

DAT SYLLABUS

Session: 2024-25

Stream: SCIENCE

A. CHEMISTRY

CLASS-IX:

1. **Particle nature and their basic units:** Atoms and molecules, Law of constant proportions, Atomic and molecular masses.
2. **Structure of atoms:** Electrons, protons and neutrons, valency, chemical formula of common compounds. Isotopes and Isobars.

CLASS-X:

1. **Chemical reactions:** Chemical equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction.
2. **Acids, bases and salts:** Their definitions in terms of furnishing of H^+ and OH^- ions, General properties, examples and uses, concept of pH scale (Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris.
3. **Metals and nonmetals:** Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds, Metallurgy.
4. **Carbon compounds:** Covalent bonding in carbon compounds. Versatile nature of carbon, Homologous series. Isomerism, organic reactions, soap and detergents, Nomenclature of organic compounds (IUPAC Name)

B. BIOLOGY

CLASS-IX

1. **Cell - Basic Unit of life:** Cell as a basic unit of life; prokaryotic and eukaryotic cells, multicellular organisms; cell membrane and cell wall, cell organelles and cell inclusions; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes - basic structure, number.
2. **Tissues, Organs, Organ System, Organism:** Structure and functions of animal and plant tissues (only four types of tissues in animals; Meristematic and Permanent tissues in plants).

CLASS-X

3. **Life processes:** 'Living Being'. Basic concept of nutrition, respiration, transport and excretion in plants and animals.
4. **Control and co-ordination in animals and plants:** Tropic movements in plants; Introduction of plant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary and reflex action; Chemical co-ordination; animal hormones.
5. **Reproduction:** Reproduction in animals and plants (asexual and sexual) reproductive health-need and methods of family planning. Safe sex vs HIV/AIDS. Child bearing and women's health.
6. **Heredity:** Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination: brief introduction;
7. **Our environment:** Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable substances.

C. PHYSICS

CLASS-IX

1. **Motion:** Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly

accelerated motion, equations of motion; elementary idea of uniform circular motion.

2. **Force and Newton's laws** : Force and Motion, Newton's Laws of Motion, Action and Reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration.

CLASS-X

3. **Natural Phenomena**-Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification.
Refraction; Laws of refraction, refractive index, Refraction of light through glass slab
Refraction of light by spherical lens; Image formation by spherical lenses; Lens formula (Derivation not required); Magnification. Power of a lens.
Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life. (excluding colour of the sun at sun rise and sun set)
Functioning of a lens in human eye, defects of vision and their corrections, applications of spherical mirrors and lenses. Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life (excluding colour of the sun at sunrise and sunset).
4. **Effect of Current**-Electric current, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R.
5. **Magnetic effects of current** : Magnetic field, field lines, field due to a current carrying straight conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's Left Hand Rule, Alternating current and Direct current (AC & DC), Domestic circuit frequency of AC, Advantage of AC over DC.

D. SUBJECT-MATHEMATICS

CLASS-X

1. REAL NUMBERS

Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of $\sqrt{2}, \sqrt{3}, \sqrt{5}$.

2. POLYNOMIALS

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials

3. PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Pair of linear equations in two variables and graphical method of their solution, consistency/inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination. Simple situational problems.

4. QUADRATIC EQUATIONS

Standard form of a quadratic equation $ax^2 + bx + c = 0$, ($a \neq 0$). Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots.

Situational problems based on quadratic equations related to day to day activities to be incorporated.

5. ARITHMETIC PROGRESSIONS

Arithmetic Progression Derivation of the n^{th} term and sum of the first n terms of A.P. and their application in solving daily life problems.

6. CO-ORDINATE GEOMETRY

Concepts of coordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division).

7. TRIANGLES

Definitions, examples, counter examples of similar triangle.

- I. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
- II. If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
- III. If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
- IV. If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
- V. If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

8. CIRCLES

Tangent to a circle at, point of contact

- I. The tangent at any point of a circle is perpendicular to the radius through the point of contact.
- II. The lengths of tangents drawn from an external point to a circle are equal.

9. INTRODUCTION TO TRIGONOMETRY

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined). Values of the trigonometric ratios of 30° , 45° and 60° . Relationships between the ratios.

10. TRIGONOMETRIC IDENTITIES

Proof and applications of the identity $\sin^2 A + \cos^2 A = 1$. Only simple identities to be given.

11. HEIGHTS AND DISTANCES: Angle of elevation, Angle of Depression.

Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30° , 45° , 60° .

12. AREAS RELATED TO CIRCLES

Area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60° , 90° and 120° only.

13. SURFACE AREAS AND VOLUMES

Surface areas and volumes of cubes, cuboids, spheres (including hemispheres) and right circular cylinders/cones.

14. STATISTICS

Mean, median and mode of grouped data (bimodal situation to be avoided).

15. PROBABILITY

Classical definition of probability. Simple problems on finding the probability of an event.