expression used to calculate the radius of Bohr's n th orbit.

Q49. State two major limitations of Bohr's atomic model that led to the development of the modern quantum mechanical model

Q50. Will Bohr's mathematical formula for calculating electronic energy work for a Helium ion (He^+)? Justify your answer

4.	MATHEMATICS
	- Let $A = \{x \in \mathbb{R} : x^2 - 5x + 6 = 0\}$, $B = \{x \in \mathbb{R} : x^2 - 7x + 12 = 0\}$, and $C = \{x \in \mathbb{R} : x^2 - 9x + 20 = 0\}$. Find $A \cup B \cup C$, $A \cap (B \cup C)$, and $(A \cup B) \cap (A \cup C)$. Verify the distributive law. - In a universal set U, let $A, B, C \subseteq U$. Prove using set identities that $[A - (B \cup C)] \cup [B - (C \cup A)] \cup [C - (A \cup B)]$ represents the set of elements belonging to exactly one of A, B, C. - Let $A = \{x : x \in \mathbb{Z} \mid x - 2 \leq 3\}$ and $B = \{x : x \in \mathbb{Z} \mid x^2 - 5x + 6 < 0\}$. Find $A, B, A \cup B, A \cap B$, and $A - B$. - If A and B are finite sets such that $n(A \cup B) = 40$, $n(A - B) = 15$, $n(B - A) = 10$, find $n(A)$, $n(B)$, and $n(A \cap B)$. If $C \subseteq A \cap B$ and $n(C) = 5$, determine the number of subsets of $A \cup B$ containing C. - Prove that if $A \subseteq B$, then $A \cap B = A$, $A \cup B = B$, $A - B = \emptyset$. Conversely, prove that $A \cap B = A$ implies $A \subseteq B$. - For any three sets A, B, C, Prove that : $(A \cap B) \cup (A \cap C) = A \cap (B \cup C)$, and hence simplify $[A \cap (B \cup C)] \cup [A \cap (B' \cup C')]$. - Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 4, 6, 8, 10\}$. Define a relation R from A to B by $R = \{(x, y) : y = 2x \text{ or } y = x + 2\}$. Write R, its domain and range, and determine whether R is a function. Give reasons. - Determine the domain and range of $f(x) = \frac{\sqrt{4-x^2}}{\sqrt{x^2-1}}$. - Find the domain and range of $f(x) = \sqrt{\frac{x-1}{x+2}}$. - Determine the domain and range of $f(x) = \frac{1}{\sqrt{9-x^2}}$. - Prove that $\frac{\sin A + \sin B}{\cos A + \cos B} = \tan \frac{A+B}{2}$, whenever the expression is defined. Hence evaluate $\frac{\sin 75^\circ + \sin 15^\circ}{\cos 75^\circ + \cos 15^\circ}$. - Solve for $x \in [0, 2\pi]$: $2\sin^2 x - 3 \sin x \cos x - \cos^2 x = 0$. - Prove the identity : $\frac{\cos x + \cos 3x}{\sin x + \sin 3x} = \cot 2x$, - If $\tan \theta + \cot \theta = 4$, find the exact values of: $\tan^2 \theta + \cot^2 \theta$ and $\sin^4 \theta + \cos^4 \theta$. - If $\sin x + \cos x = \sqrt{2} \cos x$, find all possible values of x in $[0, 2\pi]$. - Prove that : $\sin^6 x + \cos^6 x = 1 - 3\sin^2 x \cos^2 x$. Hence find its value when $\sin x \cos x = \frac{1}{4}$. - If $z = \frac{3+4i}{2-i}$, express z in the form $a + ib$, and hence find z and $\bar{z}$. - Solve the quadratic equation $x^2 - (3 + 2i)x + (5 + i) = 0$ over the complex numbers. - Find the values of x for which $(x + i)^2 + (x - i)^2 = 2x^2 - 6$. - If the roots of $x^2 - 2(a + 1)x + (a^2 + 3) = 0$ are real and distinct, determine the range of a. Further, find the values of a for which the roots are positive. - Simplify : $\frac{(2+3i)(4-5i)}{1-2i}$. Express the answer in the form $a + ib$. - If $z + \bar{z} = 6$, $z\bar{z} = 13$, find z and $\bar{z}$. - Find the quadratic equation whose roots are $2 + i$ and $2 - i$. Then find the equation whose roots are the squares of these roots. - Solve the system of inequalities: $3x - 2 < 4x + 5$, $5x + 1 \geq 2x - 8$, $7 - 2x > 1$. Represent the solution graphically on the real number line. - Solve: $3(2x - 1) - 4(x + 2) \leq 5x - 7$. Represent the solution on the number line. - Solve the compound inequality: $-3 < \frac{2x-1}{3} \leq 5$. - A 10% salt solution is to be diluted by adding a 2% salt solution. The resulting mixture is to contain more than 4% but less than 7% salt. If 500 litres of the 10% solution are available, find the range of the quantity of 2% solution that can be added. - A 15% alcohol solution is diluted by adding water to it. The resulting mixture should contain more than 5% but less than 10% alcohol. If 400 litres of the 15% solution are available, determine the range of the quantity of water to be added. - A shopkeeper buys an article for ₹800 and wants to sell it at a profit of more than 15% but less than 25%. Between what two prices should he sell the article? - A shirt is marked at ₹2,000. After giving a discount of ₹x, the selling price should be more than ₹1,500 but less than ₹1,700. Find the range of the discount x.

	31. The present age of a father is 4 times the age of his son. After 5 years, the father's age will be less than 3 times the son's age. If the son's present age is x, find the possible values of x. 32. Find all positive integers x such that the sum of x and the next three consecutive integers is greater than 50 but less than 70. 33. Find all integers x such that three times the number exceeds 10 by more than 5 but is less than 40. 34. The length of a rectangle is 5 cm more than its breadth. If its perimeter is greater than 50 cm but less than 70 cm, find the possible range of its breadth. 35. The temperature of a laboratory must be maintained above 18°C but below 25°C. If the temperature is initially 30°C and decreases by 1.5°C every hour, for how many hours can the laboratory operate within the required temperature range? 36. A taxi charges ₹100 as a fixed charge and ₹15 per kilometre. A passenger has more than ₹400 but less than ₹700 available. Find the range of distances the passenger can travel. 37. How many distinct arrangements can be made using all the letters of the word MISSISSIPPI such that no two S's are together? 38. In how many ways can 8 boys and 5 girls be seated around a circular table such that no two girls sit together? 39. How many 7-digit numbers can be formed using the digits 0,1,2,3,4,5,6, without repetition, such that the number is divisible by 5 and the digits 1 and 2 are not adjacent? 40. In how many ways can 6 men and 5 women be arranged in a row such that no two women are together and two particular men must always be together? 41. A committee of 6 is to be selected from 8 men and 7 women. In how many ways can this be done if the committee must contain at least 3 women and at least 2 men? 42. From 10 students consisting of 6 boys and 4 girls, a team of 5 is to be selected. In how many ways can the team be formed if at least 2 boys and at least 2 girls must be selected? 43. How many numbers greater than 30,000 but less than 70,000 can be formed using the digits 0,1,2,3,4,5,6,7,8 without repetition? 44. In how many ways can the letters of the word DAUGHTER be arranged so that: the vowels are always together, the vowels are never together? 45. How many 6-letter words (meaningful or meaningless) can be formed from the letters of MONDAY, using each letter at most once, such that the vowels occupy even positions? 46. In how many ways can 10 people sit around a circular table if two particular people must not sit together? 47. A class has 12 students. In how many ways can they be divided into three groups of 4 students each, if the groups are labelled A, B, and C? 48. In how many ways can 5 identical balls be distributed among 4 distinct boxes if each box must receive at least one ball? 49. From the numbers 1,2,3,...,15, how many ways can 5 numbers be selected such that no two selected numbers are consecutive? 50. A committee of 7 is to be formed from 5 men and 6 women. In how many ways can the committee be formed if: i. at least 3 women are included; ii. two particular women refuse to serve together;
5.	BIOLOGY
	SECTION A: MULTIPLE CHOICE QUESTIONS (15 Questions × 1 Mark = 15 Marks) Q1. The defining characteristic of all living organisms that is entirely absent in non-living objects is: (a) Growth by increase in mass (b) Cellular organization & metabolism (c) Ability to move (d) Increase in surface area Q2. In the binomial nomenclature system proposed by Carolus Linnaeus, the two components of a biological name represent: (a) Order and Family (b) Genus and Specific epithet (c) Class and Phylum (d) Family and Genus Q3. Organisms known as 'chief producers in the oceans' belonging to kingdom Protista are: (a) Dinoflagellates (b) Euglenoids (c) Diatoms (d) Cyanobacteria Q4. Naked genetic material lacking a protein capsid is the defining characteristic of: (a) Prions (b) Viroids (c) Bacteriophages (d) Lichens

- Q5. Peat, widely used as fuel and packing material for trans-shipment of living material, is obtained from:
 (a) Marchantia (b) Funaria
 (c) Sphagnum (d) Riccia
- Q6. Which group of plant kingdom produces naked seeds that are not enclosed within an ovary wall?
 (a) Pteridophytes (b) Gymnosperms
 (c) Bryophytes (d) Angiosperms
- Q7. Inclusion bodies found in prokaryotic cells:
 (a) Are membrane-bound vesicles (b) Lie free in cytoplasm storing reserves
 (c) Are involved in aerobic respiration (d) Help in active transport
- Q8. The fluid mosaic model of the plasma membrane was proposed by Singer and Nicolson in:
 (a) 1953 (b) 1972
 (c) 1969 (d) 1838
- Q9. Crossing over during meiosis occurs at which specific substage of Prophase I?
 (a) Leptotene (b) Zygotene
 (c) Pachytene (d) Diplotene
- Q10. The stage of mitosis characterized by the alignment of chromosomes at the equatorial plate is:
 (a) Prophase (b) Metaphase
 (c) Anaphase (d) Telophase
- Q11. A competitive inhibitor of the enzyme succinic dehydrogenase is:
 (a) Malate (b) Malonate
 (c) Oxaloacetate (d) Fumarate
- Q12. Which of the following carbohydrates is a non-reducing sugar?
 (a) Glucose (b) Maltose
 (c) Sucrose (d) Ribose
- Q13. The respiratory organ in a frog that functions exclusively on land is:
 (a) Skin (Cutaneous respiration) (b) Buccopharyngeal cavity
 (c) Lungs (Pulmonary respiration) (d) Gills
- Q14. The triangular structure that joins the right atrium of frog's heart and receives blood from vena cava is:
 (a) Conus arteriosus (b) Sinus venosus
 (c) Truncus arteriosus (d) Ventricle
- Q15. Mature erythrocytes (RBCs) in *Rana tigrina* are:
 (a) Enucleated and biconcave (b) Nucleated and oval/biconvex
 (c) Enucleated and spherical (d) Nucleated and sickle-shaped

SECTION B: SHORT ANSWER TYPE - I (15 Questions × 2 Marks = 30 Marks)

- Q16. State the significance of the binomial nomenclature system and identify the specific rule regarding Latinisation of biological names.
- Q17. Differentiate between homosporous and heterosporous pteridophytes with one representative example of each.
- Q18. Why are mycorrhiza and coralloid roots ecologically significant in gymnosperms? Name the specific genus associated with each.
- Q19. Give two key structural and biochemical differences between Gram-positive and Gram-negative bacterial cell envelopes.
- Q20. Mention two structural and functional differences between rough endoplasmic reticulum (RER) and smooth endoplasmic reticulum (SER).
- Q21. What is the G0 (quiescent) stage of the cell cycle? Mention one cell type in adult humans that resides permanently in this stage.
- Q22. Define a peptide bond and illustrate its formation between two amino acids with a chemical representation.
- Q23. Differentiate between prosthetic groups and co-enzymes as enzyme cofactors, citing one example of each.
- Q24. Name the two major types of secondary structures found in proteins and state the type of bonding that stabilizes them.
- Q25. Describe the anatomical structure and hearing function of the 'tympanum' in *Rana tigrina*.

- Q26. How do male frogs differ morphologically from female frogs during the breeding season? Mention two distinct sexual dimorphic traits.
- Q27. What is a 'mesosome'? State two vital physiological functions it performs in prokaryotes.
- Q28. Mention the chemical nature of chitin and specify two major locations where it is found in biological systems.
- Q29. Explain the physiological roles of the sinus venosus and conus arteriosus in the circulatory system of a frog.
- Q30. Explain the biological significance of ribozymes. How do they fundamentally differ from conventional protein enzymes?

SECTION C: SHORT ANSWER TYPE - II (10 Questions × 3 Marks = 30 Marks)

- Q31. Describe the key characteristics of Kingdom Fungi based on: (a) Cell wall composition, (b) Modes of nutrition, and (c) Types of asexual spores produced.
- Q32. Explain the haplodiplontic life cycle pattern in plants. Draw a schematic cycle and name two plant groups exhibiting this life cycle.
- Q33. Explain the Endomembrane System in eukaryotic cells. List its four constituent organelles and explain why peroxisomes are excluded.
- Q34. Describe the ultrastructure of a eukaryotic cilium/flagellum with reference to its (9+2) axonemal arrangement and central sheath.
- Q35. Tabulate the key cytological events occurring in the five sequential substages of Prophase I of Meiosis (Leptotene, Zygotene, Pachytene, Diplotene, Diakinesis).
- Q36. Describe the concept of K_m (Michaelis constant) in enzyme kinetics. Explain how a competitive inhibitor affects V_{max} and K_m value with the help of a graph.
- Q37. Explain the Watson-Crick double-helical model of B-DNA with reference to: (a) Pitch and diameter, (b) Complementary base pairing, and (c) Antiparallel polarity.
- Q38. Describe the alimentary canal and digestive physiology of *Rana tigrina*, tracing the path of ingested food from mouth to cloaca.
- Q39. Describe the male urogenital system of a frog. Explain the specific anatomical route of sperm and the functional importance of Bidder's canal.
- Q40. Distinguish between anabolism and catabolism with suitable metabolic examples. Explain why ATP is referred to as the universal cellular energy currency.

SECTION D: LONG ANSWER TYPE (10 Questions × 5 Marks = 50 Marks)

- Q41. (a) Explain the Five Kingdom Classification proposed by R.H. Whittaker based on cell structure, body organization, mode of nutrition, reproduction, and phylogenetic relationships.
(b) Discuss the economic importance of Archaeobacteria (methanogens) and Cyanobacteria in agriculture and industry.
- Q42. (a) Systematically compare the three major classes of Algae (Chlorophyceae, Phaeophyceae, and Rhodophyceae) based on photosynthetic pigments, stored food material, and flagellar arrangement.
(b) Why are Bryophytes called the 'amphibians of the plant kingdom'? Explain their ecological role in plant succession on bare rocks.
- Q43. (a) Draw a neat, well-labeled diagram of a mitochondrion and detail its outer membrane, inner membrane, cristae, and matrix.
(b) Explain the 'Semi-Autonomous Organelle' hypothesis regarding mitochondria and chloroplasts with two supporting biological evidences.
- Q44. (a) Describe the detailed structural organization of a eukaryotic interphase nucleus (nuclear envelope, nuclear pores, nucleoplasm, chromatin, and nucleolus).
(b) Classify eukaryotic chromosomes into four morphological types based on the position of the centromere with neat diagrams.
- Q45. (a) Describe the complete sequence of mitotic cell division with labeled diagrams for Prophase, Metaphase, Anaphase, and Telophase.
(b) Explain the functional significance of mitosis in growth, genetic stability, and cell repair/regeneration in multicellular organisms.
- Q46. (a) Systematically differentiate between Mitosis and Meiosis across at least 5 distinct parameters.
(b) Explain how crossing over, chiasma formation, and independent assortment during meiosis contribute to genetic variation in sexually reproducing organisms.

	Q47. (a) Explain the four hierarchical levels of protein structure: Primary, Secondary (α-helix and β-pleated sheet), Tertiary, and Quaternary structures. (b) Differentiate between the 'Lock and Key' hypothesis and the 'Induced Fit' theory of enzyme-substrate interaction. Q48. (a) Distinguish between saturated and unsaturated fatty acids, and define triglycerides and phospholipids with their structural roles. (b) Describe factors affecting enzyme activity with appropriate graphical curves: (i) Temperature, (ii) pH, and (iii) Substrate concentration. Q49. (a) Detail the anatomical structure and working mechanism of the three-chambered heart of a frog, including the path of blood flow. (b) Describe the three structural divisions of the nervous system in <i>Rana tigrina</i> (CNS, PNS, and ANS) and list the cranial nerves. Q50. (a) Detail the three modes of respiration in <i>Rana tigrina</i> (Cutaneous, Buccopharyngeal, and Pulmonary). Explain how positive-pressure ventilation operates during pulmonary respiration. (b) Describe the sensory structures found in frogs for touch, taste, smell, vision, and equilibrium/hearing.
6.	INFORMATICS PRACTICES
	Level 1 Q1. Predict the output 1. <code>print("Computer", "Science", sep=" - ")</code> <code>print("Class", 11, end=" ")</code> <code>print("Python")</code> 2. <code>x, y, z = 5, 10, 15</code> <code>x = x + 5</code> <code>y = y - 2</code> <code>z = z * 2</code> <code>print(x, y, z, sep=":")</code> 3. <code>print("A", "B", "C", sep="@@")</code> <code>print("D", end="\$\$")</code> <code>print("E", "F", sep="-")</code> 4. <code>x = 5 / 2</code> <code>y = x * 4</code> <code>z = x + y</code> <code>x += y // 2</code> <code>y -= x + z</code> <code>z *= x</code> <code>print(x, y, z)</code> 5. <code>a = 6</code> <code>b = 8</code> <code>a += b</code> <code>b *= a</code> <code>print(a, b)</code> 6. Given the following list: <code>L1 = [10, 20, ["Python", "Java"], 30, 40, ["HTML", "CSS"], 50, 60]</code> Predict the output of the following statements: (a) <code>L1[-1]</code> (b) <code>L1[2:5:2]</code> (c) <code>L1[2][1]</code> (d) <code>L1[2][0][0:3]</code> 7. <code>List1 = [5, 10, 15, 20, 25]</code> <code>List2 = List1</code> <code>List3 = List1.copy()</code> <code>List1[2] = 50</code> <code>List2[4] = 100</code> <code>List1.remove(10)</code> <code>print("List1", List1)</code>

```

print("List2", List2)
print("List3", List3)
8. L = [35, 10, 50, 20, 40]
   L.sort()
   print(L)
   L.reverse()
   print(L)
   L.remove(20)
   print(L)
   print(L.pop())
   print(L)
   print(L.index(35))
9. b = "Introduction to Python Programming"
   a = list(b)

   1. print(a)
   2. print(len(a))
   3. print(a[2:8])
   4. print(a[:10])
   5. print(a[5:15:2])
   6. print(a[-1:-10:-1])
   7. print(a[::-3])
   8. print(a[-2:-15:-2])
   9. print(a[10:25])
   10. print(a[15:5:-1])
   11. print(a[-8:])
   12. print(a[:-5])
   13. print(a[3:-3])
   14. print(a[::-1])
   15. print(a[1:20:3])

```

Q2. Expand the following: **a.** BIOS **b.** DVD **c.** SRam

Level 2

Q1. Write a program to get product name, selling price and GST rate and then print invoice along with SGST and CGST.

Q2. Write a program in Python to display only those state which start with character 'm' or 'M' take the state from the user.

Q3. Write a menu-driven program to perform the following tasks:

- Calculate the **Area of Triangle** — Formula: $\frac{1}{2} \times \text{base} \times \text{height}$
- Calculate the **Perimeter of Rectangle** — Formula: $2 \times (\text{length} + \text{breadth})$
- Calculate the **Area of Square** — Formula: $\text{side} \times \text{side}$
- Calculate the **Perimeter of Circle** — Formula: $2 \times 3.14 \times r$
- Exit

Q4. Write a python program to add 10 in all odd values and 5 in even values to the given list.
L=[10,15,20,25,30,35,40]

Q5. Write a python program to input three number and find the greatest among three number.

Q6. Write a program to print even number from 1 to 100 using for loop.

Q7. Write a program to print even number from 1 to 100 using while loop.

Q8. Write a program to check whether a given number is a prime number or not.

Q9. Write a program to **check whether a given number is positive, negative, or zero.**

Q10. Write a program to **accept a number from 1 to 7 and display the corresponding day**, where 1 represents Monday, 2 represents Tuesday, and so on.

	Q11. Write a program to accept a number from 1 to 12 and display the corresponding month and the number of days in that month. For example, 1 represents January (31 days), 2 represents February (28 days), and so on.
7.	PHYSICAL EDUCATION Easy Level – 10 Questions 1. What is Physical Education? 2. Name any two careers related to Physical Education. 3. What are the three main Olympic Values? 4. What is meant by Yoga? 5. Name any two benefits of Yoga. 6. What is meant by CWSN? 7. What is inclusive Physical Education? 8. What is Anatomy? 9. What is Physiology? 10. Name any three types of muscles found in the human body. Medium Level – 10 Questions 11. Explain any three changing trends in modern Physical Education and sports. 12. Explain the importance of technology in improving sports performance. 13. Explain the importance of Excellence, Friendship and Respect in sports. 14. How does regular Yoga practice help in maintaining physical and mental health? 15. Explain the role of Yoga in managing lifestyle diseases. 16. Explain the importance of Physical Education and sports for Children With Special Needs (CWSN). 17. What modifications can be made in sports activities to make them suitable for CWSN? 18. Explain the major functions of the skeletal system. 19. Differentiate between skeletal muscles, smooth muscles and cardiac muscles. 20. Explain the changes that occur in the heart and respiratory system during exercise. Hard Level – 10 Questions 21. “Technology has made modern sports more scientific and competitive.” Analyse the statement with suitable examples. 22. Discuss how changing trends in Physical Education have created new career opportunities for students. 23. “Winning is important, but fair play and sportsmanship are more important.” Discuss the statement in relation to Olympic Values. 24. Analyse how Yoga can contribute to the prevention and management of lifestyle diseases. 25. “Yoga is a holistic approach to physical, mental and emotional well-being.” Justify the statement. 26. Analyse the role of inclusive Physical Education in the physical, psychological and social development of CWSN. 27. A school has students with different types of disabilities. Suggest suitable strategies that a Physical Education teacher can use to ensure their active participation in sports. 28. Analyse the relationship between the skeletal, muscular and nervous systems during sports activities. 29. Explain the immediate physiological changes that occur in the cardiovascular and respiratory systems during vigorous exercise and their importance for sports performance. 30. Case Study: A student spends most of the day sitting, has poor posture, low fitness and difficulty concentrating. As a Physical Education teacher, suggest a suitable combination of Yoga, physical activities and lifestyle modifications for the student. Explain how these interventions can improve the student's overall health.
8.	PSYCHOLOGY Easy Level – 10 Questions 1. Full form of PTSD. 2. What is Emotion? 3. What is Geometrical Illusion. 4. Mention different Perceptual constancies. 5. Which psychologists gave several laws to understand stimuli? 6. Mention different types of challenges of adolescence? 7. Different between Gross and fine Motor Skills? 8. Mention different Ethical issues? 9. Mention different types of branches of psychology? 10. Steps in conducting Scientific Research? Intermediate Level – 10 Questions

- 1.Explain Maslow’s Hierarchy of needs with diagram?
2. Explain the Motivational cycle.
- 3.What is processing Approaches in Perception?
- 4.Factors affecting Sustained attention and Selective attention?
- 5.Mention Functional Limitations of Sense Organs?
- 6.Explain Gender and Sex Roles?
- 7.Explain Jean Piaget’s Cognitive Development theory with examples?
- 8.Difference between psychological testing and Survey?
9. Mention different types of data collection
- 10.What is Clinical and Counselling Psychology?

Hard Level – 10 Questions

1. A person may behave differently when alone and when surrounded by others. Explain how psychology can study such differences while considering both *internal mental processes and external environmental factors*.
2. Riya performs exceptionally well in class when she studies alone at home. However, during examinations, she becomes anxious and forgets answers she already knows. Her parents believe that she is lazy, while her teacher believes that she lacks confidence. A psychologist observes her study habits, interviews her, and analyses the situations in which her performance changes.
 - a) How would a psychologist study Riya's behavior scientifically?
 - b) Identify two psychological factors that may influence her performance.
 - c) Why would it be incorrect to conclude immediately that Riya is simply “lazy”?
 - d) Explain how behavior and mental processes are interconnected in this case.
- 3.Discuss the ethical issues involved in conducting psychological research with children and adolescents.
4. A researcher wants to study whether background music affects students' concentration. Twenty students are randomly divided into two groups. Group A studies with instrumental music, while Group B studies in silence. Both groups are given the same learning material and the same amount of time. Their performance is measured through a test.
 - a) Identify the **independent variable**.
 - b) Identify the **dependent variable**.
 - c) What is the purpose of random assignment?
 - d) Why should both groups be given the same study material and time?
 - e) Which research method is being used?
 - f) Mention one limitation of this study.
5. “Development is influenced by both heredity and environment.” Explain the interactionist view with suitable examples.
6. Aarav and Arjun are identical twins. Aarav grows up in an environment where he receives encouragement for sports, regular practice opportunities, and healthy guidance. Arjun has similar genetic potential but receives fewer opportunities and little encouragement. Over time, Aarav becomes highly skilled in sports, while Arjun does not show the same level of achievement.
 - a) What does this case demonstrate about heredity and environment?
 - b) Why is it incorrect to attribute Aarav's success only to genes?
 - c) Explain the role of environmental stimulation in development.
 - d) How does this case support the interactionist perspective?
7. Explain how the same sensory information may be perceived differently by two individuals.
8. During an important classroom discussion, Kabir is trying to listen carefully to his teacher. At the same time, several students are whispering, someone is moving outside the classroom, and a message notification appears on his phone. Kabir manages to focus only on the teacher's voice.
 - a) Which psychological process is illustrated?
 - b) Explain how selective attention operates in this situation.
 - c) Identify two distractors from the case.
 - d) Why might Kabir fail to remember some information if his attention shifts to the phone notification?
 - e) How does motivation influence attention in this case?
- 9.Explain how intrinsic and extrinsic motivation may influence the same behavior differently.

	10. Before giving a presentation, Rohan notices that his heart is beating faster and his hands are slightly sweaty. He interprets these physical changes as nervousness. After beginning the presentation and receiving positive responses, he starts feeling confident and excited. a) Identify the physiological changes mentioned in the case. b) How are physiological arousal and emotion related? c) Why might Rohan's emotional experience change after receiving positive feedback? d) Explain how cognitive interpretation can influence emotion. e) Which component of emotion is represented by Rohan's physical reactions?
9.	ARTIFICIAL INTELLIGENCE
	Level-1: Q.1 What is Artificial Intelligence (AI)? Explain with an example. Q.2 What are the different types of Artificial Intelligence? Q.3 What are the major domains of Artificial Intelligence? Name any four. Q.4 Define Data. What are the different types of data? Q.5 What are the advantages of using a Word Processor? Q.6 What are the common word processing applications available on computers? Q.7 What is the purpose of spelling and grammar checkers? Q.8 What is the importance of grooming? Q.9 What are the benefits of teamwork? Q.10 What are the types of motivation? Q.11 What is algorithmic bias? Give a suitable example. Q.12 Define AI Ethics. Q.13 What is the difference between Machine Learning and Deep Learning? Q.14 Why is transparency important in AI systems? Q.15 What is the basic interface of LibreOffice Writer? Name any four components. Level-2 Q.16 Explain the evolution of Artificial Intelligence (AI). Q.17 Explain any four major domains of Artificial Intelligence. Q.18 Explain the different types of data with suitable examples. Q.19 How can you set goals in self-management? Explain the process. Q.20 What are the techniques for effective time management? Explain any four. Q.21 Write a Python program to input the Principal Amount (P), Rate of Interest (R), and Time (T), and calculate the Simple Interest (SI). Formula: $SI = (P \times R \times T) / 100$ Q.22 Write a Python program to find the largest (maximum) of three numbers. Q.23 Write a Python program to print the series 1 2 3 4 5 using both for and while loops. Q.24 Write a Python program to print the multiplication table of any number entered by the user using a for loop. Q.25 Explain the importance of AI Ethics in the development and use of AI systems.