

## Subject Wise Syllabus (Session: 2022-23) Class – XII (Science)

First Unit Test		
English	Flamingo	1. The Last Lesson 2. Lost Spring
	Vistas	1. The Third Level 2. The Tiger King 3. Journey to the end of the Earth
	Poetry	1. My Mother at Sixty Six
	A.W. Skills	1. Advertisements 2. Notices 3. Posters 4. Invitations (Formal and Informal; and Replies)
	Reading Skills	1. Unseen Passages/Poems 2. Note making 3. Summarising
Maths	<b>Ch-1. Relations and Functions:</b> Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Domain range of function. <b>Ch-2. Inverse Trigonometric Functions:</b> Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.	
Biology	<b>Unit-VI Reproduction Chapter-1: Reproduction in Organisms</b> Reproduction, a characteristic feature of all organisms for continuation of species; modes of reproduction - asexual and sexual reproduction; asexual reproduction - binary fission, sporulation, budding, gemmule formation, fragmentation; vegetative propagation in plants; events in sexual reproduction. <b>Chapter-2: Sexual Reproduction in Flowering Plants</b> Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes-apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation. <b>Chapter-3: Human Reproduction</b> Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea). <b>Chapter-4: Reproductive Health</b> Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies-IVF, ZIFT, GIFT, AI (elementary idea for general awareness. <b>Practical – Minimum 5</b>	
Physics	<b>Unit I: Electrostatics Chapter–1: Electric Charges and Fields</b> Electric Charges; Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside). <b>Chapter–2: Electrostatic Potential and Capacitance</b> Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor. <b>Unit II: Current Electricity Chapter–3: Current Electricity</b> Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power,	

Physics	electrical resistivity and conductivity, Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance. <b>Practical:</b> Three Experiments / Activities
Chemistry	<b>Unit I: Solid State</b> : Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects. Electrical and magnetic properties. Band theory of metals, conductors, semiconductors and insulators and n & p type semiconductors. <b>Unit – II : Solutions:</b> Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties - relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor. <b>Unit–III: Electrochemistry:</b> Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell -electrolytic cells and Galvanic cells, lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and emf of a cell, fuel cells, corrosion. <b>Practical : Minimum 5</b>
Computer Science	<b>Unit I: Computational Thinking and Programming – 2:</b> Revision of the basics of Python covered in Class XI. Functions: scope, parameter passing, mutable/immutable properties of data objects, passing strings, lists, tuples, dictionaries to functions, default parameters, positional parameters, return values, functions using libraries: mathematical and string functions, <b>Data-structures:</b> Stacks – Push, Pop using a list
IP.	<b>Unit 2: Database Query using SQL :</b> Math functions: POWER (), ROUND (), MOD (). Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING() /SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM (). Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME (). Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*). Querying and manipulating data using Group by, Having, Order by. Operations on Relations - Union, Intersection, Minus, Cartesian Product, JOIN (Cartesian Join, Equi Join, Natural Join)
Phy. Edu.	<b>Unit-I : Planning in Sports</b> <input type="checkbox"/> Meaning & Objectives Of Planning <input type="checkbox"/> Various Committees & its Responsibilities (pre; during & post) <input type="checkbox"/> Tournament – Knock-Out, League Or Round Robin & Combination <input type="checkbox"/> Procedure To Draw Fixtures–Knock-Out (Bye & Seeding) & League (Staircase & Cyclic) <input type="checkbox"/> Intramural & Extramural – Meaning, Objectives & Its Significance <input type="checkbox"/> Specific Sports Programme (Sports Day, Health Run, Run For Fun, Run For Specific Cause & Run For Unity) <b>Unit-II : Sports &amp; Nutrition</b> <input type="checkbox"/> Balanced Diet & Nutrition: Macro & Micro Nutrients <input type="checkbox"/> Nutritive & Non-Nutritive Components Of Diet <input type="checkbox"/> Eating For Weight Control –A Healthy Weight, The Pitfalls Of Dieting, Food Intolerance & Food Myths.
<b>Max. Marks : 25</b> <span style="margin-left: 150px;"><b>Min. Marks : 08</b></span> <span style="float: right;"><b>Time : 1.30 Hours</b></span>	
<b>Note for Exam. : Students will bring their next day's examination books and notebooks</b>	

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Second Unit Test		
English	Flamingo	3. Deep Water 4. The Rattrap
	Vistas	4. The Enemy 5. Should Wizard Hit Mommy 6. On the Face of It
	Poetry	2. An Elementary School Classroom in a Slum 3. Keeping Quiet
	A.W. Skills	5. Letters (a) Application for a job (b) Letter to the Editor (c) Business/Official letters
	Reading Skills	1. Unseen Passages/Poems 2. Note making 3. Summarising
Maths	<p><b>Ch-3. Matrices:</b> Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices; Addition, multiplication and scalar multiplication of matrices, simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Concept of elementary row and column operations. Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries). <b>Ch-4. Determinants:</b> Determinant of a square matrix (up to 3 x 3 matrices), properties of determinants, minors, cofactors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix. <b>Ch-5. Continuity and Differentiability:</b> Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretation. <b>Ch-6. Applications of Derivatives:</b> Applications of derivatives: rate of change of bodies, increasing/decreasing functions, tangents and normals, use of derivatives in approximation, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).</p>	
Biology	<p><b>Unit-VII Genetics and Evolution Chapter-5: Principles of Inheritance and Variation:</b> Heredity and variation, Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; linkage and crossing over; Sex determination - in human being, birds, grasshopper and honey bee; Mutation, Pedigree analysis, sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans – sickle cell anaemia, Phenylketonuria, thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes. <b>Chapter-6: Molecular Basis of Inheritance</b> Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Human and rice genome project; DNA fingerprinting. <b>Chapter-7: Evolution</b> Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); Darwin's contribution, Lamarck's theory of use and disuse of organs, modern synthetic theory of evolution; mechanism of evolution - variation (mutation and recombination) and</p>	

Biology	natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy - Weinberg's principle; adaptive radiation; human evolution. <b>Practical – Minimum 5</b>
Physics	<p><b>Unit II: Chapter – 3: Current Electricity (Remaining Part):</b> Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge. Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell. <b>Unit III: Magnetic Effects of Current and Magnetism Chapter-4: Moving Charges and Magnetism</b> Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields, Cyclotron. Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter. <b>Chapter-5: Magnetism and Matter</b> Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis, torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; earth's magnetic field and magnetic elements. Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths, permanent magnets. <b>Unit IV: Electromagnetic Induction and Alternating Currents Chapter-6: Electromagnetic Induction</b> Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents. Self and mutual induction and their application, Motional e.m.f. <b>Practical:</b> Three Experiments / Activities</p>
Chemistry	<p><b>Unit-IV: Chemical Kinetics:</b> Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenius equation <b>Unit-V: Surface Chemistry:</b> Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, catalysis, homogenous and heterogenous activity and selectivity of solid catalysts; enzyme catalysis colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion - types of emulsions. <b>Unit-VI : General Principles and Processes of Isolation of Elements:</b> Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron. <b>Unit-VII : p-Block Elements: Group -15 Elements:</b> General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; nitrogen preparation properties &amp; uses ; compounds of nitrogen, preparation and properties of ammonia and nitric acid, oxides of nitrogen (Structure only) ; Phosphorus - allotropic forms, compounds of phosphorus: preparation and properties of phosphine, halides (PCl<sub>3</sub> , PCl<sub>5</sub>) and oxoacids (elementary idea only). <b>Group 16 Elements:</b> General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: Preparation, Properties and uses, classification of oxides, Ozone, Sulphur and Sulphur dioxide -allotropic forms; compounds of sulphur: Preparation properties and uses of sulphuric</p>

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<b>Chemistry</b>	acid: industrial process of manufacture, properties and uses; oxoacids of sulphur (Structures only). <b>Group 17 Elements:</b> General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structures only). <b>Group 18 Elements:</b> General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses. <b>Practical : Minimum 5</b>
<b>Computer Science</b>	<b>Unit I: Computational Thinking and Programming – 2:</b> Using Python libraries: create and import Python libraries. • Recursion: simple algorithms with recursion: print a message forever, sum of first n natural numbers, factorial, Fibonacci numbers; recursion on arrays: binary search. • Idea of efficiency: performance measurement in terms of the number of operations. • Data-structures Queues – Insert, Delete using a list. • File handling: Need for a data file, Types of file: Text files, Binary files and CSV (Comma separated values) files. • Text File: Basic operations on a text file: Open (filename – absolute or relative path, mode) / Close a text file, Reading and Manipulation of data from a text file, Appending data into a text file, standard input/output and error streams, relative and absolute paths. • Binary File: Basic operations on a binary file: Open (filename – absolute or relative path, mode) / Close a binary file, Pickle Module – methods load and dump; Read, Write/Create, Search, Append and Update operations in a binary file. • CSV File: Import csv module, functions – Open / Close a csv file, Read from a csv file and Write into a csv file using csv.reader ( ) and csv.writerow().
<b>I.P.</b>	<b>Unit 1: Data Handling using Pandas and Data Visualization:</b> Data Handling using Pandas – I Introduction to Python libraries- Pandas, Matplotlib. Data structures in Pandas - Series and Data Frames. Series: Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing. Data Frames: creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add (insert /append), select, delete (drop column and row), rename, Head and Tail functions, indexing using labels, Boolean indexing; joining, merging and concatenation of data frames. Importing/Exporting Data between CSV files and Data Frames. (for practicals only)
<b>Phy. Edu.</b>	<b>Unit-III : Yoga &amp; Lifestyle</b> <input type="checkbox"/> Asanas as Preventive measures <input type="checkbox"/> Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana <input type="checkbox"/> Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pawan Muktasana, Ardh Matsyendrasana <input type="checkbox"/> Asthema: Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana <input type="checkbox"/> Hypertension: Tadasana, Vajrasana, Pawan Muktasana, Ardh Chakrasana, Bhujangasana, Shavasana <input type="checkbox"/> Back Pain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana <b>Unit-IV: Physical Education &amp; Sports for CWSN (Children with Special Needs-Divyang)</b> <input type="checkbox"/> Concept of Disability & Disorder <input type="checkbox"/> Types of Disability, its causes & nature (cognitive disability, intellectual disability, physical disability) <input type="checkbox"/> Types of Disorder, its cause & nature (ADHD, SPD, ASD, ODD, OCD) <input type="checkbox"/> Disability Etiquettes

<b>Phy. Edu</b>	<input type="checkbox"/> Advantage of Physical Activities for children with special needs <input type="checkbox"/> Strategies to make Physical Activities Accessible for children with special needs. <b>Unit V Children &amp; Women in Sports</b> <input type="checkbox"/> Motor development & factors affecting it <input type="checkbox"/> Exercise Guidelines at different stages of growth & Development <input type="checkbox"/> Common Postural Deformities - Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scoliosis and their corrective measures		
<b>Max. Marks : 25</b>		<b>Min. Marks : 08</b>	<b>Time : 1.30 Hours</b>
<b>Note for Exam. : Students will bring their next day's examination books and notebooks.</b>			
<b>First Term Exam (+1<sup>st</sup> Unit + 2<sup>nd</sup> Unit)</b>			
<b>English</b>	<b>Flamingo</b>	5. Indigo 6. Poets and Pancakes	
	<b>Vistas</b>	7. Evans Tries an O-Level	
	<b>Poetry</b>	4. A Thing of Beauty 5. A Roadside Stand	
	<b>A.W. Skills</b>	6. Article 7. Speech 8. Debate 9. Report	
	<b>Reading Skills</b>	1. Unseen Passages/Poems 2. Note making 3. Summarising	
<b>Maths</b>	<b>Ch-7. Integrals:</b> Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problem based on them. $\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2 + bx + c}}$ $\int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx, \int \sqrt{a^2 \pm x^2} dx, \int \sqrt{x^2 - a^2} dx$ $\int \sqrt{ax^2 + bx + c} dx, \int (px + q)\sqrt{ax^2 + bx + c} dx$ Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals. <b>Ch-8. Applications of the Integrals:</b> Applications in finding the area under simple curves, especially lines, circles/parabolas/ellipses (in standard form only), Area between any of the two above said curves (the region should be clearly identifiable). <b>Ch-9. Differential Equations:</b> Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type: $\frac{dy}{dx} + py = q$ , where p and q are functions of x or constant, $\frac{dx}{dy} + px = q$ , where p and q are functions of y or constant.		
<b>Biology</b>	<b>Unit-VIII Biology and Human Welfare Chapter-8: Human Health and Diseases</b> Pathogens; parasites causing human diseases (malaria, dengue, chickengunia, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse. <b>Chapter-9: Strategies for Enhancement in Food Production</b> Improvement in food production: Plant breeding, tissue culture, single cell protein,		

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<b>Biology</b>	Biofortification, Apiculture and Animal husbandry. <b>Chapter-10: Microbes in Human Welfare</b> In household food processing, industrial production, sewage treatment, energy generation and microbes as biocontrol agents and biofertilizers. Antibiotics; production and judicious use. <b>Unit-IX Biotechnology Principles and Processes Chapter-11: Biotechnology - Principles and processes</b> Genetic Engineering (Recombinant DNA Technology). <b>Chapter-12: Biotechnology and its Application:</b> Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, bio piracy and biopatents. <b>Practical – Minimum 4</b>
<b>Physics</b>	<b>Chapter–7: Alternating Current</b> Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits, power factor, wattles current. AC generator and transformer. <b>Unit V: Electromagnetic waves Chapter–8: Electromagnetic Waves</b> Basic idea of displacement current, Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses. <b>Unit VI: Optics Chapter–9: Ray Optics and Optical Instruments Ray Optics:</b> Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction and dispersion of light through a prism. Scattering of light - blue colour of sky and reddish appearance of the sun at sunrise and sunset. Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers. <b>Chapter–10: Wave Optics:</b> Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light, diffraction due to a single slit, width of central maximum, resolving power of microscope and astronomical telescope, polarisation, plane polarised light, Brewster's law, uses of plane polarised light and Polaroids. <b>Practical:</b> Four Experiments / Activities
<b>Chemistry</b>	<b>Unit – VIII : d and f Block Elements:</b> General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$ . <b>Lanthanoids</b> - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. <b>Actinoids</b> - Electronic configuration, oxidation states and comparison with lanthanoids. <b>Unit–IX: Coordination Compounds:</b> Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereo isomerism, importance of coordination compounds (in qualitative analysis extraction of metals and biological system). <b>Unit – X: Haloalkanes and Haloarenes: Haloalkanes:</b> Nomenclature, nature of C -X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation. <b>Haloarenes:</b> Nature of C -X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only) Uses and environmental effects of - dichloromethane,

<b>Chemistry</b>	trichloromethane, tetrachloromethane, iodoform, freons, DDT. <b>Unit – XI : Alcohols, Phenols and Ethers: Alcohols:</b> Nomenclature, methods of preparation, physical and chemical properties( of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol. <b>Phenols:</b> Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols. <b>Ethers:</b> Nomenclature, methods of preparation, physical and chemical properties, uses. <b>Practical : Minimum 5</b>
<b>Computer Science</b>	<b>Unit III: Database Management:</b> Database Concepts: Introduction to database concepts and its need. Relational data model: Concept of domain, relation, tuple, attribute, degree, cardinality, key, primary key, candidate key, alternate key and foreign key; Structured Query Language: General Concepts: Advantages of using SQL, Data Definition Language and Data Manipulation Language; Data Types: number / decimal, character / varchar / varchar2, date; SQL commands: CREATE TABLE, DROP TABLE, ALTER TABLE, UPDATE ....SET....., INSERT, DELETE; SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, LIKE, NULL / IS NULL, ORDER BY, GROUP BY, HAVING; SQL functions: SUM ( ), AVG ( ), COUNT ( ), MAX ( ) and MIN ( ); Joins: equi-join and natural join Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications
<b>I.P.</b>	<b>Data handling using Pandas – II</b> Descriptive Statistics: max, min, count, sum, mean, median, mode, quartile, Standard deviation, variance. DataFrame operations: Aggregation, group by, Sorting, Deleting and Renaming Index, Pivoting. Handling missing values – dropping and filling. Importing/Exporting Data between MySQL database and Pandas. <b>Data Visualization</b> :Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram, pie chart, frequency polygon, box plot and scatter plot. Customizing plots: color, style (dashed, dotted), width; adding label, title, and legend in plots.
<b>Phy. Edu.</b>	<b>Unit V Children &amp; Women in Sports</b> <input type="checkbox"/> Sports participation of women in India <input type="checkbox"/> Special consideration (Menarche & Menstrual Dysfunction) <input type="checkbox"/> Female Athletes Triad (Oestoperosis, Amenorrhoea, Eating Disorders) <b>Unit VI Test &amp; Measurement in Sports</b> <input type="checkbox"/> Motor Fitness Test – 50 M Standing Start, 600 M Run/Walk, Sit & Reach, Partial Curl Up, Push Ups (Boys), Modified Push Ups (Girls), Standing Broad Jump, Agility – 4x10 M ShuttleRun <input type="checkbox"/> General Motor Fitness– Barrow three item general motor ability (Standing Broad Jump, Zig Zag Run, Medicine Ball Put – For Boys: 03 Kg & For Girls: 01 Kg) <input type="checkbox"/> Measurement of Cardio Vascular Fitness– Harvard Step Test/Rockport Test -Computation of Fitness Index: Duration of the Exercise in Seconds x 100 <div style="text-align: center;">5.5 x Pulse count of 1-1.5 Min after Exercise</div> <input type="checkbox"/> Rikli & Jones- Senior Citizen Fitness Test 1. Chair Stand Test for lower body strength 2. Arm Curl Test for upper body strength 3. Chair Sit & Reach Test for lower body flexibility 4. Back Scratch Test for upper body flexibility 5. Eight Foot Up & Go Test for agility

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<b>Phy. Edu.</b>	6. Six Minute Walk Test for Aerobic Endurance <b>Unit VII Physiology &amp; Injuries in Sports</b> <input type="checkbox"/> Physiological factor determining component of Physical Fitness <input type="checkbox"/> Effect of exercise on Cardio Respiratory System <input type="checkbox"/> Effect of exercise on Muscular System <input type="checkbox"/> Physiological changes due to ageing <input type="checkbox"/> Sports injuries: Classification (Soft Tissue Injuries: (Abrasion, Contusion, Laceration, Incision, Sprain & Strain) Bone & Joint Injuries: (Dislocation, Fractures: Stress Fracture, Green Stick, Commuted, Transverse Oblique & Impacted) Causes, Prevention & treatment <input type="checkbox"/> First Aid– Aims & Objectives		
	<b>Max. Marks : 50</b>	<b>Min. Marks : 17</b>	<b>Time : 3.00 Hours</b>
<b>Note for Exam. : Students will bring their next day's examination books and notebooks</b>			

<b>Second Term Exam. (+ 1<sup>st</sup> Unit + 2<sup>nd</sup> Unit + 1<sup>st</sup> Term)</b>		
<b>English</b>	<b>Flamingo</b>	7. The Interview 8. Going Places
	<b>Vistas</b>	8. Memories of Childhood
	<b>Poetry</b>	5. Aunt Jennifer's Tigers
	<b>Reading Skills</b>	1. Unseen Passages/Poems 2. Note making 3. Summarising
<b>Maths</b>	<b>Ch-10. Vectors:</b> Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, Properties and application of Scalar (dot) product of vectors. Vector (cross) product of vectors. Scalar triple product of vectors. <b>Ch-11. Three - dimensional Geometry:</b> Direction cosines and direction ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes. (iii) a line and a plane. Distance of a point from a plane. <b>Ch-13. Probability:</b> Conditional probability, multiplication theorem on probability. independent events, total probability, Baye's theorem, Random variable and its probability distribution, mean and variance of random variable. Binomial probability distribution, <b>Ch-12. Linear Programming:</b> Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).	
<b>Biology</b>	<b>Unit-X Ecology and Environment Chapter-13: Organisms and Populations</b> Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism, commensalism; population attributes - growth, birth rate and death rate, age distribution. <b>Chapter-14: Ecosystem</b> Ecosystems: Patterns, structure and function; components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services - carbon fixation, pollination, seed dispersal, oxygen release (in brief). <b>Chapter-15: Biodiversity and its Conservation</b> Concept of biodiversity; levels patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data	

<b>Biology</b>	Book, sacred grooves biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites. <b>Chapter-16: Environmental Issues</b> Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change; impact, mitigation, ozone layer depletion; deforestation; any one case study as success story addressing environmental issue(s). <b>Practical: Complete Remaining</b>
<b>Physics</b>	<b>Unit VII: Dual Nature of Radiation and Matter Chapter–11: Dual Nature of Radiation and Matter</b> Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Matter waves-wave nature of particles, de-Broglie relation, Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained). <b>Unit VIII: Atoms and Nuclei Chapter–12: Atoms</b> Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum, Total Energy of H-atom. <b>Chapter–13: Nuclei</b> Composition and size of nucleus, Radioactivity, alpha, beta and gamma particles/rays and their properties; radioactive decay law. Half life and mean life, Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion. <b>Unit IX: Electronic Devices Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits</b> Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Semiconductor diode-I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell and Zener diode and their characteristics, zener diode as a voltage regulator. <b>Practical: Complete Remaining</b>
<b>Chemistry</b>	<b>Unit XII: Aldehydes, Ketones and Carboxylic Acids: Aldehydes and Ketones:</b> Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes: uses. <b>Carboxylic Acids:</b> Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses. <b>Unit - XIII : Organic compounds containing Nitrogen: Amines:</b> Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. <b>Cyanides and Isocyanides</b> - will be mentioned at relevant places in text. Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry. <b>Unit–XIV: Biomolecules: Carbohydrates</b> -Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen) importance of carbohydrates. <b>Proteins</b> -Elementary idea of $\alpha$ -amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure. <b>Vitamins</b> - Classification and functions. <b>Nucleic Acids:</b> DNA and RNA. <b>Unit - XV: Polymers:</b> Classification - natural and synthetic, methods of polymerization (addition and condensation), copolymerization, some important polymers: natural and synthetic like polythene, nylon polyesters, bakelite, rubber. Biodegradable and non-biodegradable polymers. <b>Unit– XVI: Chemistry in Everyday life:</b> Chemicals in medicines- analgesics, tranquilizers antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines. Chemicals in food – Preservatives artificial sweetening agents, elementary idea of antioxidants. Cleansing agents-soaps and detergents, cleansing action. <b>Practical: Minimum 5</b>
<b>Computer Science</b>	<b>Unit II: Computer Networks:</b> Evolution of Networking: ARPANET, Internet, Interspace Different ways of sending data across the network with reference to switching

## Subject Wise Syllabus (Session: 2022-23) Class – XII (Science)

<b>Computer Science</b>	<p>techniques (Circuit and Packet switching). • Data Communication terminologies: Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, Kbps, Mbps, Gbps, Tbps). • Transmission media: Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link. • Network devices: Modem, RJ45 connector, Ethernet Card, Router, Switch, Gateway, WiFi card. • Network Topologies and types: Bus, Star, Tree, PAN, LAN, WAN, MAN. • Network Protocol: TCP/IP, File Transfer Protocol (FTP), PPP, HTTP, SMTP, POP3, Remote Login (Telnet) and Internet, Wireless / Mobile Communication protocol such as GSM, GPRS and WLL. • Mobile Telecommunication Technologies: 1G, 2G, 3G, 4G and 5G; Mobile processors; Electronic mail protocols such as SMTP, POP3, Protocols for Chat ,and Video Conferencing: VoIP, Wireless technologies such as Wi-Fi and WiMax 8, • Introduction To Web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP); Domain Names; URL; Website, Web browser, Web Servers; Web Hosting • Networking concepts • Web scripts • E-Commerce</p>
<b>I.P.</b>	<p><b>Unit 3: Introduction to Computer Networks:</b> Introduction to networks, Types of network: LAN, MAN, WAN. Network Devices: modem, hub, switch, repeater, router, gateway Network Topologies: Star, Bus, Tree, Mesh. Introduction to Internet, URL, WWW and its applications- Web, email, Chat, VoIP. Website: Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website. Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies. <b>Unit 4: Societal Impacts:</b> Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act. E-waste: hazards and management. Awareness about health concerns related to the usage of technology.</p>
<b>Phy. Edu.</b>	<p><b>Unit VIII Biomechanics &amp; Sports</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Meaning and Importance of Biomechanics in Sports</li> <li><input type="checkbox"/> Types of movements (Flexion, Extension, Abduction &amp; Adduction)</li> <li><input type="checkbox"/> Newton’s Law of Motion &amp; its application in sports</li> <li><input type="checkbox"/> Friction &amp; Sports</li> </ul> <p><b>Unit IX Psychology &amp; Sports</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Personality; its definition &amp; types – Trait &amp; Types (Sheldon &amp; Jung Classification) &amp; Big Five Theory</li> <li><input type="checkbox"/> Motivation, its type &amp; techniques</li> <li><input type="checkbox"/> Exercise Adherence; Reasons to Exercise, Benefits of Exercise</li> <li><input type="checkbox"/> Strategies for Enhancing Adherence to Exercise</li> <li><input type="checkbox"/> Meaning, Concept &amp; Types of Aggressions in Sports</li> </ul> <p><b>Unit X Training in Sports</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Strength – Definition, types &amp; methods of improving Strength – Isometric, Isotonic &amp; Isokinetic</li> <li><input type="checkbox"/> Endurance - Definition, types &amp; methods to develop Endurance – Continuous Training, Interval Training &amp; Fartlek Training</li> <li><input type="checkbox"/> Speed – Definition, types &amp; methods to develop Speed – Acceleration Run &amp; Pace Run</li> <li><input type="checkbox"/> Flexibility – Definition, types &amp; methods to improve flexibility</li> <li><input type="checkbox"/> Coordinative Abilities – Definition &amp; types</li> <li><input type="checkbox"/> Circuit Training - Introduction &amp; its importance</li> </ul>
<p><b>Max. Marks : 100 (Th: 70 + Pr. 30) Min. Marks : 33 Time : 3.00 Hours</b></p>	
<p><b>Note for Exam. : Students will bring their next day’s examination books and notebooks</b></p>	

### Pre-Board Exam. (Whole Syllabus)

**Max. Marks : 100 (Th: 70 + Pr. 30) Min. Marks : 33 Time : 3.00 Hours**

#### Books Prescribed (XII Science Stream)

S. No.	Subject	Name of the Book(s)	Publishers
1	ENG	GUIDE - ENGLISH CORE	LAXMI Pub.
2	ENG	FLAMINGO - ENGLISH	NCERT
3	ENG	VISTAS - ENGLISH	NCERT
4	MATHS	MATHEMATICS EXEMPLAR	NCERT
5	MATHS	MATHEMATICS	NCERT
6	MATHS	MATHEMATICS LAB ACTIVITIES WITH RECORD BOOK	GOYAL BROTHERS
7	PHY.	PHYSICS	DHANPAT RAI & COMP. (S.L.Arora)
8	PHY.	PHYSICS - (PART I & II)	NCERT
9	PHY.	LAB MANUAL	UNIVERSAL PUBLICATION
10	CHEM.	CHEMISTRY	MODERN ABC
11	CHEM.	CHEMISTRY (PART -I & II)	NCERT
12	CHEM.	LAB MANUAL	UNIVERSAL PUBLICATION
13	BIO	BIOLOGY	MODERN ABC
14	BIO	BIOLOGY	NCERT
15	BIO	LAB MANUAL	UNIVERSAL PUBLICATION
16	COMP.	COMPUTER SCIENCE - C++ (SUMITA A.)	DHANPAT RAI & COMP.
17	COMP.	PRACTICAL FILE - COMPUTER SCIENCE	J.B. PUBLISHING HOUSE
18	I.P.	INFORMATICS PRACTICES	DHANPAT RAI & COMP.
19	I.P.	PRACTICAL FILE - INFORMATICS PRACTICES	J.B. PUBLISHING HOUSE
20	P.ED.	PHYSICAL EDUCATION	SARASWATI PUBLICATION

#### **Instructions:-**

1. Value Education consists of Moral Values, Manners & Etiquettes.
2. Value Education will be taught by the class teacher for 10 minutes in zero period everyday.