

New Era Progressive School

Korba

Dussehra Holiday Home Work

Class -XII

CHEMISTRY

Lab Manual – Instructions

Complete the following practicals in your Chemistry Lab Manual in the given order:

1. Classification of Anions.
2. Classification of Cations.
3. To analyse the given inorganic salt for acidic and basic radicals.
4. To analyse the given inorganic salt for acidic and basic radicals.
5. To analyse the given inorganic salt for acidic and basic radicals.
6. To prepare an M/20 standard solution of oxalic acid and, using this solution, determine the molarity of the given potassium permanganate solution.
7. To prepare an M/20 standard solution of ferrous ammonium sulphate (Mohr's salt) and, using this solution, determine the molarity of the given potassium permanganate solution.
8. To prepare crystals of ferrous ammonium sulphate (Mohr's salt).
9. To separate the coloured components present in a mixture of red and blue inks by ascending paper chromatography and determine their (R_f) values.
10. Detection of the functional group $-OH$.
11. Detection of the functional group $-COOH$.
12. Detection of the functional group $-CHO$.
13. Detection of the functional group $>C=O$.

Instructions for Writing the Lab Manual

Write each practical using the following headings in the given order:

1. Aim
2. Materials Required
3. Theory
4. Observation Table
5. Conclusion
6. Result
7. Precautions (Write any two.)

Important Notes:

Draw all diagrams, observation tables, calculations, and chemical reactions on the unruled pages of the lab manual.

Write the remaining content neatly on the ruled pages.

Use a pencil for diagrams and tables wherever appropriate.

Write all chemical equations correctly and balance them wherever required.

Maintain neatness, cleanliness, and proper presentation throughout the lab manual.

Complete all practicals in the prescribed order.

BUSINESS STUDY

Topic: Prepare Annual Project File on "Marketing Management"

Instructions for Students:

1. File must have Cover Page, Certificate, Acknowledgement and Index.
2. Content should include: Introduction, Concept & Features of Marketing Management, Functions of Marketing, Difference between Marketing and Selling, Marketing Mix (Product, Price, Place, Promotion) with examples, Conclusion and Bibliography.
3. Project should be hand-written, neat and creative.
4. Use diagrams, pictures, charts and real-life examples wherever required.

ENTREPRENEURSHIP

Prepare a Project File on "My Startup Business Plan" with Name, Product, Marketing Strategy and Finance details + Case Study of one Successful Entrepreneur.

ENGLISH

Prepare a Project Portfolio on the poem A Roadside Stand by Robert Frost. Include the following in it.

- Front page
- Acknowledgement
- Certificate
- Index
- **About the poet**
- **Summary of the poem**
- **Social Commentary:** Critique the stark contrast Frost draws between the city dwellers and the rural poor. What is the "childish longing in vain" that the poet refers to?
- **Tone & Emotion:** Analyze the shifts in the poet's tone—from empathy for the roadside stand owners to intense frustration and anger at the "greedy good-doers."

- **Economic Perspective:** Discuss the economic disparity presented in the poem. How does the "cash" flow (or lack thereof) determine the dignity of human life in rural areas?
- **Bibliography**

COMMERCE

Subject 1: **Accountancy**

Chapter 8 – **Accounting for Share Capital**

1. Define share capital and explain any two types of share capital.
2. Differentiate between equity shares and preference shares.
3. What is meant by oversubscription of shares?
4. Pass journal entries for the issue of 500 shares of ₹10 each at par, payable in full on application.
5. Solve any two textbook questions based on the issue and forfeiture of shares.

Subject 2: Macroeconomics

Chapter – Aggregate Demand and Related Concepts

6. Define aggregate demand.
7. Explain the four components of aggregate demand.
8. Differentiate between average propensity to consume (APC) and marginal propensity to consume (MPC).
9. If consumption $C=100+0.8Y$ calculate consumption when income is ₹500 and ₹1,000.
10. Explain the concept consumption function .Use diagram.

☐ General Instructions

- * Complete all work neatly in your subject notebooks.
- * Show proper working notes for numerical questions.
- * Draw diagrams with pencil and label them clearly.
- * Revise both chapters after completing the homework.
- ☐ Enjoy your holidays and celebrate Dussehra responsibly! ☐

KATHAK

As part of your Holiday Homework, preparing and submitting the Kathak Project File is compulsory for all students.

Along with the Kathak section, each student must also include a write-up on any one other Indian Classical Dance Form of their choice.

Please ensure that your project file is complete, neatly presented, and submitted on the reopening day without fail.

Computer Science

Complete your 25 questions practical file with different question from the syllabus of class XII

Write question and program on lining page and output in white page on left side of your practical file.

Write single program on one page.

MATHS

PART A: LINEAR PROGRAMMING

Experiment 1: Graphical Solution of a Linear Programming Problem

Aim: To solve a linear programming problem graphically and find the maximum value of the objective function.

Objective function: Maximize $Z = 3x + 2y$

Subject to the constraints:

$$x + y \leq 4$$

$$x \leq 2$$

$$x \geq 0, y \geq 0$$

Procedure

1. Draw the coordinate axes.
2. Draw the line $x + y = 4$, passing through $(4, 0)$ and $(0, 4)$.
3. Draw the line $x = 2$.
4. Shade the region satisfying all constraints.
5. Identify the corner points of the feasible region.

Corner points: $(0, 0)$, $(2, 0)$, $(2, 2)$, $(0, 4)$.

Corner Point	$Z = 3x + 2y$
$(0, 0)$	0
$(2, 0)$	6
$(2, 2)$	10
$(0, 4)$	8

Result: The maximum value of Z is 10, attained at $(2, 2)$.

Experiment 2: Minimization of a Linear Programming Problem

Aim: To find the minimum value of an objective function using the graphical method.

Objective function: Minimize $Z = 2x + 3y$

Subject to the constraints:

$$x + y \geq 4$$

$$x + 2y \geq 6$$

$$x \geq 0, y \geq 0$$

Procedure

6. Draw the lines $x + y = 4$ and $x + 2y = 6$.
7. Shade the common region satisfying the constraints.
8. Find the corner points of the feasible region.

9. Calculate Z at each relevant corner point.

Intersection of the two lines:

$$x + y = 4 \text{ and } x + 2y = 6$$

Subtracting the first equation from the second gives $y = 2$. Hence $x = 2$.

The intersection point is $(2, 2)$.

Corner Point	$Z = 2x + 3y$
$(0, 4)$	12
$(2, 2)$	10
$(6, 0)$	12

Result: The minimum value of Z is 10, attained at $(2, 2)$.

PART B: VECTOR ALGEBRA

Experiment 3: Verification of the Triangle Law of Vector Addition

Aim: To verify the triangle law of vector addition.

Theory: If two vectors are represented by two sides of a triangle taken in the same order, their sum is represented by the third side taken in the opposite order.

If $\vec{AB} = \vec{a}$ and $\vec{BC} = \vec{b}$, then $\vec{AB} + \vec{BC} = \vec{AC}$. Therefore, $\vec{a} + \vec{b} = \vec{AC}$.

Example:

$$\text{Let } \vec{a} = 2\hat{i} + 3\hat{j} \text{ and } \vec{b} = 4\hat{i} + \hat{j}.$$

$$\vec{a} + \vec{b} = (2 + 4)\hat{i} + (3 + 1)\hat{j} = 6\hat{i} + 4\hat{j}.$$

Result: The triangle law of vector addition is verified algebraically.

Experiment 4: Verification of the Commutative Law of Vector Addition

Aim: To verify that vector addition is commutative.

Theory: For any two vectors $\vec{a}$ and $\vec{b}$, $\vec{a} + \vec{b} = \vec{b} + \vec{a}$.

$$\text{Let } \vec{a} = 2\hat{i} + 3\hat{j} + 4\hat{k} \text{ and } \vec{b} = \hat{i} + 2\hat{j} + 3\hat{k}.$$

$$\vec{a} + \vec{b} = 3\hat{i} + 5\hat{j} + 7\hat{k}.$$

$$\text{Similarly, } \vec{b} + \vec{a} = 3\hat{i} + 5\hat{j} + 7\hat{k}.$$

$$\text{Therefore, } \vec{a} + \vec{b} = \vec{b} + \vec{a}.$$

Result: The commutative law of vector addition is verified.

Experiment 5: Finding the Dot Product of Two Vectors

Aim: To calculate the scalar product of two vectors.

Theory: $\vec{a} \cdot \vec{b} = |\vec{a}| |\vec{b}| \cos \theta$.

In component form, if $\vec{a} = a_1\hat{i} + a_2\hat{j} + a_3\hat{k}$ and $\vec{b} = b_1\hat{i} + b_2\hat{j} + b_3\hat{k}$, then $\vec{a} \cdot \vec{b} = a_1b_1 + a_2b_2 + a_3b_3$.

$$\text{Example: Let } \vec{a} = 2\hat{i} + 3\hat{j} + 4\hat{k} \text{ and } \vec{b} = \hat{i} + 2\hat{j} + 3\hat{k}.$$

$$\vec{a} \cdot \vec{b} = (2)(1) + (3)(2) + (4)(3) = 2 + 6 + 12 = 20.$$

Result: The scalar product of the given vectors is 20.

Experiment 6: Finding the Cross Product of Two Vectors

Aim: To calculate the vector product of two vectors.

Theory: $\vec{a} \times \vec{b} = |\vec{a}| |\vec{b}| \sin \theta \hat{n}$, where $\hat{n}$ is a unit vector perpendicular to both vectors.

In determinant form:

$$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}$$

Example: Let $\vec{a} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{b} = 2\hat{i} + \hat{j} + \hat{k}$.

$$\vec{a} \times \vec{b} = \hat{i}(2 - 3) - \hat{j}(1 - 6) + \hat{k}(1 - 4)$$

$$= -\hat{i} + 5\hat{j} - 3\hat{k}.$$

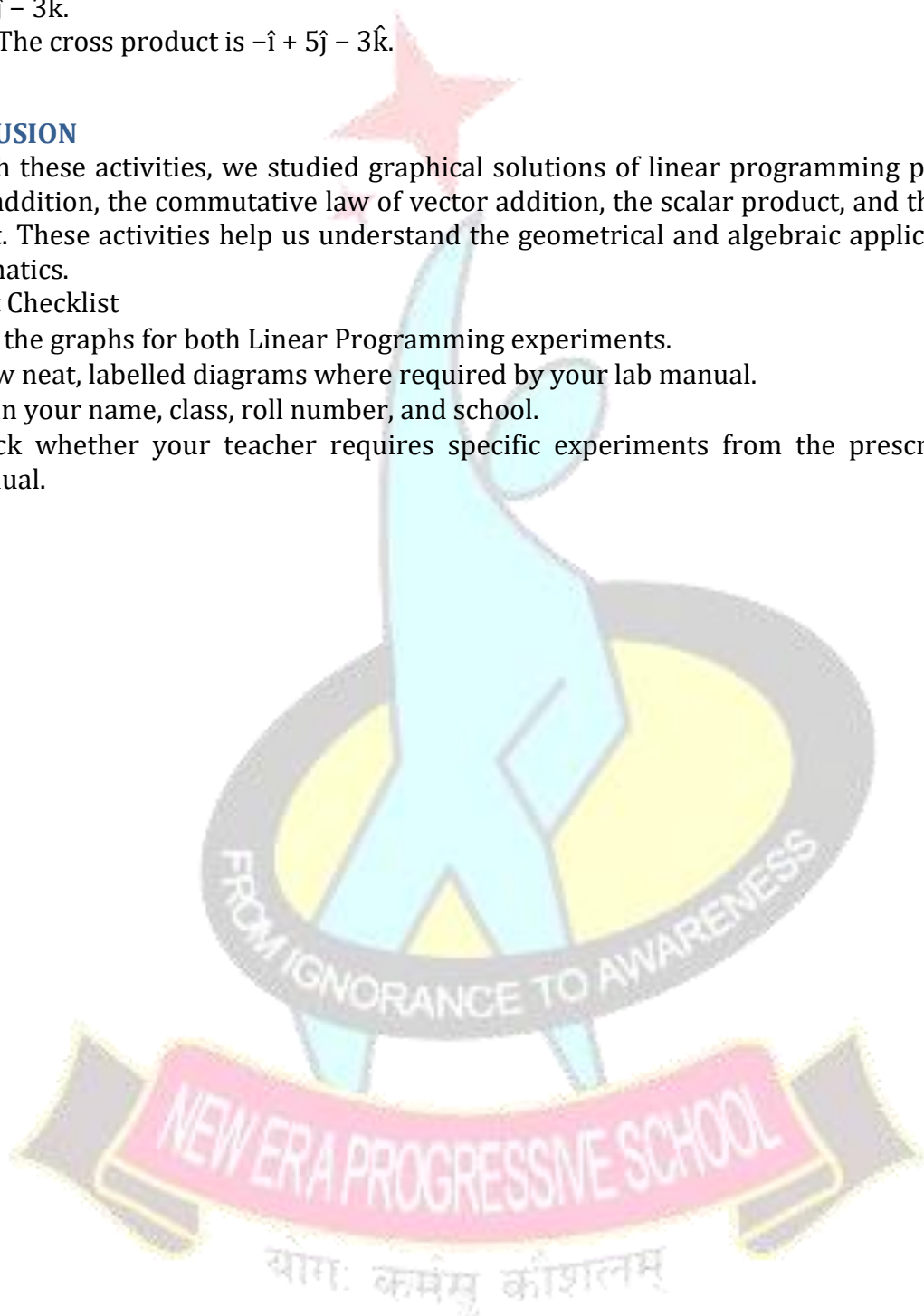
Result: The cross product is $-\hat{i} + 5\hat{j} - 3\hat{k}$.

CONCLUSION

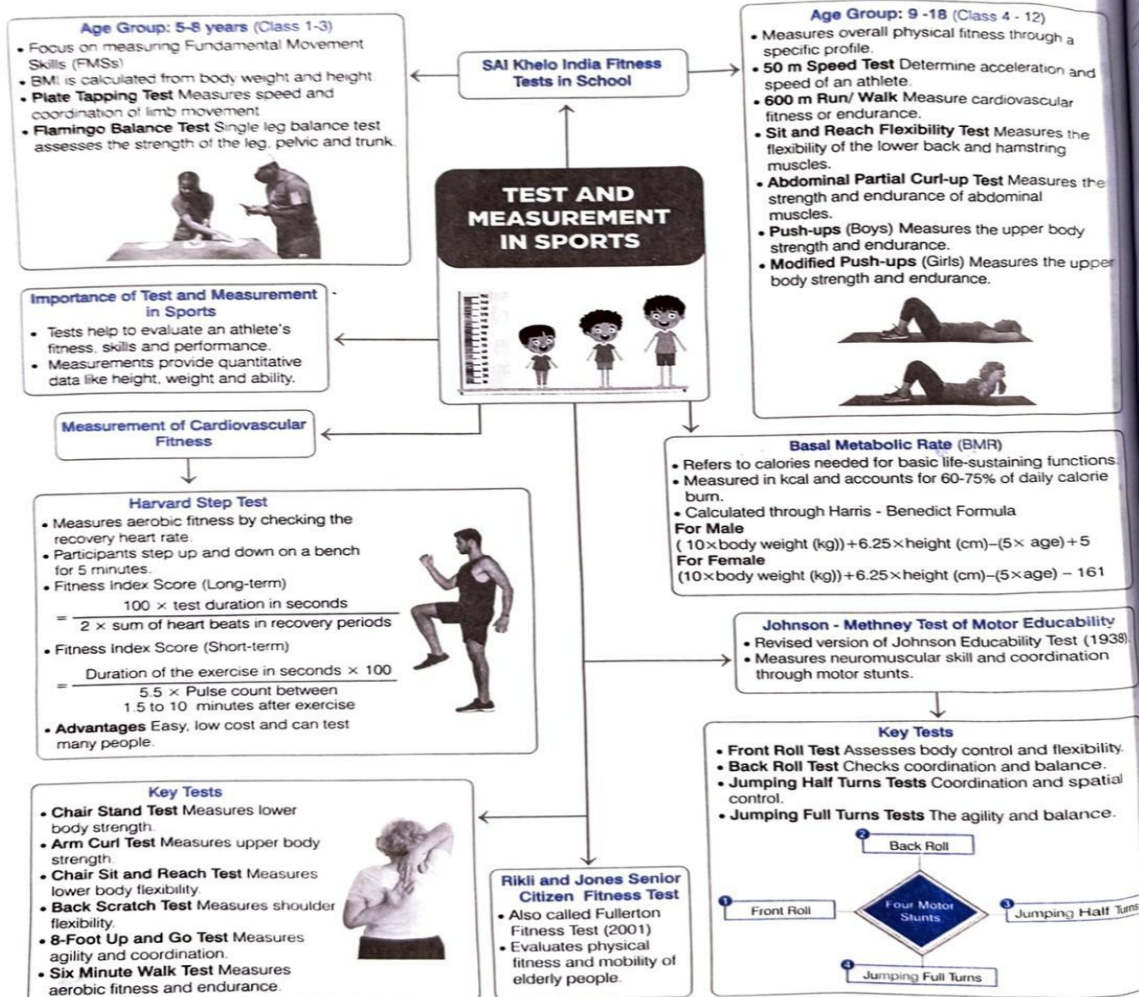
Through these activities, we studied graphical solutions of linear programming problems, vector addition, the commutative law of vector addition, the scalar product, and the vector product. These activities help us understand the geometrical and algebraic applications of Mathematics.

Student Checklist

- Add the graphs for both Linear Programming experiments.
- Draw neat, labelled diagrams where required by your lab manual.
- Fill in your name, class, roll number, and school.
- Check whether your teacher requires specific experiments from the prescribed lab manual.



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SELF ASSESSMENT



Multiple Choice Questions

- Q.1 Which of the following is an example of dynamic equilibrium?
- A Sportsperson is running
B Sportsperson is taking part in gymnastics
C Standing one leg
D Both A and B
- Q.2 Which law of motion states "for every action there is always an equal and opposite reaction?"
- A First B Second
C Third D None of these
- Q.3 Dynamic friction is the force opposing motion of one body over the surface of another body when
- A the bodies are not in contact with each other
B the bodies have not yet started moving
C one body is actually moving
D None of the above
- Q.4 Match the following List-I with List-II

List-I (Projectile Factor)	List-II (Effect)
A. Angle of release	1. Determines how far and fast it travels.
B. Speed of release	2. Influences trajectory height and distance.
C. Air resistance	3. Causes a ball to dip faster.
D. Spin	4. Slows down the projectile.

	A	B	C	D		A	B	C	D
A	2	1	4	3	B	1	2	3	4
C	3	4	2	1	D	4	3	1	2

- Q.5 **Assertion (A)** Friction is necessary for athletes to run on the track.

Reason (R) Without friction, the feet would slip and athletes could not move forward.

Codes

- A Both A and R are true, and R is the correct explanation of A.
B Both A and R are true, but R is not the correct explanation of A.
C A is true, but R is false.
D A is false, but R is true.

Very Short Answer Type Questions

- Q.6 Give an example to show the application of Newton's third law of motion in sports.
- Q.7 Explain sliding friction.
- Q.8 State two instances where friction is advantageous in sports.

Short Answer Type Questions

- Q.9 Explain how Newton's first and second laws are applicable in a game of basketball.
- Q.10 How movement of air and friction can become a disadvantage for a cyclist?
- Q.11 Why athletes prefer to wear spikes while running on the track?

Long Answer Type Questions

- Q.12 Enlist the various roles of friction in sports.
- Q.13 State in brief about application of centre of gravity in sports.

First Law (Law of Inertia)

- Body remains at rest or in motion unless acted upon by an external force.
- **Application** A soccer ball continues rolling until friction stops it.

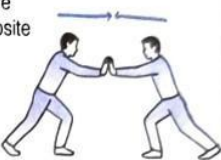


Second Law (Law of Acceleration)

- Acceleration is directly proportional to the force and inversely proportional to mass.
- **Application** - A harder hit in baseball makes the ball accelerate faster.

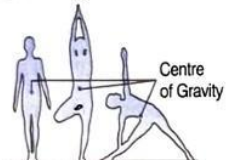
Third Law (Law of Momentum)

- For every action, there is an equal and opposite reaction.
- **Application** A swimmer pushes water backwards to propel themselves forward.



Equilibrium

- A state of balance where the body is stable.
- **Centre of Gravity (CoG)** is a point where body's total weight is concentrated.



Static Equilibrium

A state of balance, occurs when body is at rest. For example, standing on one leg.

Dynamic Equilibrium

Occurs when body is in motion at a constant velocity. For example, while running.

Static Friction

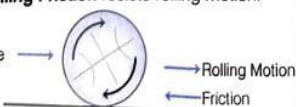
Acts on an object at rest. For example, a tennis ball before it is hit.



Dynamic Friction

Acts on moving objects.

- **Sliding Friction** resists sliding motion.
- **Rolling Friction** resists rolling motion.



Newton's Laws of Motion

BIOMECHANICS AND SPORTS



Friction and Sports

Friction is a force that opposes motion.

Fluid Friction

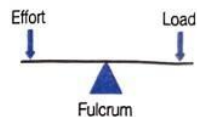
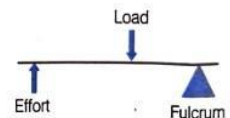
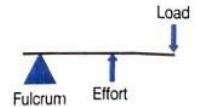
Occurs when moving through fluids like air or water (e.g., Swimming).

Levers

- A lever is a rigid bar that rotates around a fulcrum to move a load.

Types of Lever

- **First Class Lever** Fulcrum in the middle (e.g., Head movement)
- **Second Class Lever** Load in the middle (e.g., Biceps curl).
- **Third Class Lever** Effort in the middle.
- Levers increase force or speed.

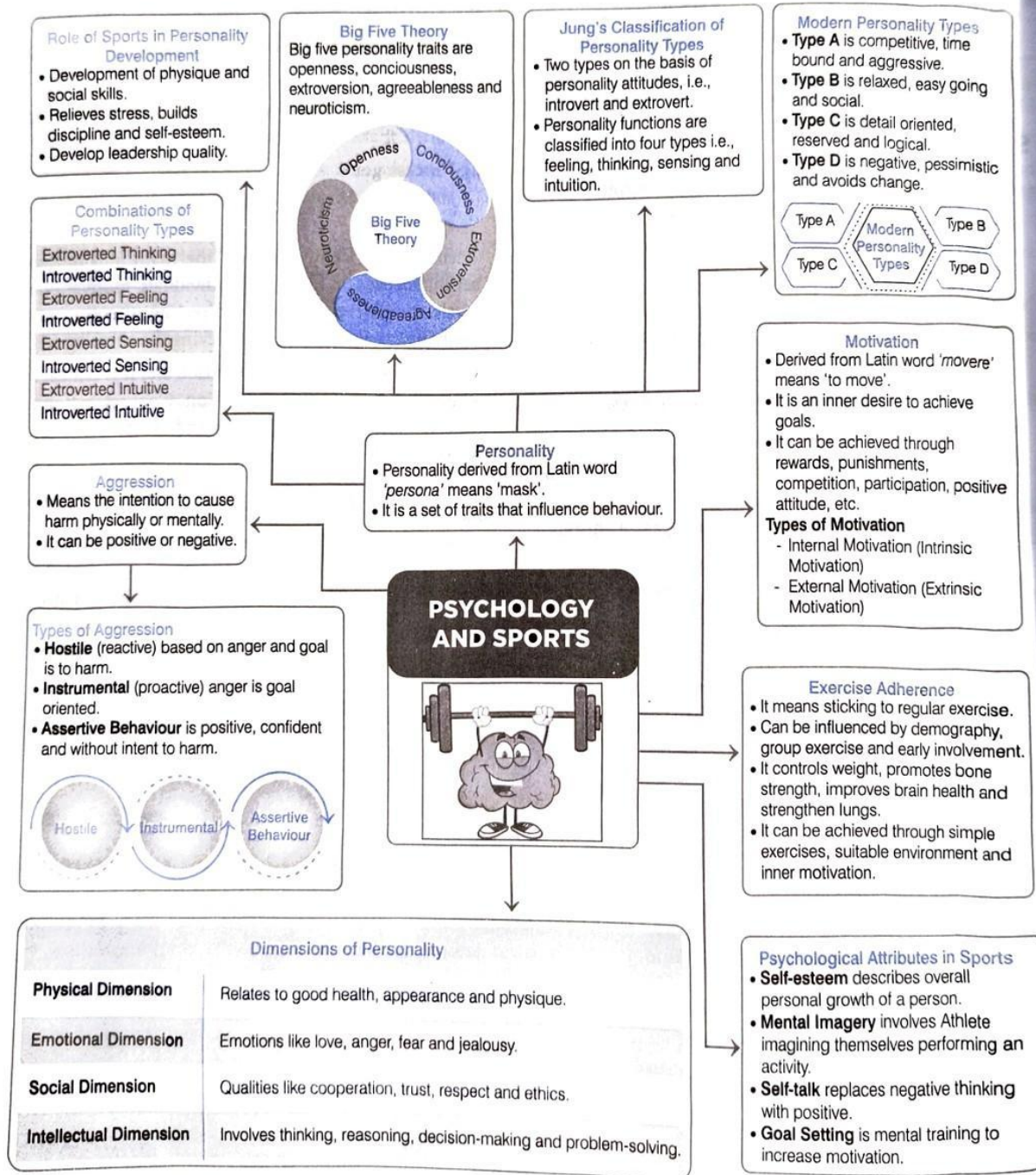
Projectile in Sports

- Projectiles move under gravity after release.
- Gravity pulls it downwards.
- Air resistance slows it.
- Speed, angle and height of release affect distance.
- Spin affects direction and stability.





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Last date of submission of Holiday Homework is 26/10/2026