ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS FOR THE SESSION 2026- '27

CLASS: XII SUB: Biology

NAME OF THE TEACHER: SHARMILA DEY

CHAPTER NO.	CHAPTER NAME	TOPIC	SUB TOPIC	NAME OF EXAMINATION	DIGITAL RESOURCES
1	Unit-VI Reproduction	Sexual Reproduction in Flowering plants. Human Reproduction. Reproductive Health:	Structure of flowers, pollination, fertilization, and seed formation. Male and female reproductive systems, gametogenesis, menstrual cycle, fertilization, and development.	PD1+MT+PB	Human reproduction: https://youtu.be/jsiE37y8goA?si=WpSV37p64bmZdWYx Reproductive Health: https://youtu.be/48glmtbYLsQ?si=8aWnQ_0wQKW_SEJx

			Contraception, sexually transmitted diseases (STDs), MTP, and infertility.		Reproduction in Plants: https://youtu.be/IW8hbdNGhBE?si=mm9dYP1QrPOrkGxV
2	Unit-VIII Biology and Human welfare.	Human Health and Diseases. Microbes in Human Welfare.	Pathogens, immunity, vaccines, cancer, and HIV/AIDS. Microbes in food processing, industrial, and sewage treatment.	PD2+MT+PB	Human health and diseases: https://youtu.be/FSN4b5MgAq8?si=OSRyRWLgBPNWU_e9 Microbes in human welfare: https://youtu.be/ka_rvqVnlNo?si=rC85cab3lgbQc6tl

3	Unit-VII Genetics and Evolution .	Principles of Inheritance and Variation. Molecular Basis of Inheritance. Evolution .	Mendelian genetics, sex determination, and genetic disorders. DNA structure, replication, transcription, genetic code, and protein synthesis. Origin of life, Darwin's theory, Hardy-Weinberg principle, and human evolution.	MT+PB	https://youtu.be/fuglbkNZ7ac?si=E2y7oj-s_KDu5IGJ
4	Unit IX: Biotechnology	Biotechnology - Principles and	Genetic engineering and recombinant DNA technology.	PB	Principles and processes: https://youtu.be/pumZiybEwdE?si=

		Processes. Biotechnology and its Applications	Genetically modified organisms (GMOs), gene therapy, and transgenic animals.		yKxrBtrJk7PIjesx Applications: https://youtu.be/530GYX9C1vU?si=mpqKToyuTkgOOAUz
5	Unit X: Ecology	Organisms and Populations. Ecosystem. Biodiversity and Conservation	Habitat, niches, and population growth. Productivity, decomposition, and energy flow. Importance, loss, and conservation strategies.	PB	Ecosystem: https://youtu.be/042LD-Xnt3A?si=Yv3V3AXv-PbRStEV Biodiversity: https://youtu.be/XLRxoLcyhuw?si=0eLJ9U6mLJ2E0eaH

ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS FOR THE SESSION 2026- '27

CLASS: XII SUB: CHEMISTRY

NAME OF THE TEACHER: SOUMI KARMAKAR

CHAPTER NO.	CHAPTER NAME	TOPIC	SUB TOPIC	NAME OF EXAMINATION	DIGITAL RESOURCES
1	Solutions	Roult's law. Colligative properties. Types of solutions. Van't Hoff factors.	Raoult's law. Colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass.	PD1+MT+PB	https://youtu.be/wLE1BT_wDo4?si=lxd4Y-_at7H4fw5N

			Solutions, Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions. Van't Hoff factor.		
2	Electroche mistry	Redox reaction Nernst equation Gibbs free energy, EMF. Electrolysis and its laws.	Redox reactions, 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	PD2+ MT+ PB	https://youtu.be/8RAhlFtABhU?si=Wxzvp7uMW6wawPo7

		Conductivity of electrolyte solutions. Fuel cells.	Kohlrausch's Law Electrolysis and law of electrolysis (elementary idea)		
3	Chemical kinetics	Rate laws. Rate constants Factors effecting rate of reactions. Activation energy. Arrhenius equation.	Rate of a reaction (Average and instantaneous) Rate law and specific rate constant Integrated rate equations and half-life (only for zerfirst-order order reactions) Concept of collision theory (elementary idea, no mathematical treatment)	MT+ PB	https://youtu.be/JT2hDAn17bQ?si=LFCQIg8Dx7RNITga

			Factors affecting rate of reaction: concentration, temperature, catalyst; Order and molecularity of a reaction Activation energy Arrhenius equation.		
4	d and f block elements	Lanthanoids. Actinoids. Electronic configurations Oxidation states. Magnetic properties.	Lanthanoids- Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. Actinoids- Electronic configuration, oxidation states	PD1+MT+PB	https://youtu.be/KG5tILDPG3U?si=IVKvJmmhglfGz_Rq

			and comparison with lanthanoids. **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, color, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of K2Cr2O7 and KMnO4.**		

5	Coordination compounds	Introduction of compounds and legends. IUPAC nomenclature. Bonding of compounds. VBT ,CFT theory. Stereomerism	Coordination compounds - Introduction, ligands, coordination number, color, magnetic properties and shapes The importance of coordination compounds (in qualitative analysis, extraction of metals and biological system). IUPAC nomenclature of mononuclear coordination compounds. Bonding	MT +PB	https://youtu.be/HjW5250qb_g?si=CKoago-r2OhERWnM

			Werner's theory, VBT, and CFT; structure and stereoisomerism		
6	Halo alkanes and Haloarenes	Haloarenes. Halo alkenes. Nomenclatures Chemical properties. Different types of Haloarenes and haloalkenes and its reactions.	Haloarenes: Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloro methane, tetrachloromethane, iodoform, freons, DDT. Haloalkanes: Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation	PD2+MT+PB	https://youtu.be/CyC5v-5al-4?si=hsAq-egFpVQOsorX

			mechanism of substitution reactions.		
7	Alcohols , phenols and ethers	Phenols,its nomenclatures, Ethers and its properties. Alcohols and its chemical reaction and properties.	Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols. Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses. Alcohols: Nomenclature, methods of preparation,	PB	https://youtu.be/7yCbbjWrE6A?si=mikMJstLRuo5uGK3

			physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, and uses with special reference to methanol and ethanol.		
8	Aldehydes, ketones and carboxylic acids	Carboxylic acid,its nomenclatures and chemical properties. Ketones and aldehydes - its properties, reactions.	Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses. Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of	PB	https://youtu.be/tfM6-iEd6Ac?si=SXb6la2GmmbJ6h6H

			preparation, physical and chemical properties, mechanism of nucleophilic addition, the reactivity of alpha hydrogen in aldehydes, uses.		
9	Amines	Diazonium salts. Amines.	Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry. Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, and identification of primary,	PB	https://youtu.be/tfM6-iEd6Ac?si=u8_baBLuYVZ5LU3H

			secondary and tertiary amines.		
10	Biomolecules	Proteins. Vitamins. Carbohydrates. DNA, RNA and nucleic acid.	Proteins - Elementary idea of - 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. Vitamins - Classification and functions.	PB	https://youtu.be/qew8jac0z7g?si=gF5lHlTSakbwJP_m

			Carbohydrates - Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates.		

ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS FOR THE SESSION 2026- '27

CLASS: XII **SUB: ARTIFICIAL INTELLIGENCE**

NAME OF THE TEACHER: SUMANA MANDAL & SUVAS LOHAR

EMPLOYABILITY SKILLS					
CHAPTER NO.	CHAPTER NAME	TOPIC	SUB TOPIC	NAME OF EXAMINATION	DIGITAL RESOURCES
1	Communication Skills-IV	• Advanced Communication Skills • Presentation Skills • Public Speaking • Writing Skills (Formal & Informal) • Group Discussion • Interview Skills	Importance of effective communication, Barriers to communication, Techniques to improve communication, Planning a presentation, Structure: Introduction, Body language	PD-I+MT	https://youtu.be/L0qw3P3YCdg?si=we6AIF-EWDNKj2Ys
2	Self-Management Skills-IV	• Self-Awareness and Personality • Self-Motivation • Time Management • Stress Management • Goal Setting • Leadership and Teamwork	Self-Awareness and Personality, Self-Motivation, Time Management, Stress Management, Goal Setting	PD-I+MT	https://youtu.be/L0qw3P3YCdg?si=we6AIF-EWDNKj2Ys

3	ICT Skills-IV	• Introduction to Advanced ICT • Operating System and File Management • Digital Documentation • Electronic Spreadsheet • Digital Presentation • Database Management System	Types of Operating Systems, File Organization, Document Formatting, Formulas and Functions in Spreadsheet, Slide Design and Layout	PD-II+MT	https://youtu.be/L0qw3P3YCdg?si=we6AIF-EWDNKj2Ys
4	Entrepreneurial Skills-IV	• Entrepreneurship and Society • Qualities of a Successful Entrepreneur • Business Idea Generation • Business Plan Development • Marketing and Sales • Financial Management	Role of Entrepreneurship in Society, Entrepreneurial Traits and Skills, Identifying Business Opportunities, Steps in Business Planning, Marketing Strategies and Sales Techniques	PD-II+PD-III+MT	https://youtu.be/L0qw3P3YCdg?si=we6AIF-EWDNKj2Ys
5	Green Skills-IV	• Sustainable Development • Green Economy • Environmental Protection • Resource Conservation • Waste Management • Renewable Energy	Principles of Sustainable Development, Concepts of Green Economy,, Conservation of Natural Resources, Waste Management Techniques	PD-III	https://youtu.be/L0qw3P3YCdg?si=we6AIF-EWDNKj2Ys
SUBJECT SPECIFIC SKILLS					
1	Python Programming – II*	• Advanced Python Concepts • Functions and Modules • File Handling • Data Structures (List, Tuple, Dictionary, Set) • Exception Handling • Introduction to Libraries and Packages	Advanced Data Types and Operations, Defining and Using Functions, File Handling Techniques, Lists, Tuples, Dictionaries and Sets, Exception Handling and Errors	PD-I+MT	https://youtu.be/8QFiL3HTc-4?si=3MqxAq-yBTuKIZmT

2	Data Science Methodology: An Analytic Approach to Capstone Project	• Introduction to Data Science Methodology • Problem Definition (Problem Scoping) • Data Collection and Data Preparation • Data Analysis and Interpretation • Model Building and Evaluation • Reporting and Presentation of Results	Understanding Data Science Methodology, Problem Scoping and Definition, Data Collection and Preparation, Data Analysis and Interpretation, Model Building and Evaluation	PD-I+MT	https://youtu.be/Jlc2-mbpOBo?si=EOMM8Y64dcvjNJY0
3	Making Machines See	• Introduction to Computer Vision • Image Acquisition • Image Processing Techniques • Feature Detection and Extraction • Image Classification • Applications of Computer Vision	Basics of Computer Vision, Image Acquisition Methods, Image Processing Techniques, Feature Detection and Extraction, Image Classification Methods	PD-I+MT	https://youtu.be/98b-v2E9Vns?si=ZIlmdIeiWfEib4wm
4	AI with Orange Data Mining Tool*	• Introduction to Orange Data Mining Tool • Installation and Interface Overview • Data Loading and Preprocessing • Data Visualization in Orange • Building Machine Learning Models • Evaluation of Models	Setting up the Tool, Exploring the Workspace, Importing Data Files, Cleaning and Preparing Data, Visualizing Data Patterns	PD-II+MT	https://youtu.be/3IxMsFL2OTM?si=7Kp8mWLOWeSIcshW
5	Introduction to Big Data and Data Analytics	• Introduction to Big Data • Characteristics of Big Data (5 V's) • Sources of Big Data • Data Analytics and its Types • Tools and Technologies for Data Analytics • Applications of Big Data and Analytics	Definition of Big Data, Volume, Velocity, Variety, Veracity, Value, Data Generation Sources, Descriptive Analytics, Predictive	PD-II+MT	https://youtu.be/KMfx8rubFg4?si=wl4mdHxdHiCrm6Fr

			Analytics, Data Analytics Tools		
6	Understanding Neural Networks	• Introduction to Neural Networks • Biological Neuron vs Artificial Neuron • Structure of Neural Network (Layers) • Working of Neural Networks • Training of Neural Networks • Applications of Neural Networks	Concept of Neural Networks, Components of Biological Neuron, Components of Artificial Neuron, Input, Hidden, Output Layers, Forward and Backpropagation, Supervised Learning in Neural Networks	PD-II+MT	https://youtu.be/IUQEdolhk0k?si=dDg6Tli5le4N43gW
7	Generative AI	• Introduction to Generative AI • Types of Generative Models • Working of Generative AI • Applications of Generative AI • Ethical Issues in Generative AI • Future Scope of Generative AI	Definition and Overview, GANs and VAEs, Model Training Process, Content Generation Applications, Ethical Concerns in AI, Emerging Trends and Future Possibilities	PD-III+MT	https://youtu.be/ibP4oaThyR0?si=TWT-N0mrzML6ijK7
8	Data Storytelling	• Introduction to Data Storytelling • Importance of Data Storytelling • Elements of Data Storytelling (Data, Narrative, Visuals) • Data Visualization Techniques • Designing Effective Data Stories • Presenting Insights and Conclusions	Definition of Data Storytelling, Significance in Decision Making, Components: Data, Narrative, Visuals, Charts and Graphs, Story Design Principles, Presenting Insights Clearly	PD-III	https://youtu.be/RzlajcDOGiY?si=xHNTTyFhQiRedloo

ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS FOR THE SESSION 2026- '27

CLASS:XII SUB: MATHEMATICS

NAME OF THE TEACHER: SANTANU DAS

CHAPTER NO.	CHAPTER NAME	TOPIC	SUB TOPIC	NAME OF EXAM	DIGITAL RESOURCES
1	Relations and Functions	• Introduction • Types of relation • Types of Functions • Composition of functions and Invertible Function	Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions.	PD-I + MT + PB	https://youtu.be/NYCjVHSSNKM?si=QRqp1dkBw03mXgWx
2	Inverse Trigonometric Functions	• Introduction • Basic Concepts • Properties of Inverse Trigonometric Functions	Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions	PD-I + MT + PB	https://youtu.be/JDEod1lmAwg?si=BlQb_aiL_ia1Z9kV
3	Matrices	• Introduction • Matrix • Types of Matrix • Operation on Matrices • Trtanspose of a Matrix	Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operations on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-	PD-I + MT + PB	https://youtu.be/MYF034ZUKxo?si=Y5GjFaWM6sAEtE6H

		• Symmetric and skew symmetric matrices • Elementary Operation of a Matrix • Invertible Matrices	commutativity of multiplication of matrices and existence of nonzero matrices whose product is the zero matrix (restrict to square matrices of order 2). Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).		
4	Determinants	• Introduction • Determinant • Properties of Determinants • Area of triangle • Minors and cofactors • Adjoint and Inverse of a Matrix • Application od Determinants and Matrices	Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors 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.	PD-II + MT + PB	https://youtu.be/2NncYZhn6FI?si=hgTDluT_TObBhIBg
5	Continuity and Differentiability	• Introduction • Continuity • Differentiability • Exponential and Logarithmic Function • Logarithmic Differentiation • Derivatives of Functions in Parametric form • Second order Derivatives • Mean Value Theorem	Continuity and differentiability, chain rule, derivative of composite functions, derivatives of inverse trigonometric functions like $\sin^{-1} x$, $\cos^{-1} x$ and $\tan^{-1} x$, 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.	PD-II + MT + PB	https://youtu.be/cnpv-t2DGiw?si=I-ToRiZGESmJHIdH
6	Applications of Derivatives	• Introduction • Rate of change of Quantities	Applications of derivatives: rate of change of quantities, increasing/decreasing functions,	PD-II + MT + PB	

		• Increasing and Decreasing Functions • Tangents and Normals • Approximations • Maxima and Minima	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).		https://youtu.be/fy4m6lZ9YwA?si=2AfFTRGPTKS2npZM
7	Integrals	• Introduction • Integration as an Inverse Process of Differentiation • Methods of Integration • Integrals of Some Particular Functions • Integration by Partial Fractions • Integration by Parts • Definite Integral • Fundamental Theorem of Calculus • Evaluation of Definite Integrals by Substitution • Some Properties of Definite Integrals	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 problems based on them. $\int \frac{dx}{x^2 \pm a^2}$, $\int \frac{dx}{\sqrt{x^2 \pm a^2}}$, $\int \frac{dx}{\sqrt{a^2 - x^2}}$, $\int \frac{dx}{ax^2+bx+c}$, $\int \frac{dx}{\sqrt{ax^2+bx+c}}$, $\int \frac{px+q}{ax^2+bx+c}dx$, $\int \frac{px+q}{\sqrt{ax^2+bx+c}}dx$, $\int \sqrt{a^2 \pm x^2}\,dx$, $\int \sqrt{x^2 - a^2}\,dx$, $\int \sqrt{ax^2 + bx + c}\,dx$ Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.	PD-III + PB	https://youtu.be/dBglfhVX6kI?si=TV80FMF5YR7DwLIr
8	Application of the Integrals	• Introduction • Area under Simple Curves	Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only)	PD-III + PB	https://youtu.be/InR343-9vFY?si=kwDVf_CRaSecDrpv

9	Differential Equations	• Introduction • Basic Concepts • General and Particular Solutions of a Differential Equation • Methods of Solving First Order, First Degree • Differential Equations	Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type: $dy/dx + py = q$, where p and q are functions of x or constants. $dx/dy + px = q$, where p and q are functions of y or constants.	PD-III + PB	https://youtu.be/4r-0JSfGez4?si=gZ5dj4-BhNsM1Jwz
10	Vectors	• Introduction • Some Basic Concepts • Types of Vectors • Addition of Vectors • Multiplication of a Vector by a Scalar • Product of Two Vectors	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.	PD-III + PB	https://youtu.be/U7nSbEZyYnA?si=qFikKViHCx0XnV2c
11	Three-dimensional Geometry	• Introduction • Direction Cosines and Direction Ratios of a Line • Equation of a Line in Space • Angle between Two Lines • Shortest Distance between Two Lines	Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines	PD-III + PB	https://youtu.be/ZVNj0mJC0LI?si=72AZomXr2loD_hPp

12	Linear Programming	• Introduction • Linear Programming Problem and its Mathematical Formulation	Introduction, related terminology such as constraints, objective function, optimization, 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).	PD-III + PB	https://youtu.be/HWD_SGXILF4?si=nxA0RKK6fFD4RLrh
13	Probability	• Introduction • Conditional Probability • Multiplication Theorem on Probability • Independent Events • Bayes' Theorem	Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem.	PD-III + PB	https://youtu.be/I4WvS7_rk8k?si=wPBE0RcXesAsvi0h

ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS STRUCTURE

for

STD. XII | SESSION: 2026-27 | SUBJECT: PHYSICS | TEACHERS: SMU

CHPATER NO.	Chapter Name	TOPIC	SUBTOPIC	EXAM	DIGITAL RESOURCES
PART-I					
1	Electric Charges and Fields	• 1.1 Introduction • 1.2 Electric Charge • 1.3 Conductors and Insulators • 1.4 Basic Properties of Electric Charge • 1.5 Coulomb's Law • 1.6 Forces between Multiple Charges • 1.7 Electric Field • 1.8 Electric Field Lines • 1.9 Electric Flux • 1.10 Electric Dipole • 1.11 Dipole in a Uniform External Field • 1.12 Continuous Charge Distribution • 1.13 Gauss's Law • 1.14 Applications of Gauss's Law	✔ Mathematical formulation of Coulomb's law ✔ Vectorial form of Coulomb's law ✔ Similarity of nature with the Law of gravitation ✔ Electric field mathematical formulation ✔ Electric field lines and flux ✔ Dipoles and its stability ✔ Dipole in presence of external electric field – torque and potential energy ✔ Statement and mathematical structure of Gauss's law	PD-I + MT + PB + AT	https://youtu.be/vvOxKA9dups?si=a8gAySVG5Yc9lhZx

			✔ Charge distributions: continuous and discrete ✔ Numerical problems		
2	Electrostatic Potential and Capacitance	• 2.1 Introduction • 2.2 Electrostatic Potential • 2.3 Potential due to a Point Charge • 2.4 Potential due to an Electric Dipole • 2.5 Potential due to a System of Charges • 2.6 Equipotential Surfaces • 2.7 Potential Energy of a System of Charges • 2.8 Potential Energy in an External Field • 2.9 Electrostatics of Conductors • 2.10 Dielectrics and Polarisation • 2.11 Capacitors and Capacitance • 2.12 The Parallel Plate Capacitor • 2.13 Effect of Dielectric on Capacitance • 2.14 Combination of Capacitors • 2.15 Energy Stored in a Capacitor	✔ Electrostatic potential energy and electrostatic potential – mathematical formulation ✔ Potential due to symmetrically distributed system of charges ✔ Conductor and dielectrics in electrostatic fields and polarization ✔ Equipotential surfaces ✔ Capacitance – definition and mathematical description ✔ Parallel plate capacitor – detailed discussion ✔ Series and parallel combination of capacitors ✔ Derivation of energy stored in a capacitor ✔ Numerical problems	PD-I + MT + PB + AT	https://youtu.be/nNhivhwHSRo?si=L6HCRu7Nskt_1GLn
3	Current Electricity	• 3.1 Introduction • 3.2 Electric Current • 3.3 Electric Currents in Conductors • 3.4 Ohm's law	✔ Idea of electric current ✔ Ohm's law – mathematical description and	PD-I + MT + PB + AT	https://youtu.be/MBkJmR2qii0?si=bViKkW8UfKHIPiCj

		• **3.5 Drift of Electrons and the Origin of Resistivity** • **3.6 Limitations of Ohm's Law** • **3.7 Resistivity of Various Materials** • **3.8 Temperature Dependence of Resistivity** • **3.9 Electrical Energy, Power** • **3.10 Cells, emf, Internal Resistance** • **3.11 Cells in Series and in Parallel** • **3.12 Kirchhoff's Rules** • **3.13 Wheatstone Bridge**	graphical representation - Resistivity of materials - Temperature dependence of resistivity - Drift velocity of electrons - Series and parallel combination of electrical circuits – mathematical idea - Kirchhoff's rules – node rule and loop rule - Wheatstone bridge - Numerical problems		
4	**Moving Charges and Magnetism**	• **4.1 Introduction** • **4.2 Magnetic Force** • **4.3 Motion in a Magnetic Field** • **4.4 Magnetic Field due to a Current Element, Biot-Savart Law** • **4.5 Magnetic Field on the Axis of a Circular Current Loop** • **4.6 Ampere's Circuital Law** • **4.7 The Solenoid** • **4.8 Force between Two Parallel Currents, the Ampere** • **4.9 Torque on Current Loop, Magnetic Dipole** • **4.10 The Moving Coil Galvanometer**	- Advent of magnetism - Moving charges and magnetic field - Fundamental mathematical description of magnetic field - Magnetic field calculation for: Circular ring (axis), straight wire, solenoid (using Ampere's circuital law) - Force on wire due to magnetic field - Torque on current loop in a magnetic field - Moving coil galvanometer and its	**PD-II + MT + PB + AT**	**https://youtu.be/xWMT4UeOcgU?si=G2cCDHFdaoOuzTHv**

			usage as – Ammeter and voltmeter Numerical problems		
5	Magnetism and Matter	• 5.1 Introduction • 5.2 The Bar Magnet • 5.3 Magnetism and Gauss's Law • 5.4 Magnetisation and Magnetic Intensity • 5.5 Magnetic Properties of Materials	Bar magnet and Earth's magnetic field Magnetization and magnetic intensity – defined Describing materials based on the magnetic properties of matter: Ferro, Para and Dia magnetic materials Gauss's law for magnetostatics	PD-II + MT + PB + AT	https://youtu.be/4luRD2B6OME?si=Br_meo6Yat5KoUFI
6	Electromagnetic Induction	• 6.1 Introduction • 6.2 The Experiments of Faraday and Henry • 6.3 Magnetic Flux • 6.4 Faraday's Law of Induction • 6.5 Lenz's Law and Conservation of Energy • 6.6 Motional Electromotive Force • 6.7 Inductance • 6.8 AC Generator	Faraday's law and Electromagnetic induction Magnetic flux and magnetic flux density Lenz's law and induced emf and current Motion emf Inductance of coils AC as an application of Electromagnetic induction Numerical problems	PD-II + MT + PB + AT	https://youtu.be/90WhVAKzoig?si=FNORRy8rn-gHZZDV
7	Alternating Current	• 7.1 Introduction • 7.2 AC Voltage Applied to a Resistor • 7.3 Representation of AC Current and Voltage by Rotating Vectors — Phasors • 7.4 AC Voltage Applied to an Inductor	L, C, R, LCR circuits – mathematical formulation and idea Phasor diagrams for electrical quantities Power, average power, RMS for AC Power factor and loss of energy Numerical problems	MT + PB + AT	https://youtu.be/j5wR8pfqyh4?si=2xuLF2ewnXb_DyzR

		• 7.5 AC Voltage Applied to a Capacitor • 7.6 AC Voltage Applied to a Series LCR Circuit • 7.7 Power in AC Circuit: The Power Factor			
8	Electromagnetic Waves	• 8.1 Introduction • 8.2 Displacement Current • 8.3 Electromagnetic Waves • 8.4 Electromagnetic Spectrum	✚ How current flows through capacitor: Displacement current ✚ Electromagnetic wave spectrum ✚ Numerical problems	PB + AT	https://youtu.be/mnBOXYcD6y4?si=YSktw6UuDxdpuZIR
PART-II					
9	Ray Optics and Optical Instruments	• 9.1 Introduction • 9.2 Reflection of Light by Spherical Mirrors • 9.3 Refraction • 9.4 Total Internal Reflection • 9.5 Refraction at Spherical Surfaces and by Lenses • 9.6 Refraction through a Prism • 9.7 Optical Instruments	✚ Mathematical Analysis of reflection by spherical mirrors ✚ Refraction thorough lenses and total internal reflection ✚ Optical instruments: telescopes and microscopes ✚ Numerical problems	PB + AT	https://youtu.be/aWZrNhD2S3k?si=QOcmUFPKTDW7DIKW
10	Wave Optics	• 10.1 Introduction • 10.2 Huygens Principle • 10.3 Refraction and Reflection of Plane Waves using Huygens Principle • 10.4 Coherent and Incoherent Addition of Waves	✚ Huygens principle and the wave nature of light ✚ Superposition of waves and its intensity ✚ Path difference and coherency ✚ Phenomena related to wave nature of light: Interference and Diffraction of light	PB + AT	https://youtu.be/yY6ChKn7thM?si=BU_l4Vx4VeTOK5_j

		• 10.5 Interference of Light Waves and Young's Experiment • 10.6 Diffraction • 10.7 Polarisation	✔ Polarization of light ✔ Numerical problems		
11	Dual Nature of Radiation and Matter	• 11.1 Introduction • 11.2 Electron Emission • 11.3 Photoelectric Effect • 11.4 Experimental Study of Photoelectric Effect • 11.5 Photoelectric Effect and Wave Theory of Light • 11.6 Einstein's Photoelectric Equation: Energy Quantum of Radiation • 11.7 Particle Nature of Light: The Photon • 11.8 Wave Nature of Matter	✔ Electron emission and photo electric effect – particle nature of light ✔ Experimental setup and analysis of photo electric effect ✔ Einstein's description of photoelectric effect: energy quantum of radiation ✔ Wave an particle nature of object	PB + AT	https://youtu.be/OHOsygOzlBU?si=dtxRQ_90-x8kWbO-
12	Atoms	• 12.1 Introduction • 12.2 Alpha-particle Scattering and Rutherford's Nuclear Model of Atom • 12.3 Atomic Spectra • 12.4 Bohr Model of the Hydrogen Atom • 12.5 The Line Spectra of the Hydrogen Atom • 12.6 DE Broglie's Explanation of Bohr's Second Postulate of Quantisation	✔ Rutherford's experiment and the structure of Atom ✔ Atomic spectra and Bohr's model of single electronic system ✔ Hydrogen atom spectra and its mathematical analysis ✔ Numerical problems	PB + AT	Atoms & Nuclei: https://youtu.be/gLmA8UPIYPU?si=TJzMd-GBH4x7ToY7
13	Nuclei	• 13.1 Introduction • 13.2 Atomic Masses and Composition of Nucleus • 13.3 Size of the Nucleus	✔ Atomic properties: Atomic mass, proton mass and density ✔ Size of a nucleus	PB + AT	

		• **13.4 Mass-Energy and Nuclear Binding Energy** • **13.5 Nuclear Force** • **13.6 Radioactivity** • **13.7 Nuclear Energy**	✔ Independency of nuclear density on nuclear size ✔ Mass defect and Binding energy: Mathematical description ✔ Nuclear forces ✔ Radioactivity and nuclear energy ✔ Numerical problems		
14	**Semiconductor Electronics**	• **14.1 Introduction** • **14.2 Classification of Metals, Conductors and Semiconductors** • **14.3 Intrinsic Semiconductor** • **14.4 Extrinsic Semiconductor** • **14.5 p-n Junction** • **14.6 Semiconductor Diode** • **14.7 Application of Junction Diode as a Rectifier**	✔ Differentiate between conductors, semi-conductors and non-conductors/insulators ✔ Intrinsic and extrinsic semi-conductors – mathematical description ✔ Mechanism of creation of p-n junction for diode ✔ Full-wave and half-wave rectifier as an application to p-n junction diodes ✔ Numerical problems	**PB + AT**	**https://youtu.be/YGWiJ3xcxCA?si=rlLRK8LoQWwtMOHa**

ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS FOR THE SESSION 2026- '27

CLASS: XII SUB: English

NAME OF THE TEACHER: JAYASHREE PALMAL

CHAPTER NO.	CHAPTER NAME	TOPIC	SUB TOPIC	NAME OF EXAMINATION	DIGITAL RESOURCES
	FLAMINGO 1)The last lesson 2)Lost Spring	1)love for one's language and country 2) childhood loss due to poverty and child labour 3) fear of losing a loved ones and reality of aging 4) over coming fear loneliness,	Inside questions textual grammar and vocabulary	P D 1 and M T and Pre Board	I https://youtu.be/le_drhF4YeI?si=e4OX4Nuo40olULEH https://youtu.be/4LZtF5eeHMY?si=t_ryE_zPhQDZXSq9

	3)My Mother at sixty six VISTAS 4)on the face of it	and judging people beyond appearance			3)https://youtu.be/hylaNZ0qV5o?si=P3J3lFz9TR2rH7zf 4)https://youtu.be/NH4TFTLB0pA?si=0K0xVB7w-ryfxYB7
	FLAMINGO 5)Deep Water	5) overcoming fear through courage and determination		P D 2 and M T and Pre Board	5) https://youtu.be/oQLi31YxSOs?si=JotI5lmDouTV0Sd_

	6) Keeping Quiet 7) Poets and Pancakes VISTAS 8) The Tiger king	6) importance of silence peace and self reflection 7) humorous and realistic looks at the film industry and human nature 8) futility of pride and power and trying to escape fate	Inside question textual grammar and vocabulary		6)https://youtu.be/71ZUoT-z0AI?si=NT7He53tXUa1lEjs 7)https://youtu.be/fZm3C5e3qlI?si=euFoft8n8yl3YVYb 8)https://youtu.be/1CYyO7wEWiQ?si=JI5yMYA-VKH6I5kF

	FLAMINGO **9) The Rattrap** **VISTAS** **10) memories of childhood**	**9) kindness and compassion reform a person and help them to escape from the traps of life** **10) childhood experience of discrimination and injustice**	**Inside Questions textual grammar and vocabulary**	**M T and Pre Board**	**9)https://youtu.be/rvmaM-lMGdc?si=7IXHIIhKdUAyuehb** **10)https://youtu.be/XMjt1RbA9Ec?si=E2av-G7YvanFeNjE**
	FLAMINGO **11)Indigo**	**11) struggle against injustice and power of non violence**	**Inside question textual grammar and**	**Pre Board**	**11)https://youtu.be/lfQKLucj6Es?si=LfAwktQD9TSrbI9g**

	12)A thing of beauty 13) Interview 14) Going Places 15)Aunt Jennifer's Tiger	12) beauty is eternal and gives everlasting Joy and peace 13) the power and influence and drawbacks of interviews 14) the conflict between dreams and reality 15) oppression of women and their desire for freedom	vocabulary		12)https://youtu.be/5hRxngpPaJM?si=yfXZfTthTVNUBAOo 13)https://youtu.be/yvf3VU7tDPs?si=YfiSLN7nL_qxD1a- 14)https://youtu.be/fN0vhNnHX70?si=lvZQn1DAX1gZEDCI

	VISTAS 16) Journey to the end of the earth	16) adventure and exploration			15)https://youtu.be/IcK3TUGLElw?si=t8ncztHnkL5pg_Xs 16)https://youtu.be/g_56IUJdj9c?si=xAYN_S9bZdk5uq9-
	FLAMINGO 17)A roadside stand VISTAS 18) Enemy	17) poverty struggle and the gap between rural and urban life 18) humanity and compassion in the face of enmity and war	Inside question textual grammar and vocabulary	Pre Board	17)https://youtu.be/u7m5-x8ZBko?si=R1SM-ZiSeKfaKMY9 18)https://youtu.be/C_GN9cTB7Zs?si=-wy_huMjS2Ken4ca

	19)Third level	19)theme of escapism from the stresses of modern life			19)https://youtu.be/P9RvmRPWGLA?si=-Xjr299yhiAx3NF3
			GRAMMAR AND WRITING SKILLS		
	All Grammars Editing Gap filling Sentence re ordering Tenses	Understanding an application of the given chapters	Understanding interpreting and improving reading skills	P D 1 and M T and Pre Board	

	Active and passive **Voice** **Direct and indirect speech** **Clauses** **Determiners** **Preposition** **Unseen Passage** **Unseen Factual case based Passage** **Notice** **Formal and Informal Invitation and Reply**				

	All Grammars Editing Gap filling Sentence re ordering Tenses Active and passive Voice Direct and indirect speech Clauses Determiners Preposition Unseen Passage Unseen Factual case	Understanding an application of the given chapters	Understanding interpreting and improving reading skills	P D 2 and M T and Pre Board	

	based Passage Application for job Editorial letters				
	All Grammars Editing Gap filling Sentence re ordering Tenses Active and passive Voice Direct and indirect speech Clauses	Understanding an application of the given chapters	Understanding interpreting and improving reading skills	Pre Board	

	Determiners **Preposition** **Unseen Passage** **Unseen Factual case based Passage** **Article** **Report**				

ST. NICHOLAS PUBLIC SCHOOL, GARHBETA

SYLLABUS FOR THE SESSION 2026- '27

CLASS: XII **SUB: HPE** **NAME OF THE TEACHER: SR/SN**

Theory + Practical= 70+30= 100

Theory (70)

CHAPTER NO.	CHAPTER NAME	TOPICS	NAME OF EXAMINATION	DIGITAL RESOURCES
1	Management of Sporting Events	1. Functions of Sports Events Management (Planning, Organizing, Staffing, Directing & Controlling) 2. Various Committees & their Responsibilities (pre; during & post) 3. Fixtures and their Procedures – Knock Out (Bye & Seeding) & League (Staircase, Cyclic, Tabular method) and Combination tournaments. 4. Intramural & Extramural tournaments – Meaning, Objectives & Its Significance 5. Community sports program (Sports Day, Health Run, Run for Fun, Run for Specific Cause & Run for Unity)	PD-1 + Mid-term + Annual	1. https://youtu.be/qd8_D1cq0WY?si=tVT9fgaL1Nvgyel0
2	Children and Women in Sports	1. Exercise guidelines of WHO for different age groups. 2. Common postural deformities-knock knees, flat foot, round shoulders, Lordosis, Kyphosis, Scoliosis, and bow legs	PD-1 + Mid-term + Annual	1. https://youtu.be/71YJ4o6ZNk0?si=wsgfXZgPcluEel5i

		and their respective corrective measures. 3. Women's participation in Sports – Physical, Psychological, and social benefits. 4. Special consideration (menarche and menstrual dysfunction) 5. Female athlete triad (osteoporosis, amenorrhea, eating disorders.		
3	Yoga as Preventive measure for Lifestyle Disease	1. Obesity: Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Pavanmuktasana, Matsayasana, Halasana, Pachimottansana, Ardha – Matsyendrasana, Dhanurasana, Ushtrasana, Suryabedhan pranayama 2. Diabetes: Procedure, Benefits & Contraindications for Katichakrasana, Pavanmuktasana,Bh ujangasana, Shalabhasana, Dhanurasana, Supta - vajarasana, Paschimottanasan -a, Ardha - Mastendrasana, Mandukasana, Gomukasana, Yogmudra, Ushtrasana, Kapalabhati. 3. Asthma: Procedure, Benefits & Contraindications for Tadasana, Urdhwahastottansan a, UttanMandukasan - a, Bhujangasana, Dhanurasana, Ushtrasana, Vakrasana, Kapalbhati, Gomukhasana Matsyaasana, Anuloma -Viloma. 4. Hypertension: Procedure, Benefits & Contraindications for Tadasana, Katichakransan, Uttanpadasana, Ardha Halasana, Sarala Matyasana, Gomukhasana, UttanMandukasan - a, Vakrasana, Bhujangasana,	**PD-1 + Mid-term + Annual**	1. https://youtu.be/vODLQXO58LM?si=39j3EQhhLXysWFth

		Makarasana, Shavasana, Nadi - shodhanapranayam, Sitlipranayam. 5. Back Pain and Arthritis: Procedure, Benefits & Contraindications of Tadasan, Urdhawahastootansa na, ArdhChakrasana, Ushtrasana, Vakrasana, Sarala Maysyendrsana, Bhujandgasana, Gomukhasana, Bhadrasana, Makarasana, NadiShodhana pranayama		
4	Physical Education & Sports for CWSN	1. Organizations promoting Disability Sports (Special Olympics; Paralympics; Deaflympics) 2. Concept of Classification and Divisioning in Sports. 3. Concept of Inclusion in sports, its need, and Implementation; 4. Advantages of Physical Activities for children with special needs. 5. Strategies to make Physical Activities assessable for children with special needs.	PD-2 + Mid-term + Annual	1. https://youtu.be/VpOZxGb2XP8?si=av6fdlYfNIHQHpkF
5	Sports & Nutrition	1. Concept of balanced diet and nutrition 2. Macro and Micro Nutrients: Food sources & functions 3. Nutritive & NonNutritive Components of Diet 4. Eating for Weight control – A Healthy Weight, The Pitfalls of Dieting, Food Intolerance, and Food Myths 5. Importance of Diet in Sports-Pre, During and Post competition Requirements.	PD-2 + Mid-term + Annual	1. https://youtu.be/9K71r2XfYX4?si=gFf24U_sSvB-1xe3
6	Test and Measurement in Sports	1. Fitness Test – SAI Khelo India Fitness Test in school: Age group 5-8 years/ class 1-3: BMI, Flamingo Balance Test, Plate Tapping Test Age group 9-18yrs/ class 4-12: BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach flexibility test, Strength Test (Partial Abdominal Curl Up,	PD-2 +Mid-term + Annual	1. https://youtu.be/WeF6VjiC6XA?si=IAJSZmuNBSuiMOGC

		Push-Ups for boys, Modified Push-Ups for girls). 2. Measurement of Cardio - Vascular Fitness – Harvard Step Test – Duration of the Exercise in Seconds x100/5.5 X Pulse count of 1 -1.5 Min after Exercise. 3. Computing Basal Metabolic Rate (BMR) 4. Rikli & Jones - Senior Citizen Fitness Test • Chair Stand Test for lower body strength • Arm Curl Test for upper body strength • Chair Sit & Reach Test for lower body flexibility • Back Scratch Test for upper body flexibility • Eight Foot Up & Go Test for agility • Six - Minute Walk Test for Aerobic Endurance. Johnsen – Methney Test of Motor Educability (Front Roll, Roll, Jumping Half-Turn, Jumping full-turn		
7	Physiology & Injuries in Sport	Physiology & Injuries in Sport 1. Physiological factors determining components of physical fitness 2. Effect of exercise on the Muscular System 3. Effect of exercise on the Cardio Respiratory System 4. Physiological changes due to aging 5. Sports injuries: Classification (Soft Tissue Injuries - Abrasion, Contusion, Laceration, Incision, Sprain & Strain; Bone & Joint Injuries - Dislocation, Fractures - Green Stick, Comminuted, Transverse Oblique & Impacted.	**PD-3 + Annual**	1. https://youtu.be/GvzCvGtWT0I?si=hysvmUs1xIAn8rsd
8	Biomechanics and Sports	Biomechanics and Sports 1. Newton's Law of Motion & its application in sports 2. Types of Levers and their application in Sports. 3. Equilibrium – Dynamic & Static and Centre of Gravity and its	**PD-3 + Annual**	1. https://youtu.be/8ZEzAE7KY1A?si=XNApgCf9QddoD-Tz

		application in sports 4. Friction & Sports 5. Projectile in Sports		
9	Psychology and Sports	1. Personality; its definition & types (Jung Classification & Big Five Theory) 2. Motivation, its type & techniques. 3. Exercise Adherence: Reasons, Benefits & Strategies for Enhancing it 4. Meaning, Concept & Types of Aggressions in Sports 5. Psychological Attributes in Sports – Self-Esteem, Mental Imagery, Self-Talk, Goal Setting	PD-3 + Annual	1. https://www.youtube.com/live/tX-E6z-YgOA?si=O2oq6OiXdDKkv1GS
10	Training in Sports	2. Introduction to Sports Training Cycle – Micro, Meso, Macro Cycle. 3. Types & Methods to Develop – Strength, Endurance, and Speed. 4. Types & Methods to Develop – Flexibility and Coordinative Ability. 5. Circuit Training - Introduction & its importance	Annual +Annual	1. https://youtu.be/fMIBtQ9WLUI?si=VGmkBiz2vFWhfegZ

Internal Assessment (Practical)-30

component	marks
Physical Fitness Test: SAI Khelo India Test / Brockport Physical Fitness Test	6
Proficiency in Games and Sports	7
Yogic Practices	7
Record File	5
Viva Voce	5
Total	30