



Class 9 Academic program - 2025

Course Description

SI	Subject	Number of Class	Number of Exam
01	Physics	62	<ul style="list-style-type: none"> Daily exam -282 Chapter wise exam - 57 Subject final exam - 6
02	Chemistry	46	
03	Mathematics	60	
04	Higher Mathematics	56	
05	Biology	48	
06	Information and Communication Technology	10	
Total Lecture		282	

All the Chapters that will be taught in 9th class

SI no.	Subject	Chapter
01	Physics	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
02	Chemistry	1, 2, 3, 4, 5, 6, 7, 8, 9
03	Mathematics	1, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 5.1, 5.2, 6, 7, 8.1, 8.2, 8.3, 9.1, 9.2, 11.1, 11.2, 13.1, 16.1, 16.2, 17
04	Higher Mathematics	1.1, 1.2, 2, 3.1, 3.2, 4, 5.1, 5.2, 5.3, 5.4, 5.5, 8.1, 8.2, 9.1, 9.2, 11.1, 11.2, 13, 14
05	Biology	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
06	Information and Communication Technology	1, 2, 3, 4

Physics

Chapter	Lecture	Topics
Chapter-01 (Physical Quantities and Their Measurements)	P-01	Physics, Scope of Physics, Development of Physics, Initial Stage, Rising Stage of Science, Introduction to Modern Physics, Contemporary Physics, Contributions of Jagadish Chandra Bose, Objectives of Physics, Unfold the Mystery of Nature, To Know the Laws of Nature, Development of Technology Using the Laws of Nature,
	P-02	Physical Quantities and Their Measurements, Units of Measurements, Prefix, Dimension, Scientific Symbols and Notations Measuring Instruments, Scale or Ruler, Balance, Stop Watch, Vernier Calipers, Screw Gauge, Error and Accuracy.
Chapter-02 (Motion)	P-03	Rest and Motion, Different Types of Motion (Linear Motion, Circular Motion, Translational Motion, Periodic Motion, Simple Harmonic Motion)
	P-04	Scalars and Vectors Quantities, Distance and Displacement
	P-05	Speed and Velocity, Acceleration and Deceleration or Retardation
	P-06	Equations of Motion



Chapter	Lecture	Topics
	P-07	Laws of Falling Bodies
	P-08	Graph related problem
	P-09	Mathematical problems
	P-10	Mathematical problems
Chapter-03 (Force)	P-11	Inertia and Concept of Force: Newton's First Law, Inertia, Force
	P-12	Nature of Fundamental Force, Gravitational Force, Electromagnetic Force, Weak Nuclear Force or Weak force, Strong Nuclear Force, Balanced and Unbalanced Forces, Momentum
	P-13	Effect of Force on Motion: Newton's Second Law
	P-14	Gravitational Force & Mathematical problems.
	P-15	Newton's Third Law
	P-16	Collision, Conservation of Momentum and Energy, Safe Journey: Velocity and Motion.
	P-17	Frictional Force, Types of Friction (Static Friction, Kinetic Friction, Rolling Friction), Effects of Friction on Motion (Tyre's Surface, Smoothness off road, Controlling Motion and Breaking Force), Increase and Decrease of Friction, Friction: An essential hazard.
	P-18	Mathematical problems
Chapter-04 (Work, Power and Energy)	P-19	Work, Energy
	P-20	Different forms of energy, Kinetic Energy, Potential Energy
	P-21	Sources of Energy, Non-Renewable Energy (Fuel Energy, Nuclear Energy), Renewable Energy (Hydroelectricity, Biomass, Solar energy, Wind energy, Bio fuel, Geothermal energy), Transformation of energy and impact on environment, Conservation and Transformation of Energy, Conservation of energy, Transformation of Energy (Electrical energy, Chemical energy, Heat energy, Mechanical energy, Light energy, Mass)
	P-22	Relation between mass and energy, Power
	P-23	Efficiency
	P-24	Mathematical problems
Chapter-05 (State of Matter and Pressure)	P-25	Pressure, Density, Uses of Density in our Daily Life.
	P-26	Pressure in Liquid, Archimedes Law and Buoyancy.
	P-27	Flotation and Immersion of a Body.
	P-28	Pascal's Law.
	P-29	Pressure of air, Torricelli's experiment, Pressure of air and weather.
	P-30	Three States of Matter: Solid, Liquid and Gas, Molecular Kinetic Theory of Matter, Fourth state of Substance.
	P-31	Elasticity
	P-32	Mathematical Problems.
Chapter-06 (Effect of Heat on Matter)	P-33	Heat and Temperature, Internal Energy
	P-34	Thermometric Properties of Matter, Relation among different scales and Mathematical Problems.
	P-35	Thermal Expansion of Matter, Expansion of Solids, Expansion of Liquid, Expansion of Gases,
	P-36	Effect of Temperature on Change of State, Dependence of Vaporization(Flow of air the area of the exposed surface of the liquid, nature of liquid, pressure of air).



Chapter	Lecture	Topics
	P-37	Specific Heat, Fundamental principle of Calorimetry, Effect of pressure on Melting Point and boiling Point
	P-38	Specific Heat, Fundamental principle of Calorimetry, Mathematical Problems.
Chapter-07 (Waves and Sound)	P-39	Simple Harmonic Motion
	P-40	Waves, Characteristics of Waves, Types of Waves,
	P-41	Wave related quantities, Sound Wave, Characteristics of sound wave, Echo,
	P-42	Variation of Velocity of Sound, Mathematical problem
	P-43	Uses of Sound (Three dimensional Seismic Surveys, Ultrasound cleaner).
	P-44	Musical Sound, Sound Pollution.
Chapter-08 (Reflection of Light)	P-45	Nature of Light, Reflection, Absorption.
	P-46	Laws of Reflection, Reflection from smooth and rough planes.
	P-47	Mirror, Image, Spherical Mirror.
	P-48	Convex Mirror, Image in a Spherical Convex Mirror.
	P-49	Concave Mirror, Image on concave mirror (At a distance less than focal length, At a distance greater than focal Length)
	P-50	Magnification, Use of Mirrors, Plane Mirror, Convex Mirror, Concave Mirror, Safe Driving Invisible Curves of Hilly Roads
Chapter-09 (Refraction of Light)	P-51	Refraction of Light, Laws of Refraction.
	P-52	Relative Refractive Index, Mathematical Problems.
	P-53	Total Internal Reflection, Rainbow, Mirage, Mathematical Problems.
	P-54	Uses of Reflection, Optical Fiber, Prism, Periscope and Binocular, Lens.
	P-55	Types of Lenses, Concave Lens.
	P-56	Convex lens, Power of lens.
Chapter-10 (Static Electricity)	P-57	Charge, Static Electricity by Friction
	P-58	Electrical Induction, Electroscope
	P-59	Electric Force
	P-60	Electric Field
	P-61	Electric Potential, Potential Difference, Capacitor
	P-62	Uses of Static Electricity, Photocopy, Van de Graaff Machine, Fuel Truck, Electronics, Lightning and Lightning Arrestor, Static Electric Color Spray

Chemistry

Chapter	Lecture	Topics
Chapter-1 (Concepts of Chemistry)	C-01	Introduction to chemistry, the scopes of chemistry, Relationship between chemistry & other branches of science, the importance of studying chemistry.
	C-02	The process of research in chemistry, Steps in research in chemistry, Safety measures in chemistry laboratory and in use of chemicals.
Chapter-2 (States of Matter)	C-03	Matter & States of matter, *Intermolecular Force & energy, atomic mass (chart) + molecular mass.
	C-04	Kinetic theory of particles & *postulates of kinetic theory, Diffusion, Effusion.
	C-05	Burning of a candle & the three states of wax, Melting & Boiling, Distillation & Sublimation, Graph of applying heat & mathematical explanation.



Chapter	Lecture	Topics
	C-06	Heating & cooling curve due to application of heat, Sublimation curve, Diffusion, Effusion (Revision).
Chapter-3 (Structure of Matter)	C-07	Elements and Compounds, Atoms and Molecules, Symbols of Elements, Formula, The fundamental particles of an atom, Atomic Number, Mass Number.
	C-08	Atomic Model, Rutherford's Atomic Model, Limitations of Rutherford's Model.
	C-09	Bohr's Atomic Model, Success and Limitations of Bohr's Model.
	C-10	Orbital Electronic Configuration of Atoms, Concept of Energy Sublevel, The Principles of Electronic Configuration in Atoms, Example.
	C-11	The Principles of Electronic Configuration in Atoms (Revision), Some Exceptions in Electronic Configuration.
	C-12	Isotopes, Atomic Mass or Relative Atomic Mass, Determining the Average Relative Mass of an Element from Percentage of Isotope, Getting the Relative Molecular Mass from Relative Atomic Mass, Radioactive Isotopes and Their Uses, Medical Science, Agriculture Sector, Generation of Electricity, Impact of Radioactive Isotope.
Chapter-4 (Periodic Table)	C-13	Background of Periodic Table, Characteristics of the Periodic Table.
	C-14	Determination of the Position of Elements in the Periodic Table from their Electronic Configuration, Electronic Configurations of Elements are the Main Basis of the Periodic Table Some Exceptions in the Periodic Table.
	C-15	Periodic Properties of Elements (Metallic and Non-metallic Properties, Atomic Radius/Size of atom, Ionization Energy, Electron Affinities, Electronegativity).
	C-16	The Special Names of Elements Present in Various Groups (Alkali Metals, Alkaline Earth Metals, Coin Metals, Halogen Group, Inert Gas, Transition Elements), Advantages of the Periodic Table, Element in the Same Group in the Periodic Table Show similar Chemical Properties, Lime Water Test.
Chapter-05 (Chemical Bond-Partial)	C-17	Valence Electrons, Valency, Radicals and Their Valencies, Chemical Formula of Compounds,
	C-18	Molecular Formula and Structural Formula, Octet and Duet Rules,
	C-19	Inert Gases and their Stability, Chemical Bonds and the Causes of their Formation, Cations and Anions
	C-20	Ionic Bond or Electrovalent Bond, Covalent Bonds, Revision
	C-21	Characteristics of Ionic and Covalent Bonds (Melting Point and Boiling Point, Solubility, Electrical Conductivity)
	C-22	Metallic bonds, Identifying bonds in the compounds.
Chapter-06 (Concept of Mole and Chemical Counting)	C-23	Mole, Avogadro's number, Molar Volume of Gas, Mole and Molecular Formula
	C-24	Molar Solution & Molarity, Mathematical problems
	C-25	The Percentage Composition of Elements in Compounds, Percent Composition and Empirical Formula
	C-26	Determining the Molecular Formula of a Compound from Percent Composition
	C-27	Chemical Reactions and Chemical Equations, Balancing Chemical Equations.
	C-28	Mole and Chemical Equation, Calculation of the Percentage of Yield, Limiting Reactant.
Chapter-07	C-29	Changes of Matter, Physical Change, Chemical Change, Classification of Chemical Reactions (Direction of Reaction, Heat Change and Reactions).



Chapter	Lecture	Topics
(Chemical Reactions)	C-30	Chemical Change, Classification of Chemical Reactions (Oxidation, Reduction, Electron Transfer, Redox Reactions)
	C-31	Oxidation Number and Determining Oxidation Number, Oxidation-reduction is a simultaneous process.
	C-32	Reactions that occur through electron transfer (Addition, Decomposition, Substitution or Displacement and Combustion Reaction)
	C-33	Non Redox Reaction (Precipitation and Neutralization Reaction), Special Types of Chemical Reactions (Hydrolysis and Hydration Reaction),
	C-34	Special Types of Chemical Reactions, Isomerization and Polymerization,
	C-35	Example of a Few Real-Life Chemical Reactions, Ways of Prevention of Some Harmful Reactions, Rate of Reaction.
	C-36	Le Chatelier's Principle, Explanation of Le Chatelier's Principle and Effect,
Chapter-8 (Chemistry & Energy)	C-37	Source of chemical energy, Classification of chemical reactions according to change of heat, (Exothermic and Endothermic), Calculation of heat change in chemical reactions using the bond energy.
	C-38	Mathematical problem related to heat change in chemical reactions, Transformation of chemical energy into different types of energy, Chemical energy and use of various energies obtained from chemical energy.
	C-39	Appropriate use of chemical energy, Importance of purity of fuel, Negative effects of the use of chemical energy, uses of ethanol as fuel.
	C-40	Electrochemical cells, conductors, electronic conductors, Electrolyte & Electrode, Electrolytic cell, Electrolysis, Uses of electrolysis.
	C-41	Mechanism of electrolysis.
	C-42	Production of electricity by chemical reactions, nuclear reaction & electricity generation.
Chapter-9 (Acid- Base Balance)	C-43	Acid, Demonstrating properties of dilute acids through experiments, The role of water in chemical properties of acids, Alkali & Base, Properties of dilute bases.
	C-44	Dilute base in reaction with metallic salts, The role of water in chemical properties of Alkali, Corrosive properties of concentrated acids and alkali.
	C-45	Revision, the conception of pH, Measuring pH, Importance of pH, Neutralization Reaction (Importance of Neutralization Reaction in daily life, Salt), Acid rain.
	C-46	Hardness of water, Water pollution & pollution control, Testing the purity of water and water purification, BOD, COD, Concept of Molarity.

Mathematics

Chapter	Lecture	Topics
Chapter-01 (Real Numbers)	M-01	Classification of Real Numbers, Proof of Irrational Numbers, Decimal Fractions, Exercise-1 (9, 10, 20).
	M-02	Repeating Decimals, Conversion into Common Fractions, Addition and Subtraction of repeated Decimal Fractions, Exercise-1 (12-16).
	M-03	Multiplication, division of repeating decimal fractions, Exercise-1 (17, 18, 23).
	M-04	Square Roots, Infinite Decimal Fractions, Exercise-1 (11, 19, 21, 22).



Chapter	Lecture	Topics
Chapter-02 (Sets and Functions)	M-05	Set, Methods for expressing sets, All definitions and examples (Finite Set, Infinite Set, Empty Set, Subset, Proper Subset, Equivalent Set, Difference of Sets, Power Set, Universal Set, Complement of a Set, Union of Sets, Intersection of Sets, Disjoint Set), Exercises- 2.1 (1-6)
	M-06	Ordered Pair, Cartesian Product, Venn diagram, Exercises- 2.1 (7-12)
	M-07	Relation, Function, Example
	M-08	Exercises- 2.2
Chapter-03 (Algebraic Expression)	M-09	Algebraic Expressions, Algebraic Formulae, Examples of 3.1, Exercises – 3.1 (1, 2).
	M-10	Exercise 3.1 (3-15).
	M-11	Formula of Cubes, Corollary, Works, Exercises - 3.2 (1, 2).
	M-12	Exercise – 3.2 (3-15).
	M-13	Reducing Fractions, Fractions with Common Denominators, resolving into factors, Techniques for determining factors, work, Exercise-3.3 (1-15)
	M-14	Exercise-3.3 (16-25).
	M-15	Exercise-3.3 (26-31), concept of remainder theorem, concept of factorization theorem, example, Work, Addition and subtraction of algebraic fractions and equation.
	M-16	Exercise-3.4 (1-16).
Chapter-04 (Exponents and Logarithms)	M-17	Exponents, Laws of of Exponents, Proofs and Examples, Exercise-4.1 (1-8).
	M-18	Exercise 4.1 (9-22), Basic concepts of Logarithms.
	M-19	Proof of Laws of Logarithms, Exercise – 4.2
	M-20	Method of Logarithms (Normal Logarithm, Common Logarithm) Concepts of characteristics and mantissa of common logs, Exercise 4.3, Example.
Chapter-05 (Equations in One Variable)	M-21	Variable, Equation and Identity, Solving Linear Equations, Exercise- 5.1 (1-14) Exercise- 5.2 (1-22).
	M-22	Exercise-5.1 (15-22, 25).
	M-23	Quadratic Equations in One Variable, Usage of Quadratic Equations, Exercise-5.2 (23-31).
	M-24	Exercise – 5.1 (23, 24), Exercise – 5.2 (32, 33, 34).
Chapter-06 (Lines, Angles and Triangles)	M-25	Appended Theorems (Statements of 1, 2, 3, 4, 5), Concept of space, surface, plane, line and point, Exercise-6.1, Line, Ray, Line Segment, Angle etc. Theorems- (1-4), Exercise- 6.2
	M-26	Theorem- (5-16), Exercise- (1-11) of 6.3
	M-27	Exercise 6.3 of (12-17).
	M-28	Exercise 6.3 of (18-23).
Chapter-07 (Practical Geometry)	M-29	Construction (1, 2, 3) Exercise-7.1 (1, 2).
	M-30	Exercise – 7.1 (3-7).
	M-31	Construction (4, 5), Examples (3, 4), Exercises- 7.2 (1-10).
	M-32	Exercise 7.2 (11-19).
Chapter-08 (Circle)	M-33	Circle, interior and exterior of a circle, chord and diameter, Theorems (17, 18, 19), Exercise-8.1 (1-2).
	M-34	Exercise- 8.1 (3-8).
	M-35	Arc of a Circle, Inscribed angle, Central angle, Theorem- 20, 21, 22



Chapter	Lecture	Topics
	M-36	Exercise – 8.2
	M-37	Theorem related to quadrilateral inscribed in a circle (23, 24), Exercise-8.3 (1, 2).
	M-38	Exercise – 8.3 (3-7).
Chapter-09 (Trigonometric Ratio)	M-39	Naming of sides of right-angled triangles, Constancy of ratios of sides of similar right angled triangles, Trigonometric ratios of acute angles, Relationship among trigonometric ratios, Trigonometric identity.
	M-40	Examples (1-12), Work, Exercises - 9.1 (1-7, 19, 20).
	M-41	Exercise 9.1 (8-16).
	M-42	Exercise 9.1 (17, 18, 21-25).
	M-43	Proof of Trigonometric Ratios of Angles $0^\circ, 30^\circ, 60^\circ, 45^\circ, 90^\circ$, Example (13) Exercise 9.2 (1-17, 22, 27).
	M-44	Example (14), Exercise-9.2 (18-21, 23-26, 28-32).
Chapter-11 (Algebraic Ratio and Proportion)	M-45	Ratio and Proportion, Continued Proportion, Transformation of Proportions, Example (2), Exercise-11.1 (6).
	M-46	Exercise-11.1 (1-5), Example (11), Exercise-11.1 (9, 10).
	M-47	Examples (3-8), (7, 8) of Exercise 11.1
	M-48	Example (9, 10), (11-20) of Exercise 11.1
	M-49	Continued Proportions, Ratio, Exercise-11.2 (1-14).
	M-50	Exercise-11.2 (15-25).
Chapter-13 (Finite series)	M-51	Sequences, Series, Arithmetic series, Determination of general term of arithmetic series, Sum of n terms of arithmetic series, Examples (1-6), Exercise- 13.1(1-7, 9-18).
	M-52	Exercise 13.1(8, 19-24).
Chapter-16 (Mensuration)	M-53	Proof of Area of different types of triangular region, Exercise 16.1 (1, 2, 3, 4, 6).
	M-54	Exercise 16.1 (5, 7-10), Proof of Area of Regular Polygons.
	M-55	Proving Areas of Different Types of Quadrilaterals, Exercise 16.2 (1-8).
	M-56	Exercise – 16.2(9-16).
Chapter-17 (Statistics)	M-57	Cumulative frequency, frequency distribution table, Mass Polygons, Ogive curve.
	M-58	Determination of mean, Determination of arithmetic mean in short cut method.
	M-59	Concept of median, Examples, Exercises- 17.
	M-60	Concept of mode, Examples, Exercises – 17.

Higher Mathematics

Chapter	Lecture	Topics
Chapter-01 (Set and Function)	HM-01	Sets, Different Types of Sets (Universal Set, Subsets, Empty Set, Equality of Sets, Proper subset, Difference of set, Complementary set, Power set), Union of sets, Proposition-9, Exercise 1.1 (7, 8, 9, 14, 15).
	HM-02	Venn Diagram, Exercise 1.1 (16-25, 27).
	HM-03	Disjoint set, De Morgan's Law(Proposition-1), Cartesian Product Set, One-One Correspondence, Equivalent Set, Finite and infinite sets. Exercises- 1.1 (10, 11, 12,13)



Chapter	Lecture	Topics
	HM-04	Proposition-3, Practice-1.1 (26, 28, 29, 30).
	HM-05	Relations, functions (difference between relations and functions), Ordered Pairs, Domain, Range, Concepts of Co-domain, solving problems related to Ordered Pairs, Exercise-1.2 (1-4, 6-9).
	HM-06	Concept of One- One Functions, Concept of Onto Functions, Inverse Functions, Exercises- 1.2 (5, 10, 11, 12).
	HM-07	Quadratic Functions, Graphs of Relations and Functions, Graphs of Circles, Exercise-1.2 (13, 14).
	HM-08	Exercise-1.2 (15, 16, 17), Activity.
Chapter-02 (Algebraic Expression)	HM-09	Variables, Constant, Polynomials, Polynomials of One, Two and Three Variables, Cyclic, Symmetric and Homogenous Expressions, Activity on Page-40, Exercise-2 (1, 2), Example-22, Exercise-2 (d of 10).
	HM-10	Work (a) on Page-57, Work on Page-55, Exercise-2 (1,2,3 of 10).
	HM-11	Multiplication and Division of polynomial, Quotient and Product Theorem, Converse of factor theorem, Activity on Page-51-52, Exercise-2 (3-7), HW: Exercise-2 (15)
	HM-12	Page-52 Proposition-1, Activity on Page-56 (2, 3), Example-18, Exercise-2 (8, 9, 12,13)
	HM-13	Partial fractions, examples (23-29), Activity.
	HM-14	Exercise-2 (11, 14).
Chapter-03 (Geometry)	HM-15	Projection of a point, Orthogonal projection, Theorem- 1, 2, 3, 4
	HM-16	Exercise – 3.1 (1, 2, 3, 4, 6).
	HM-17	All Theorems of Apollonius, Theorem-5, Relationship between Side-Median, Exercise-3.1 (5, 7).
	HM-18	Orthocenter, Circumcenter, Centroid, Nine Point Circle, Theorem- 6, 10, Exercise- 3.2 (8, 9), HW- 3.2 (16).
	HM-19	Theorem- 7, 8, 9, 11, 12
	HM-20	Exercise-3.2 (7, 10-14), HW-3.2 (15)
Chapter-4 (Geometric Constructions)	HM-21	Construction-(1, 2, 3, 4, 5, 6), Example-1, 2, 3
	HM-22	Exercise-4 (12, 13, 14), Exercise-4 (1-6).
	HM-23	Exercise-4 (7-11).
	HM-24	Exercise-4 (15-18).
Chapter-05 (Equation)	HM-25	(Quadratic equations of one variable and their solutions), Exercise-5.1
	HM-26	(Equations with radicals, example), Exercise-5.2
	HM-27	Indicial equations, examples (12-18), work.
	HM-28	Exercise-5.3
	HM-29	(System of Quadratic Equations in Two Variables, Example), Exercise-5.4
	HM-30	(Applications of Quadratic Equations, Example), Exercise-5.5
Chapter-08 (Trigonometry)	HM-31	Angles in Geometry and Trigonometry, Positive and Negative Angles, Units of Angle Measurement, Circular System of Measurement of Angles, Radian Angles, Relationship between Degree and Radian measure, Exercise- 8.1 (1, 2, 5, 6).
	HM-32	Exercise – 8.1 (3, 4, 7-13).



Chapter	Lecture	Topics
	HM-33	Trigonometric Ratios, Signs of Trigonometric Ratios in Different Quadrants, Exercise-8.2 (1-6).
	HM-34	Exercise-8.2 (7-13), Example, Exercise-8.3 (10, 12).
Chapter-09 (Exponential and Logarithmic Function)	HM-35	Rational and Irrational Exponents, Laws for Exponents, Explanation of Roots (Proof of Formula (7)), Rational Fractional Exponents, Corollary, Exercise-9.1 Examples (9-12).
	HM-36	Exercise 9.1 Examples (13,14,15), Activity.
	HM-37	Exercise-9.1 (1-6, 8).
	HM-38	Example (16, 17), Exercise-9.1 (7, 9).
	HM-39	Examples (18-29), Activity on page 223.
	HM-40	Exercise-9.2 (1, 2, 3, 4, 5 of 7, 6).
	HM-41	Exercise-9.2 (6,7,8, of 7), Examples (31, 33), Exercise-9.2 (10, 11, 12).
	HM-42	Logarithmic and Absolute Value Functions, Graph of Functions, Exercise-9.2 (8, 9, 13, 14, 15).
Chapter-11 (Coordinate Geometry)	HM-43	Rectangular Cartesian Coordinates, Distance Between Two Points, Example, Exercise – 11.1
	HM-44	Area of a Triangle, Formula for Finding the Area of a Triangle, Example (7-11), Exercise-11.2 (1-7).
	HM-45	Vertices, finding area using coordinates, Exercise – 11.2 (8, 9).
	HM-46	Exercises – 11.2 (10), Examples (12, 13).
Chapter-13 (Solid geometry)	HM-47	Some basic definitions, solids, volume and surface area of rectangular solids, cube, Exercise-13 (7-9), HW: Exercise-13 (31)
	HM-48	Exercise-13 (10, 21-23), Right circular cone, Exercise-13 (11-13, 24), HW: Exercise-13 (32).
	HM-49	Sphere, Exercise-13 (14-20).
	HM-50	Prism, pyramid, example.
	HM-51	Exercise-13 (25-28).
	HM-52	Rectangular Solids, Exercise-13 (1-6 and 29, 30).
Chapter-14 (Probability)	HM-53	Some Concepts related to Probability, Logic Based Probability, Data Based Probability, Examples, Activity, Exercise-14 (1-6).
	HM-54	Exercise-14 (7-12), Sample Space and Probability Determination of Probability-by-Probability Tree, Exercise-14 (13, 14).
	HM-55	Mutually Exclusive Events, Mutually Non-Exclusive Events, Concept of Exclusive Events (When to Multiply / Add), Exercise-14 (15-18).
	HM-56	Chapter review and creative Problems related to Probabilities.



Biology

Chapter	Lecture	Contents
Chapter-01 (Lessons of Life)	B-01	Concept of biology, Branches of biology, Physical biology, applied biology, Classification of living beings, aim of classification, Living world (Margulis + R.H. Whittaker's classification- Monera, Protista).
	B-02	Living world (Margulis + R.H. Whittaker's classification- Fungi, Plantae, Animalia), Different steps of classification, System of Binomial Nomenclature, Binomial names.
Chapter-02 (Cells and Tissues of Organisms)	B-03	Living cell, Types of cells, Plant cell and animal cell (With figure), Difference between plant cell and animal cell, Main organelles of plant and animal cells and their functions (Cell wall).
	B-04	Main organelles of plant and animal cells and their functions (Cell wall) (Protoplasm, Plasmalemma, Cytoplasmic organelles, Mitochondria).
	B-05	Plastid, Chloroplast, Chromoplast, Leucoplast, Golgi body, Endoplasmic reticulum, Cell vacuole, Lysosome.
	B-06	Non-membranous cytoplasmic organelles, Nucleus.
	B-07	Roles of different cells in proper functioning of plants and animals, Plant tissue (Simple tissue, Complex tissue, Xylem, Phloem).
	B-08	Plant tissue (Epithelial tissue)
	B-09	Animal tissues (Connective tissue and its classification), Muscular tissue, Nerve tissue.
	B-10	Organ and system, Microscope, Electron microscope, Differentiations.
Chapter-03 (Cell Division)	B-11	Cell division and its classification, Mitosis, Stages of mitosis.
	B-12	Significance of mitosis, Meiosis, Significance of meiosis, Difference between mitosis and meiosis, Discussion about haploid and diploid cells.
Chapter-04 (Bioenergetics)	B-13	Bioenergetics, Structure and function of ATP, Photosynthesis, The process of photosynthesis (Light dependent phase and light independent phase).
	B-14	Calvin cycle, Hatch and Slack pathway, Role of Chlorophyll in photosynthesis, Role of light in photosynthesis, Factors affecting photosynthesis, Importance of photosynthesis in living world.
	B-15	Respiration, Types of respiration, respiratory factors (Aerobic respiration).
	B-16	Respiratory factors (anaerobic respiration). Factors affecting respiration, Significance of respiration.
Chapter-05 (Food, Nutrition and Digestion)	B-17	Plant mineral nutrition, Source and role of nutrients, Symptoms of nutrient deficiencies.
	B-18	Food and nutrition of animal, Components of food and their sources (Protein, Carbohydrate, Fat and oils, Vitamins).
	B-19	Components of food and their sources (Minerals, water and their source), An ideal food pyramid, Principles of food habit.
	B-20	Vitamin deficiency diseases, Energy in food ingredients and determine Heat Energy.
	B-21	BMR and BMI, Exercise and rest, Use of chemicals in food preservation.
	B-22	Digestion, Alimentary system or alimentary canal, Digestive glands, Functions of liver.
	B-23	Pancreas, Gastric glands, Intestinal glands etc., Digestion of food, Absorption of digested Food, Assimilation.



Chapter	Lecture	Contents
	B-24	Diseases caused by intestinal disorder, dyspepsia, Constipation, Gastric and peptic ulcer, Appendicitis, Worm related diseases, Diarrhea.
Chapter-06 (Transport in Organisms)	B-25	Plant and water relationship, Imbibition, Diffusion, Osmosis.
	B-26	Absorption of water and mineral salts, Translocation in plants, Necessity of translocation in plants, Translocation of water and minerals, Ascent of sap, Translocation of the substances produced in photosynthesis, Phloem translocation.
	B-27	Transpiration, Factors affecting transpiration, Transpiration is a necessary evil.
	B-28	Blood circulation in human body, Blood, Components of blood (Plasma, Blood corpuscles), Functions of blood.
	B-29	Blood group, Donation of blood and social responsibilities, Structure and function of heart.
	B-30	Circulation of blood through the heart, Blood vessels (artery, vein, capillaries).
	B-31	Blood pressure, Ideal blood pressure, Hypertension, Cholesterol, Demerits of high cholesterol, Functions of cholesterol- Usefulness and its risk.
	B-32	Irregularities in blood and bone marrow-Leukemia, Circulatory diseases and their remedies (Heart attack, Rheumatic fever, Measures to keep the heart sound).
Chapter-07 (Exchange of Gases)	B-33	Gas exchange in plants, Human respiratory system (Nasal cavity and nasal passage, Pharynx, Larynx, Trachea)
	B-34	Human respiratory system (Bronchus, Lungs, Diaphragm), Breathing
	B-35	Gaseous exchange, O_2 absorption, CO_2 transport, Diseases of respiratory system (Asthma)
	B-36	Diseases of respiratory system (Bronchitis, Pneumonia, Tuberculosis, Lung cancer)
Chapter-08 (Excretory System)	B-37	Excretory system, Excretory products, Kidney, Nephron
	B-38	Function of kidney, Role of kidneys in osmoregulation, Kidney stone, Kidney failure, Dialysis and kidney transplant, Precaution.
Chapter-09 (Firmness and Locomotion)	B-39	Introductions of human skeleton, Role of skeleton in firmness and locomotion
	B-40	Bone, Cartilage and Joint, Synovial joint, Types of joint
	B-41	Muscles, Roles of bones and muscles in human locomotion, Tendon and ligament
	B-42	Diseases of bones (Osteoporosis, Rheumatoid arthritis) (Review of the chapter)
Chapter-10 (Co-ordination)	B-43	Coordination in plants, Phytohormone (Auxin, Gibberellin, Cytokinin, Ethylene), Use of hormones (Growth, Movement, Phototropism)
	B-44	Coordination in animal (Influence of hormones, Influence of nerves), Nervous system, Central nervous system (Brain, spinal cord)
	B-45	Nervous system, Reflex action
	B-46	Peripheral nervous system, Autonomic nervous system, Transmission of impulse
	B-47	Hormone, Introduction of main endocrine gland, function and secreted hormones, Abnormalities due to hormone (Thyroid problem)
	B-48	Abnormalities due to hormone (Diabetes) Physical disabilities due to nerve disorder (Paralysis, Epilepsy, Parkinson disease), Influence of tobacco and drugs on co-ordination



ICT

Chapter	Lecture	Topics
Chapter-01 (Information & Communication Technology & Our Bangladesh)	ICT-01	The 21 st century and information and communication technology, Great ICT personalities, E-learning and Bangladesh, E-Governance and Bangladesh.
	ICT-02	E-service and Bangladesh, E-commerce and Bangladesh, ICT in the Job Sector, Social Networking and ICT, Entertainment and ICT.
Chapter-02 (Computer Maintenance and Cyber Security)	ICT-03	Computer Maintenance, Importance of Software in the Maintenance of Computer, Installation and Uninstallation of Software, Installation of Software, Deletion of Software.
	ICT-04	Information Security and Cyber Risk, Cyber Crime, Hacking, Brute Force Attack, Data Interception, DDoS Attack, Cyber Bullying, Fake News.
	ICT-05	The Strategies for Security over the Internet, Two Factor Authentication (2FA), Internet Addiction Disorder (IAD), Addiction to Computer Games, Addiction to Social Networking Site, The Way out of Addiction.
	ICT-06	Piracy, The Urgency of Copyright Law, Right to Information and Security, General Troubleshooting, Some Common Desktop Computer Problems and Solutions.
Chapter-03 (The Internet in my Education)	ICT-07	Internet, Digital content, Types of Digital Content, E-Book, Benefits of using E-Books, Different types of E-books.
	ICT-08	The Internet in Education, The Internet and my Academic Subjects, Web page and web portal, web page and web client, web client, web browser, Search engine.
Chapter-04 (My Writings and Accounts)	ICT-09	My Writing on Word Processor
	ICT-10	Spreadsheet and My Accounts Analysis of Spreadsheet

