

SYLLABUS FOR DAV APPTITUDE TEST MATHEMATICS

- A. NUMBER SYSTEM:** Irrational Numbers, Real Numbers and their decimal expansion, operations on Real Numbers, Laws of exponents of Real Numbers.
- B. LINEAR EQUATION OF TWO VARIABLES:** Elimination & substitution method, consistency of linear equation, word problems excluding the reducible form of linear equation
- C. QUADRATIC EQUATION:** Standard form of a quadratic equation $ax^2 + bx + c = 0$, ($a \neq 0$). solutions of quadratic equations (only real roots). Relationship between discriminant and nature of roots. Situational problems (**reducible to quadratic equation are excluded**) based on quadratic equations related to day to day activities to be incorporated.
- D. ARITHMETIC PROGRESSION :** Motivation for studying Arithmetic Progression, Derivation of the n^{th} term and sum of the first n terms of A.P. & application of S_n (Word problems)
- E. POLYNOMIAL :** Zeros of a polynomial, relationship between zeros and coefficients of a quadratic polynomial.
- F. GEOMETRY :**
Triangle: BPT, criteria of similar triangles
Circle: Tangents to circle and its application.
- G. TRIGONOMETRY :** Trigonometry-ratio, Trigonometry -identity, Trigonometry-ratio of $0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ$
- H. HEIGHT & DISTANCES :** Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only $30^\circ, 45^\circ, 60^\circ$

- I. **PROBABILITY:** Classical definition of probability. Simple problems on single events.
- J. **COORDINATE GEOMETRY:** Concepts of coordinate geometry, Distance formula, Section formula (internal division).
- K. **AREAS RELATED TO CIRCLES:** Motivate the area of a circle, 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° , 120° plane figures involving triangles, simple quadrilaterals and circle should be taken.)
- L. **SURFACE AREAS AND VOLUMES:** Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders /cones. (Problems with combination of not more than two different solids be taken).

PHYSICS

Natural Phenomena

Laws of Reflection, Reflection of light by plain mirror, 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.

Laws of refraction, Refractive index, Refraction through glass slab. Refraction of light by spherical lens; Image formed 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.

Human Eye: Human eye, accommodation of eye, myopia, hypermetropia

Electricity

- (i) **Ohm's Law**; concepts of emf, potential difference, resistance and resistivity. Resistance in series and parallel combination; simple problems using combinations of resistors in circuits.
- (ii) **Electrical power and energy.**

Heating effects of electric current, measurement of electrical energy, $W = QV$ $H = VIt = I^2Rt = (V^2/R)t$ and electrical power $P = (W/t) = VI = I^2R = V^2/R$.

SI unit & Commercial Unit of Energy. Power rating of common appliances, household consumption of electric energy; calculation of total energy consumed by electrical appliances; $W = Pt$ (kilowatt x hour = kW h), simple numerical problems.

Magnetic Effects on electric Current

Magnetic Field, Magnetic Field Lines around bar magnet, circular loop, solenoid. Electromagnet and its application. Force on a current carrying conductor placed in magnetic field. Fleming's left hand rule.

CHEMISTRY

Chemical Substances: Nature and Behaviors

1. **Chemical Reactions and equations (Types of Chemical Reactions)**
2. **Carbon compounds:** Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series. Nomenclature of carbon compounds containing functional group. Chemical properties of carbon compounds, ethanol and ethanoic acid, soap and detergent.

- 3. Metals and Non Metals :** Properties of Metals and Non-metals, reactivity series formation and properties of ionic compound, metallurgy
- 4. Chemical Bonding:** Electrovalent, covalent and co-ordinate bonding, structures of various compounds - orbital structure and electron dot structure.

Definition of Electrovalent Bond.

Electrovalent compounds NaCl, MgCl₂, CaO;

Characteristic properties of electrovalent compounds - state of existence, melting and boiling points, conductivity (heat and electricity), ionisation in solution, dissociation in solution and in molten state to be linked with electrolysis.

Covalent Bond –

definition and example, structure of Covalent molecules on the basis of duplet and octet of electrons (example: Hydrogen, Chlorine, Nitrogen, Water, Ammonia, Carbon tetrachloride, Methane.)

Characteristic properties of Covalent compounds

State of existence, melting and boiling points, conductivity (heat and electricity), ionisation in solution.

5. Acids, Bases and Salts :

Properties of Acids and Base.

Compounds of Sodium (NaOH, Washing Soda, Baking Soda) – it's preparation and uses

Compounds of Calcium (Bleaching powder, Plaster of Paris) - it's preparation and uses

6. Mole Concept

BIOLOGY

WORLD OF LIVING

Life Processes: Digestion, Respiration, Body Fluids & Circulation, Excretion, Photosynthesis, Transpiration

Control and Coordination : Tropic movements in plants, introduction of plant hormones, control and coordination in animals, nervous system, voluntary, involuntary and reflex action, chemical coordination, animal hormones.

How do organisms reproduce: Reproduction in animals and plants (asexual and sexual) reproductive health-need and methods of family planning. Safe sex vs HIV/AIDS. Childbearing and women's health.

Heredity and Evolution: Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination.

Our environment: Eco-system, Environmental problems, Ozone depletion, waste production and their solutions.

Biodegradable and non-biodegradable substances.

Cell, Cell Organelles & their structure, function, cell cycle, cell division – mitosis, meiosis