



## GYAN-VIDYA MANDIR

### ACADEMIC CURRICULUM FOR SESSION [2024 – 26]

Respected Parents or Dear Students,

We are very happy and graceful to announce our 9<sup>th</sup> consecutive years of successful teaching and serve the society especially the students of Bihar.

We are very delighted to show our integrity, team work towards discipline in academics and results in different competitive exams.

We are providing all individual and essential information about the academic curriculum of the session [2024 – 2026].

Important information of Batch **GVM-A [24 – 26]**.

- i. The date of commencement of the Batch is **8<sup>th</sup> April 2024 (Monday) at 11:00 a.m.**
- ii. Before this there will be orientation programme at **5<sup>th</sup> April 2024 at 4:00 p.m.**
- iii. This is our most highlighted and result performing batch.
- iv. GVM best faculty will be educated this batch.
- v. This batch consist discussion of highly fundamental concepts for **90 hours**, which are essential to develop base for class 11<sup>th</sup> .
- vi. Course of class 11<sup>th</sup> in both sections. Physics, Chemistry, Mathematics and in Physics, Chemistry, Biology, will be covered in 9 months.  
*i.e., class 11<sup>th</sup> start at 8<sup>th</sup> April.*  
11<sup>th</sup> Start date – 8<sup>th</sup> April 2024  
11<sup>th</sup> End date – 25<sup>th</sup> February 2025
- vii. Topics covered in Fundamentals.  
**Physics** [Durations: 30 hours]  
Rest and motion, Concept of uniform of motion and Non – uniform motion, Concept of Inertia, Conservation of momentum, Concept of force and Net Force, Work and Energy  
**Chemistry** [Duration: 30 hours]  
Mole concept, Atomic Structure; Atomic mas, Atomic number, Fundamental practices, Thomson Model, Rutherford model, Electronic configuration, Hydrogen, Atoms, Ions, Molecules, Bonding (ionic, covalent).  
**Mathematics** [Duration: 30 hours]  
Number System, Polynomials, Co – Ordinate Geometry, Linear equation, Triangle, Quadrilateral, Circle, Basic trigonometry, Basic Logarithmic.  
**Biology** [Duration: 30 hours]  
Cell, Tissue: Plant Tissue & Animal Tissue, Human health and Disease (Why do we fall ill?), Biological classification.
- viii. This batch is highly helpful for school non – attending students who really want to focus on upcoming JEE Mains + Adv and NEET examination.  
Our best faculty are dedicated to give best education in order to achieve the target.

ix. Syllabus for Class 11<sup>th</sup> are:-

## Physics

- **UNIT 1: PHYSICS AND MEASUREMENT**

Units of measurements, Systems of Units, , S.I. Units, fundamental and derived units, least count, significant figures, Errors in measurements, Dimensions of Physics quantities, dimensional analysis, and its applications.

- **UNIT 2: KINEMATICS**

The frame of reference, motion in a straight line, Position-time graph, speed and velocity: Uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity-time, position-time graph, relations for uniformly accelerated motion, Scalars and Vectors, Vector. Relative velocity, Motion in a plane, Projectile Motion, Uniform Circular Motion.

- **UNIT 3: LAWS OF MOTION**

Force and inertia, Newton's First law of motion; Momentum, Newton's Second Law of motion, Impulses; Newton's Third Law of motion, Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces.

Static and Kinetic friction, laws of friction, rolling friction

Dynamics of uniform circular motion: centripetal force and its applications: vehicle on a level circular road, vehicle on a banked road.

- **UNIT 4: WORK, ENERGY AND POWER**

Work done by a constant force and a variable force; kinetic and potential energies, work-energy theorem, power.

The potential energy of spring conservation of mechanical energy, conservative and non-conservative forces; motion in a vertical circle: Elastic and inelastic collisions in one and two dimensions.

- **UNIT 5: ROTATIONAL MOTION**

Centre of the mass of a two-particle system, Centre of the mass of a rigid body: Basic concepts of rotational motion; moment of a force; torque, angular momentum, conservation of angular and its applications;

The moment of inertia, the radius of gyration, values of moments of inertia for simple geometrical objects, parallel and perpendicular axes theorems, and their applications.

Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.

- **UNIT 6: GRAVITATION**

The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Kepler's law of planetary motion. Gravitational potential energy; gravitational potential. Escape velocity, Motion of a satellite, orbital velocity, time period and energy of satellite.

- **UNIT 7: PROPERTIES OF SOLIDS AND LIQUIDS**

Elastic behaviour, Stress-strain relationship, Hooke's Law. Young's modulus, bulk modulus, modulus of rigidity. Pressure due to a fluid column; Pascal's law and its applications. Effect

of gravity on fluid pressure.

Viscosity. Stokes' law, terminal velocity, streamline, and turbulent flow critical velocity.

Bernoulli's principle and its applications.

Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension – drops, bubbles and capillary rise. Heat, temperature, thermal expansion; specific heat capacity, calorimetry; change of state, latent heat. Heat transfer conduction, convection and radiation.

- **UNIT 8: THERMODYNAMICS**

Thermal equilibrium, zeroth law of thermodynamics, the concept of temperature. Heat, work and internal energy. The first law of thermodynamics, isothermal and adiabatic processes.

The second law of thermodynamics: reversible and irreversible processes.

- **UNIT 9: KINETIC THEORY OF GASES**

Equation of state of a perfect gas, work done on compressing a gas, Kinetic theory of gases – assumptions, the concept of pressure. Kinetic interpretation of temperature; RMS speed of gas molecules; Degrees of freedom. Law of equipartition of energy and applications to specific heat capacities of gases; Mean free path. Avogadro's number.

- **UNIT 10: OSCILLATIONS AND WAVES**

Oscillations and periodic motion – time period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M) and its equations; phase: oscillations of a spring-restoring force and force constant: energy in S.H. M. – Kinetic and potential energies; Simple pendulum – derivation of expansion for its time period; Wave motion, Longitudinal and transverse waves, speed of travelling wave, Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves. Standing waves in strings and organ pipes, fundamental mode and harmonics. Beats.

## CHEMISTRY

### PHYSICAL CHEMISTRY

- **UNIT 1: SOME BASIC CONCEPTS IN CHEMISTRY**

Matter and its nature, Dalton's atomic theory: Concept of atom, molecule, element, and compound:: Laws of chemical combination: Atomic and molecular masses, mole concept, molar mass, percentage composition, empirical and molecular formulae: Chemical equations and stoichiometry.

- **UNIT 2: ATOMIC STRUCTURE**

Nature of electromagnetic radiation, photoelectric effect; Spectrum of the hydrogen atom. Bohr model of a hydrogen atom – its postulates, derivation of the relations for the energy of the electron and radii of the different orbits, limitations of Bohr's model; Dual nature of matter, de Broglie's relationship. Heisenberg uncertainty principle. Elementary ideas of quantum mechanics, quantum mechanics, the quantum mechanical model of the atom, its important features. Concept of atomic orbitals as one-electron wave functions: Variation of  $\psi$  and  $\psi^2$  with  $r$  for 1s and 2s orbitals; various Quantum numbers (principle, angular momentum, and magnetic quantum numbers) and

their significance; shapes of s, p, and d – orbitals, electron spin and spin quantum number: Rules for filling electrons in orbitals – Aufbau principle. Pauli's exclusion principle and Hund's rule, electronic configuration of elements, extra stability of half-filled and completely filled orbitals.

- **UNIT 3: CHEMICAL BONDING AND MOLECULAR STRUCTURE**

Kossel - Lewis approach to chemical bond formation, the concept of ionic and covalent bonds.

Ionic Bonding: Formation of ionic bonds, factors affecting the formation of ionic bonds; calculation of lattice enthalpy.

Covalent Bonding: concept of electronegativity. Fajan's rule, dipole moment: Valence Shell Electron Pair Repulsion (VSEPR) theory and shapes of simple molecules.

Quantum mechanical approach to covalent bonding: Valence bond theory - its important features. the concept of hybridization involving s, p, and d orbitals; Resonance.

**Molecular orbital Theory** - Its important features. LCAOs, 'types of molecular orbitals (bonding, antibonding), sigma and pi-bonds, molecular orbital electronic configurations of homonuclear diatomic molecules, the concept of bond order, bond length, and bond energy.

Elementary idea of metallic bonding. Hydrogen bonding and its applications.

- **UNIT 4: CHEMICAL THERMODYNAMICS**

Fundamentals of thermodynamics: System and surroundings, extensive and intensive properties, state functions, types of processes.

**The first law of thermodynamics** - Concept of work, heat internal energy and enthalpy, heat capacity, molar heat capacity; Hess's law of constant heat summation; Enthalpies of bond dissociation, combustion, formation, atomization. sublimation. phase transition, hydration, ionization, and solution.

**The second law of thermodynamics** - Spontaneity of processes:  $\Delta S$  of the universe and  $\Delta C$  of the system as criteria for spontaneity.  $\Delta G^\circ$  (Standard Gibbs energy change) and equilibrium constant.

- **UNIT 5: EQUILIBRIUM**

Meaning of equilibrium, the concept of dynamic equilibrium.

**Equilibria involving physical processes:** Solid-liquid, liquid - gas and solid-gas equilibria, Henry's law. General characteristics of equilibrium involving physical processes.

**Equilibrium involving chemical processes:** Law of chemical equilibrium, equilibrium constants ( $K_p$  and  $K_c$ ) and their significance, the significance of  $\Delta G$  and  $\Delta G^\circ$  in chemical equilibrium, factors affecting equilibrium concentration, pressure, temperature, the effect of catalyst; Le Chatelier's principle.

**Ionic equilibrium:** Weak and strong electrolytes, ionization of electrolytes, various concepts of acids and bases (Arrhenius. Bronsted – Lowry and Lewis) and their ionization, acid-base equilibria (including multistage ionization) and ionization constants, ionization of water. pH scale, common ion effect, hydrolysis of salts and pH of their solutions, the solubility of sparingly soluble salts and solubility products, buffer solutions.

- **UNIT 6: REDOX REACTIONS AND ELECTROCHEMISTRY**

Electronic concepts of oxidation and reduction, redox reactions, oxidation number, rules for assigning oxidation number, balancing of redox reactions

Electrolytic and metallic conduction, conductance in electrolytic solutions, molar conductivities and their variation with concentration: Kohlrausch's law and its applications.

Electrochemical cells – Electrolytic and Galvanic cells, different types of electrodes, electrode potentials including standard electrode potential, half-cell and cell reactions, emf of a Galvanic cell and its measurements: Nernst equation and its applications; Relationship between cell potential and Gibbs' energy change: Dry cell and lead accumulator; Fuel cells

**INORGANIC CHEMISTRY**

- **UNIT 7: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES**

Modern periodic law and present form of the periodic table, s, p, d and f block elements, periodic trends in properties of elements atomic and ionic radii, ionization enthalpy, electron gain enthalpy, valence, oxidation states, and chemical reactivity.

- **UNIT 8: P – BLOCK ELEMENTS**

**Group – 13 to Group 18 Elements**

**General Introduction:** Electronic configuration and general trends in physical and chemical properties of elements across the periods and down the groups; unique behaviour of the first element in each group.

- **UNIT 9: CO-ORDINATION COMPOUNDS**

Introduction to coordination compounds, Werner's theory; ligands, coordination number, denticity, chelation; IUPAC nomenclature of mononuclear coordination compounds, isomerism; Bonding – Valence bond approach and basic ideas of Crystal field theory, colour and magnetic properties; Importance of coordination compounds (in qualitative analysis, extraction of metals and in biological systems).

**ORGANIC CHEMISTRY**

- **UNIT 10: PURIFICATION AND CHARACTERISATION OF ORGANIC COMPOUNDS**

**Purification** – Crystallization, sublimation, distillation, differential extraction, and chromatography-principles and their application.

**Qualitative analysis** – Detection of nitrogen, sulphur, phosphorous, and halogens.

**Quantitative analysis** (basic principles only) – Estimation of carbon, hydrogen, nitrogen, halogens, sulphur, phosphorus

Calculation of empirical formulae and molecular formulae: Numerical problems in organic quantitative analysis.

- **UNIT 11: SOME BASIC PRINCIPLES OF ORGANIC CHEMISTRY**

Tetravalency of carbon: Shapes of simple molecules – hybridization (s and p): Classification of organic compounds based on functional groups: and those containing halogens, oxygens, nitrogen, and sulphur; Homologous series: Isomerism-structural and stereoisomerism.

**Nomenclature (Trivial and IUPAC)**

Covalent bond fission – Homolytic and heterolytic: free radicals, carbocations, and carbanions: stability of carbocations and free radicals, electrophiles and nucleophiles

### **Electronic displacement in a covalent bond**

- Inductive effect, electromeric effect, resonance, and hyperconjugation

**Common types of organic reactions** – Substitution, addition, elimination, and rearrangement.

- **UNIT 12: HYDROCARBONS**

Classification, isomerism, IUPAC nomenclature, general methods of preparation, properties and reactions.

**Alkanes** – Conformations: Sawhorse and Newman projections (of ethane): Mechanism of halogenation of alkanes.

**Alkenes** – Geometrical isomerism: Mechanism of electrophilic addition: addition of hydrogen, halogens, water, hydrogen halides (Markownikoffs and peroxide effect): Ozonolysis and polymerization

**Alkynes** – Acidic character: Addition of hydrogen, halogens, water, and hydrogen halides: Polymerization

**Aromatic hydrocarbons** – Nomenclature, benzene-structure and aromaticity: Mechanism of electrophilic substitution: halogenation, nitration

Friedel – Craft's alkylation and acylation, directive influence of the functional group in mono substituted benzene.

## **Biology**

- **UNIT 1: DIVERSITY IN LIVING WORLD**

-> What is living? ; Biodiversity; Need for classification;; Taxonomy & Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature;

-> Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids.

-> Salient features and classification of plants into major groups-Algae, Bryophytes, Pteridophytes, Gymnosperms (three to five salient and distinguishing features and at least two examples of each category);

-> Salient features and classification of animals-nonchordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples).

- **UNIT 2: STRUCTURAL ORGANISATION IN ANIMALS AND PLANTS**

-> Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence-cymose and racemose, flower, fruit and seed (To be dealt along with the relevant practical of the practical syllabus) Family (malvaceae, Cruciferae, leguminosae, compositae, gramineae).

-> Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (Frog). (Brief account only)

- **UNIT 3: CELL STRUCTURE AND FUNCTION**

-> Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic

cell; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles-structure and function; Endomembrane system-endooplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, micro bodies; Cytoskeleton, cilia, flagella, centrioles (ultra structure and function); Nucleus-nuclear membrane, chromatin, nucleolus.

-> Chemical constituents of living cells: Biomolecules-structure and function of proteins, carbohydrates. Lipids, nucleic acids; Enzymes-types, properties, enzyme action, classification and nomenclature of enzymes

-> B cell division: Cell cycle, mitosis, meiosis and their significance.

- **UNIT 4: PLANT PHYSIOLOGY**

-> Photosynthesis: Photosynthesis as a means of Autotrophic nutrition; Site of photosynthesis take place; pigments involved in Photosynthesis (Elementary idea); Photochemical and biosynthetic phases of photosynthesis; Cyclic and non cyclic and photophosphorylation; Chemiosmotic hypothesis; Photorespiration C3 and C4 pathways; Factors affecting photosynthesis.

-> Respiration: Exchange gases; Cellular respiration-glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); Energy relations-Number of ATP molecules generated; Amphibolic pathways; Respiratory quotient.

-> Plant growth and development: Seed germination; Phases of plant growth and plant growth rate; conditions of growth; Differentiation, dedifferentiation and redifferentiation; Sequence of development process in a plant cell; Growth regulators-auxin, gibberellin, cytokinin, ethylene, ABA;

- **UNIT 5: HUMAN PHYSIOLOGY**

-> Breathing and Respiration: Respiratory organs in animals (recall only); Respiratory system in humans; Mechanism of breathing and its regulation in humans-Exchange of gases, transport of gases and regulation of respiration Respiratory volumes; Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.

-> Body fluids and circulation: composition of blood, blood groups, coagulation of blood; Composition of lymph and its function; Human circulatory system-Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG, Double circulation; Regulation of cardiac activity; Disorders of circulatory system-Hypertension, Coronary artery disease, Angina pectoris, Heart failure.

-> Excretory products and their elimination: Modes of excretion-Ammonotelism, ureotelism, uricotelism, Human excretory system-structure and function; Urine formation, Osmoregulation; Regulation of kidney function-Renin-angiotensin, Atrial Natriuretic Factor, ADH and Diabetes insipidus; Role of other organs in excretion; Disorders; Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney.

-> Locomotion and Movement: Types of movement-ciliary, flagellar, muscular; Skeletal muscle-contractile proteins and muscle contraction; Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus); Joints; Disorders of muscular and skeletal system-Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.

-> Neural control and coordination: Neuron and nerves; Nervous system in

humansentral nervous system, peripheral nervous system and visceral nervous system; Generation and conduction of nerve impulse;  
-> Chemical coordination and regulation: Endocrine glands and hormones; Human endocrine system-Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancrease, Gonade; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulator, Hypo-and hyperanctivity and related disorders (Common disorders e.g. Dwarfish, Acromegaly, Cretinism, goiter, exophthalmic goiter, diabeters, Addison's disease).

*(Imp: Diseases and disorders mentioned above to be dealt in brief).*

## **MATHEMATICS**

### **UNIT 1: SETS, RELATIONS, AND FUNCTIONS:**

Sets and their representation: Union, intersection, and complement of sets and their algebraic properties; Power set; Relation, Type of relations, equivalence relations, functions; one-one, into and onto functions, the composition of functions.

### **UNIT 2: COMPLEX NUMBERS AND QUADRATIC EQUATIONS:**

Complex numbers as ordered pairs of reals, Representation of complex numbers in the form  $a + ib$  and their representation in a plane, Argand diagram, algebra of complex number, modulus, and argument (or amplitude) of a complex number, Quadratic equations in real and complex number system and their solutions Relations between roots and co-efficient, nature of roots, the formation of quadratic equations with given roots.

### **UNIT 4: PERMUTATIONS AND COMBINATIONS:**

The fundamental principle of counting, permutation as an arrangement and combination as section, Meaning of  $P(n,r)$  and  $C(n,r)$ , simple applications.

### **UNIT 5: BINOMIAL THEOREM AND ITS SIMPLE APPLICATIONS:**

Binomial theorem for a positive integral index, general term and middle term, and simple applications.

### **UNIT 6: SEQUENCE AND SERIES:**

Arithmetic and Geometric progressions, insertion of arithmetic, geometric means between two given numbers, Relation between A.M and G.M.

### **UNIT 7: LIMIT, CONTINUITY, AND DIFFERENTIABILITY:**

Real-valued functions, algebra of functions, polynomials, rational, trigonometric, logarithmic, and exponential functions, inverse function. Graphs of simple functions. Limits, continuity, and differentiability. Differentiation of the sum, difference,



product, and quotient of two functions. Differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite, and implicit functions; derivatives of order up to two, Applications of derivatives: Rate of change of quantities, monotonic-Increasing and decreasing functions, Maxima and minima of functions of one variable.

## **UNIT 8: CO-ORDINATE GEOMETRY**

Cartesian system of rectangular coordinates in a plane, distance formula, sections formula, locus, and its equation, the slope of a line, parallel and perpendicular lines, intercepts of a line on the co-ordinate axis.

### **Straight line**

Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, the distance of a point from a line, co-ordinate of the centroid, orthocentre, and circumcentre of a triangle,

### **Circle, conic sections**

A standard form of equations of a circle, the general form of the equation of a circle, its radius and central, equation of a circle when the endpoints of a diameter are given, points of intersection of a line and a circle with the centre at the origin and sections of conics, equations of conic sections (parabola, ellipse, and hyperbola) in standard forms,

## **UNIT 9: THREE DIMENSIONAL GEOMETRY**

Coordinates of a point in space, the distance between two points, section formula, directions ratios, and direction cosines, and the angle between two intersecting lines. Skew lines, the shortest distance between them, and its equation. Equations of a line

## **UNIT 10: STATISTICS AND PROBABILITY**

Measures of discretion; calculation of mean, median, mode of grouped and ungrouped data calculation of standard deviation, variance, and mean deviation for grouped and ungrouped data.

Probability: Probability of an event, addition and multiplication theorems of probability, Baye's theorem, probability distribution of a random variate,

## **UNIT 11: TRIGONOMETRY**

Trigonometrical identities and trigonometrical functions, inverse trigonometrical functions, and their properties,

- x. This is the class schedule, which is designed for this particular session.

**Class Schedule for foundation batch GVM-A (24-26), Morning**

|           | 08:30-09:30         | 09:45-11:15 | 11:30-01:00 |
|-----------|---------------------|-------------|-------------|
| Monday    | Mathematics/Biology | Chemistry   | Physics     |
| Tuesday   | Mathematics/Biology | Chemistry   | Physics     |
| Wednesday | Mathematics/Biology | Chemistry   | Physics     |
| Thursday  | Mathematics/Biology | Chemistry   | Physics     |
| Friday    | Mathematics/Biology | Chemistry   | Physics     |

- \* Class Schedule can be updated according to availability of Teacher's schedule and syllabus
- \* Test conduction on every fortnight on completion of chapter in each subject.

- xi. **Prescribed Books and Author for this curriculum,**

Although, NCERT books and GVM's study material are quite sufficient to achieve the target. But for sake of overall comprehensive understanding and knowledge, GVM prescribed some books.

**Physics**

- (i) NCERT – Books
- (ii) M. Karim
- (iii) D.C. Pandey
- (iv) H.C Verma
- (v) Cengage – B.M. Sharma
- (vi) Resnick Halliday (Fundamentals of Physics)
- (vii) University Physics

**Chemistry**

- (i) NCERT
- (ii) NCERT – Exemplar
- (iii) Physical Chemistry – N Awasthi
- (iv) Physical Chemistry – R. Mukher Ji
- (v) Inorganic Chemistry – O.P. Tandon
- (vi) Cengage Books for Chemistry
- (vii) Organic Chemistry – MS Chauhan

**Mathematics**

- (i) NCERT
- (ii) R.S. Agrawal

- (iii) R.D. Sharma
- (iv) Arihant
- (v) S.A. Lony (Coordinate & Trigonometry)
- (vi) Hall & Knight (Algebra)

**Biology**

- (i) NCERT
- (ii) MTG Fingertips
- (iii) Trueman Elementary – K.N. Bhatia
- (iv) ISC Biology – Sarita Agrawal
- (v) Nootan ISC Biology – Prof. V. Singh
- (vi) Cenge – Dr. Dileep Gangwar
- (vii) Human Physiology – Ross & Wilson
- (viii) Biotechnology – RC Pandey
- (ix) Cell Biology – S.C. Rastogi.
- (x) ISC Biology – Veer Bala Rastogi