Grade XII (2025-26)

Number of Paper:1Time:3 HoursMax Marks:80

No.	Units	Marks
I	Numbers, Quantification and Numerical	11
	Applications	
II	Algebra	10
	Calculus	15
IV	Probability Distributions	10
V	Inferential Statistics	05
VI	Time-based data	06
VII	Financial Mathematics	15
VIII	Linear Programming	08
	Total	80
	Internal Assessment	20

	<u>CLASS- XII</u>			
SI. No.	Contents	Learning Outcomes: Students will be able to	Notes / Explanation	
UNIT	UNIT – 1 NUMBERS, QUANTIFICATION AND NUMERICAL APPLICATIONS			
Numb	ers & Quantificat	ion		
1.1	Modulo Arithmetic	 Define modulus of an integer Apply arithmetic operations using modular arithmetic rules 	 Definition and meaning Introduction to modulo operator Modular addition and subtraction 	
1.2	Congruence Modulo	 Define congruence modulo Apply the definition in various problems 	 Definition and meaning Solution using congruence modulo Equivalence class 	
1.3	Alligation and Mixture	 Understand the rule of alligation to produce a mixture at a given price Determine the mean price of a mixture Apply rule of allegation 	 Meaning and Application of rule of alligation Mean price of a mixture 	
1.4	Numerical Problems	Solve real life problems mathema	atically	
	Boats and Streams (upstream and downstream)	 Distinguish between upstream and downstream Express the problem in the form of an equation 	 Problems based on speed of stream and the speed of boat in still water 	
	Pipes and Cisterns	 Determine the time taken by two or more pipes to fill or empty the tank 	 Calculation of the portion of the tank filled or drained by the pipe(s) in unit time 	
	Races and Games	 Compare the performance of two players w.r.t. time, distance 	 Calculation of the time taken/ distance covered / speed of each player 	
1.5	Numerical Inequalities	 Describe the basic concepts of numerical inequalities Understand and write numerical inequalities 	 Comparison between two statements/situations which can be compared numerically Application of the techniques of numerical solution of algebraic inequations 	

UNIT-	2 ALGEBRA		
2.1	Matrices and types of matrices	 Define matrix Identify different kinds of matrices. Find the size / order of matrices 	 The entries, rows and columns of matrices Present a set of data in a matrix form
2.2	Equality of matrices, Transpose of a matrix, Symmetric and Skew symmetric matrix	 Determine equality of two matrices Write transpose of given matrix Define symmetric and skew symmetric matrix 	 Examples of transpose of matrix A square matrix as a sum of symmetric and skew symmetric matrix Observe that diagonal elements of skew symmetric matrices are always zero
2.3	Algebra of Matrices	 Perform operations like addition & subtraction on matrices of same order Perform multiplication of two matrices of appropriate order Perform multiplication of a scalar with matrix 	 Addition and Subtraction of matrices Multiplication of matrices (It can be shown to the students that Matrix multiplication is similar to multiplication of two polynomials) Multiplication of a matrix with a real number
2.4	Determinants	 Find determinant of a square matrix 	 Singular matrix, Non- singular matrix AB = A B Simple problems to find determinant value
2.5	Inverse of a matrix	 Define the inverse of a square matrix Apply properties of inverse of matrices 	 Inverse of a matrix using cofactors If A and B are invertible square matrices of same size, i) (AB)⁻¹ = B⁻¹A⁻¹ ii) (A⁻¹)⁻¹ = A iii) (A')⁻¹ = (A⁻¹)'
2.6	Solving system of simultaneous equations using matrix method and Cramer's rule	 Solve the system of simultaneous equations using i) Cramer's Rule ii) Inverse of coefficient matrix Formulate real life problems into a system of simultaneous linear equations and solve it using these methods 	 Solution of system of simultaneous equations up to three variables only (non- homogeneous equations)

UNIT-3 CALCULUS

Differentiation and its Applications

Dillei		Applications	
3.1	Derivatives up to second order	 Determine derivatives up to second order Understand differentiation of parametric functions and implicit functions 	 Simple problems based on up to second order derivatives Differentiation of parametric functions and implicit functions (upto 2nd order)
3.2	Application of Derivatives	 Determine the rate of change of various quantities 	 To find the rate of change of quantities such as area and volume with respect to time or its dimension
3.3	Marginal Cost and Marginal Revenue using derivatives	 Define marginal cost and marginal revenue Find marginal cost and marginal revenue 	 Examples related to marginal cost, marginal revenue, etc.
3.4	Increasing /Decreasing Functions	 Determine whether a function is increasing or decreasing Determine the conditions for a function to be increasing or decreasing 	 Simple problems related to increasing and decreasing behaviour of a function in the given interval
3.5	Maxima and Minima	 Determine critical points of the function Find the point(s) of local maxima and local minima and corresponding local maximum and local minimum values Find the absolute maximum and absolute minimum value of a function Solve applied problems related to optimization of cost, revenue and profit only. 	 A point x = c is called the critical point of f if f is defined at c and f'(c) = 0 or f is not differentiable at c To find local maxima and local minima by: i) First Derivative Test ii) Second Derivative Test Contextualized real life problems
Integr	Integration and its Applications		
3.6	Integration	 Understand and determine indefinite integrals of simple functions as anti- derivative 	 Integration as a reverse process of differentiation Vocabulary and Notations related to Integration

3.7	Indefinite Integrals as family of curves	 Evaluate indefinite integrals of simple algebraic functions by method of: i) substitution ii) partial fraction iii) by parts Simple integrals based of each method (not trigonometric function) 		
3.8	Definite Integrals as area under the curve	 Define definite integral as area under the curve Understand fundamental theorem of Integral calculus and apply it to evaluate the definite integral 	• Evaluation of area under simple algebraic curves up to 2 nd degree.	
3.9	Application of Integration	 Identify the region representing consumer surplus and producer surplus graphically Apply the definite integral to find consumer surplus- producer surplus 	 Problems based on finding Total cost when Marginal Cost is given Total Revenue when Marginal Revenue is given Equilibrium price and equilibrium quantity and hence consumer and producer surplus 	
Differ	Differential Equations and Modeling			
3.10	Differential Equations	 Recognize a differential equation Find the order and degree of a differential equation 	 Definition, order, degree and examples 	
3.11	Formulating and Solving Differential Equations	 Formulate differential equation Verify the solution of differential equation Solve simple differential equation using variable separable method only 	 Formation of differential equation by eliminating arbitrary constants Solution of simple differential equations (direct integration only) 	
	4 PROBABILITY	DISTRIBUTIONS		
4.1	Probability Distribution	 Understand the concept of Random Variables and its Probability Distributions Find probability distribution of discrete random variable 	 Definition and example of discrete and continuous random variable and their distribution 	
4.2	Mathematical Expectation	 Apply arithmetic mean of frequency distribution to find the expected value of a random variable 	• The expected value of discrete random variable as summation of product of discrete random variable by the probability of its occurrence.	
4.3	Variance	Calculate the Variance and S.D. of a random variable	 Questions based on variance and standard deviation 	

4.4	Binomial Distribution	 Identify the Bernoulli Trials and apply Binomial Distribution Evaluate Mean, Variance and S.D of a binomial distribution 	• Characteristics of binomial distribution • Binomial formula: $P(r) = n_{C_r} p^r q^{n-r}$ Where n = number of trials p =probability of success q = probability of failure Mean = np Variance = npq Standard deviation = \sqrt{npq}
4.5	Poison Distribution	 Understand the Conditions of Poisson Distribution Evaluate the Mean and Variance of Poisson distribution 	• Characteristics of Poisson Probability distribution Poisson formula: $P(X) = \frac{\lambda^{x}e^{-\lambda}}{x!}$ • Mean = Variance = λ
4.6	Normal Distribution	 Understand normal distribution is a Continuous distribution Evaluate value of Standard normal variate Area relationship between Mean and Standard Deviation 	 Characteristics of a normal probability distribution Total area under the curve = total probability = 1 Standard Normal Variate: Z = x-μ/σ, where x = value of random variable, μ = mean, σ = S.D
	- 5 INFERENTIAL	STATISTICS	- Dopulation data from
0.1	Sample	 Define Population and Sample Differentiate between population and sample Define a representative sample from a population Differentiate between a representative and non- representative sample Draw a representative sample using simple random sampling Draw a representative sample using and systematic random sampling 	 Population data from census, economic surveys and other contexts from practical life Examples of drawing more than one sample set from the same population Examples of representative and non-representative sample Unbiased and biased sampling Problems based on random sampling using simple random sampling and systematic random sampling (sample size less than 100)

5.2	Parameter and Statistics and Statistical Interferences	 Define Parameter with reference to Population Define Statistics with reference to Sample Explain the relation between Parameter and Statistic Explain the limitation of Statistic to generalize the estimation for population Interpret the concept of Statistical Significance and Statistical Inferences State Central Limit Theorem Explain the relation between Population-Sampling Distribution-Sample 	 Conceptual understanding of Parameter and Statistics Examples of Parameter and Statistic limited to Mean and Standard deviation only Examples to highlight limitations of generalizing results from sample to population Only conceptual understanding of Statistical Significance/Statistical Inferences Only conceptual understanding of Sampling Distribution through simulation and graphs
5.3	t-Test (one sample t-test and for a small group sample)	 Define a hypothesis Differentiate between Null and Alternate hypothesis Define and calculate degree of freedom Test Null hypothesis and make inferences using t-test statistic for one group 	 Examples and non- examples of Null and Alternate hypothesis (only non- directional alternate hypothesis) Framing of Null and Alternate hypothesis Testing a Null Hypothesis to make Statistical Inferences for small sample size (for small sample size: t- test for one group)
UNIT -	-6 TIME-BASED	DATA	
6.1	Time Series	 Identify time series as chronological data 	 Meaning and Definition
6.2	Components of Time Series	 Distinguish between different components of time series 	 Secular trend Seasonal variation Cyclical variation Irregular variation
6.3	Time Series analysis for univariate data	 Solve practical problems based on statistical data and interpret the result 	 Fitting a straight-line trend and estimating the value
6.4	Secular Trend	 Understand the long-term tendency 	•The tendency of the variable to increase or decrease over a long period of time
6.5	Methods of Measuring trend	 Demonstrate the techniques of finding trend by different methods 	 Moving Average method Method of Least Squares

UNIT -	7 FINANCIAL M	ATHEMATICS	
7.1	Perpetuity, Sinking Funds	 Explain the concept of perpetuity and sinking fund Calculate perpetuity Differentiate between sinking fund and saving account 	 Meaning of Perpetuity and Sinking Fund Real life examples of sinking fund Advantages of Sinking Fund Sinking Fund vs. Savings account
7.2	Valuation of Bonds	 Define the concept of valuation of bond and related terms. Calculate value of bond using present value approach 	 Meaning of Bond Valuation Terms related to valuation of bond: Coupon rate, Maturity rate and Current price. Bond Valuation Method: Present Value Approach
7.3	Calculation of EMI	 Explain the concept of EMI Calculate EMI using various methods 	 Methods to calculate EMI: i) Flat-Rate Method ii) Reducing-Balance Method Real life examples to calculate EMI of various types of loans, purchase of assets, etc.
7.4	Compound Annual Growth Rate	 Understand the concept of Compound Annual Growth Rate Differentiate between Compound Annual Growth Rate and Annual Growth Rate Calculate Compound Annual Growth Rate 	 Meaning and use of Compound Annual Growth Rate Formula for Compound Annual Growth Rate
7.5	Linear method of Depreciation	 Define the concept of linear method of Depreciation Interpret cost, residual value and useful life of an asset from the given information Calculate depreciation 	 Meaning and formula for Linear Method of Depreciation Advantages and disadvantages of Linear Method
UNIT -	8 LINEAR PROG	RAMMING	
8.1	Introduction and related terminology	 Familiarize with terms related to Linear Programming Problem 	 Need for framing linear programming problem Definition of Decision Variable, Constraints, Objective function, Optimization and Non negative constraints

8.2	Mathematica I formulation of Linear Programmin g Problem	• Formulate Linear Programming Problem upto 3 non-trivial constraints	 Set the problem in terms of decision variables, identify the objective function, identify the set of problem constraints, express the problem in terms of inequations
8.3	Different types of Linear Programming Problems	 Identify and formulate different types of LPP 	 Formulate various types of LPP's like Manufacturing Problem, Diet Problem etc.
8.4	Graphical method of solution for problems in two variables	 Draw the Graph for a system of linear inequalities involving two variables and to find its solution graphically 	 Corner Point Method for the Optimal solution of LPP
8.5	Feasible and Infeasible Regions	 Identify feasible, infeasible, bounded and unbounded regions 	 Definition and Examples to explain the terms
8.6	Feasible and infeasible solutions, optimal feasible solution	 Understand feasible and infeasible solutions Find optimal feasible solution 	 Problems based on optimization Examples of finding the solutions by graphical method

Practical: Use of spreadsheet

Graphs of an exponential function, demand and supply functions on Excel and study the nature of function at various points, maxima/minima, Matrix operations using Excel

Suggested practical using the spreadsheet

- i) Plot the graphs of functions on excel and study the graph to find out the point of maxima/minima
- ii) Probability and dice roll simulation
- iii) Matrix multiplication and the inverse of a matrix
- iv) Stock Market data sheet on excel
- v) Collect the data on weather, price, inflation, and pollution analyze the data and make meaningful inferences
- vi) Collect data from newspapers on traffic, sports activities and market trends and use excel to study future trends

List of Suggested projects (Class XI /XII)

- i) Use of prime numbers in coding and decoding of messages
- ii) Prime numbers and divisibility rules
- iii) Logarithms for financial calculations such as interest, present value, future value, profit/loss etc. with large values)
- iv) The cardinality of a set and orders of infinity
- v) Comparing sets of Natural numbers, rational numbers, real numbers and others
- vi) Use of Venn diagram in solving practical problems
- vii) Fibonacci sequence: Its' history and presence in nature
- viii) Testing the validity of mathematical statements and framing truth tables
- ix) Investigating Graphs of functions for their properties
- x)
 Visit
 the
 census
 site
 of
 India

 http://www.censusindia.gov.in/Census_Data_2001/Census_Data_0nline/Languag
 e/State ment3.html
 Depict the information given there in a pictorial form
- xi) Prepare a questionnaire to collect information about money spent by your friends in a month on activities like travelling, movies, recharging of the mobiles, etc. and draw interesting conclusions
- xii) Check out the local newspaper and cut out examples of information depicted by graphs. Draw your own conclusions from the graph and compare it with the analysis given in the report
- xiii) Analysis of population migration data positive and negative influence on urbanization
- xiv) Each day newspaper tells us about the maximum temperature, minimum temperature, and humidity. Collect the data for a period of 30 days and represent it graphically. Compare it with the data available for the same time period for the previous year
- xv) Analysis of career graph of a cricketer (batting average for a batsman and bowling average for a bowler). Conclude the best year of his career. It may be extended for other players also tennis, badminton, athlete
- xvi) Vehicle registration data correlating with pollution and the number of accidents
- xvii) Visit a village near Delhi and collect data of various crops over the past few years from the farmers. Also, collect data about temperature variation and rain over the period for a particular crop. Try to find the effect of temperature and rain variations on various crops
- xviii) Choose any week of your ongoing semester. Collect data for the past 10 15 years for the amount of rainfall received in Delhi during that week. Predict the amount of rainfall for the current year
- xix) Weather prediction (prediction of monsoon from past data)
- xx) Visit Kirana shops near your home and collect the data regarding the sales of certain commodities over a month. Try to figure out the stock of a particular commodity which should be in the store in order to maximize the profit
- xxi) Stock price movement
- xxii) Risk assessments by insurance firms from data
- xxiii) Predicting stock market crash
- xxiv) Predicting the outcome of an election exit polls
- xxv) Predicting mortality of infants

COURSE STRUCTURE CLASS XII (2025 - 26) (THEORY)

Time: 03 Hours

Max. Marks: 70

Unit	Title	Marks
VI	Reproduction	16
VII	Genetics and Evolution	20
VIII	Biology and Human Welfare	12
IX	Biotechnology and its Applications	12
X	Ecology and Environment	10
	Total	70

Unit-VI Reproduction

Chapter-1: Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; out breeding 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.

Chapter-2: Human Reproduction

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).

Chapter-3: Reproductive Health

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 (elementary idea for general awareness).

Unit-VII Genetics and Evolution

Chapter-4: Principles of Inheritance and Variation

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; Sex determination - in humans, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Chapter-5: Molecular Basis of Inheritance

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; Genome, Human and rice genome projects; DNA fingerprinting.

Chapter-6: Evolution

Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution - variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy- Weinberg's principle; adaptive radiation; human evolution.

Unit-VIII: Biology and Human Welfare

Chapter-7: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, 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.

Chapter-8: Microbes in Human Welfare

Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

Unit-IX Biotechnology and its Applications

Chapter-9: Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Chapter-10: Biotechnology and its Applications

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, biopiracy and patents.

Unit-X Ecology and Environment

Chapter-11: Organisms and Populations

Population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution.

Chapter-12: Ecosystem

Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy.

Chapter-13: Biodiversity and its Conservation

Biodiversity-Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

PRACTICALS

Time allowed: 3 Hours

Max. Marks: 30

Evaluation Scheme		Marks
One Major Experiment	5	5
One Minor Experiment	2&3	4
Slide Preparation	1 & 4	5
Spotting		7
Practical Record + Viva Voce	(Credit to the student's	4
Investigatory Project and its	work over the academic session	5
Project Record + Viva Voce	may be given)	
Total		30

A. List of Experiments

- 1. Prepare a temporary mount to observe pollen germination.
- 2. Study the plant population density by quadrat method.
- 3. Study the plant population frequency by quadrat method.
- 4. Prepare a temporary mount of onion root tip to study mitosis.
- 5. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, banana etc.

B. Study and observe the following (Spotting):

- 1. Flowers adapted to pollination by different agencies (wind, insects, birds).
- 2. Pollen germination on stigma through a permanent slide or scanning electron micrograph.
- 3. Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
- 4. Meiosis in onion bud cell or grasshopper testis through permanent slides.
- 5. T.S. of blastula through permanent slides (Mammalian).
- 6. Mendelian inheritance using seeds of different colour/sizes of any plant.
- 7. Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness.
- 8. Controlled pollination emasculation, tagging and bagging.
- 9. Common disease causing organisms like *Ascaris, Entamoeba, Plasmodium*, any fungus causing ringworm through permanent slides, models or virtual images or specimens. Comment on symptoms of diseases that they cause.
- 10. Models specimens showing symbiotic association in lichens, root nodules of leguminous plants, and parasitic mode of nutrition shown by Cuscuta on host.
- 11. Flash cards / models showing examples of homologous and analogous organs.

Practical Examination for Visually Impaired Students of Classes XI and XII Evaluation Scheme

Time: 02 Hours

Max. Marks: 30

Торіс	Marks
Identification/Familiarity with the apparatus	5
Written test (Based on given / prescribed practicals)	10
Practical Records	5
Viva	10
Total	30

General Guidelines

- The practical examination will be of two-hour duration. A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.

- The written test will be of 30 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 15 practical skill based very short answer type questions. A student would be required to answer any 10 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question paper should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record at least five of the listed experiments as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills, precautions etc.
- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory / principle / concept, apparatus / materials / chemicals required, procedure, precautions, sources of error etc.

Class XII

A. Items for Identification/ familiarity with the apparatus for assessment in practicals (All experiments) Beaker, flask, petriplates, soil from different sites - sandy, clayey, loamy, small potted plants, aluminium foil, paint brush, test tubes, starch solution, iodine, ice cubes, Bunsen burner/spirit lamp/water bath, large flowers, Maize inflorescence, model of developmental stages highlighting morula and blastula of frog, beads/seeds of different shapes/size/texture Ascaris, Cactus/Opuntia (model).

B. List of Practicals

- 1. Study of flowers adapted to pollination by different agencies (wind, insects).
- 2. Identification of T.S of morula or blastula of frog (Model).
- 3. Study of Mendelian inheritance pattern using beads/seeds of different sizes/texture.
- 4. Preparation of pedigree charts of genetic traits such as rolling of tongue, colour blindness.
- 5. Study of emasculation, tagging and bagging by trying out an exercise on controlled pollination.

- 6. Identify common disease causing organisms like *Ascaris* (model) and learn some common symptoms of the disease that they cause.
- 7. Comment upon the morphological adaptations of plants found in xerophytic conditions.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

- 1. Biology, Class-XII, Published by NCERT.
- 2. Other related books and manuals brought out by NCERT (consider multimedia also).
- 3. Biology Supplementary Material (Revised). Available on CBSE website.

Question Paper Design (Theory) Class XII (2025 -26) Biology (044)

Competencies	Total
Demonstrate Knowledge and Understanding	50 %
Application of Knowledge / Concepts	30 %
Analyse, Evaluate and Create	20 %

Note:

- Typology of questions: VSA including MCQs, Assertion Reasoning type questions; SA; LA-I; LA-II; Source-based/ Case-based/ Passage-based/ Integrated assessment questions.
- An internal choice of approximately 33% would be provided.

Suggestive verbs for various competencies

- Demonstrate, Knowledge and Understanding State, name, list, identify, define, suggest, describe, outline, summarize, etc.
- Application of Knowledge/Concepts Calculate, illustrate, show, adapt, explain, distinguish, etc.
- Analyze, Evaluate and Create

Interpret, analyse, compare, contrast, examine, evaluate, discuss, construct, etc.

COURSE STRUCTURE CLASS XII THEORY

Time: 3 Hours

Total Marks: 70

S. No.	Title	Marks
1	Solutions	7
2	Electrochemistry	9
3	Chemical Kinetics	7
4	d -and f -Block Elements	7
5	Coordination Compounds 7	
6	Haloalkanes and Haloarenes	6
7	Alcohols, Phenols and Ethers	6
8	Aldehydes, Ketones and Carboxylic Acids	8
9	Amines	6
10	Biomolecules	7
	Total	70

Unit 1: Solutions

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapor pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor

Unit 2: Electrochemistry

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, 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, fuel cells, corrosion.

Unit 3: Chemical Kinetics

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.

Unit 4: d and f Block Elements

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 K₂Cr₂O₇ and KMnO₄.

Lanthanides - Electronic configuration, oxidation states, chemical reactivity and lanthanide contraction and its consequences.

Actinides - Electronic configuration, oxidation states and comparison with lanthanides

Unit 5: Coordination Compounds

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 stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).

Unit 6: Haloalkanes and Haloarenes

Haloalkanes: Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation mechanism of substitution reactions.

Haloarenes: Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Unit 7: Alcohols, Phenols and Ethers

Alcohols: 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. **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

Unit 8: Aldehydes, Ketones and Carboxylic Acids

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.

Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit 9: Amines

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. **Diazonium salts:** Preparation, chemical reactions and importance in synthetic organic chemistry.

Unit 10: Biomolecules

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

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.

Nucleic Acids: DNA and RNA.

PRACTICAL

Evaluation Scheme for Examination	Marks
Volumetric Analysis	08
Salt Analysis	08
Content Based Experiment	06
Project Work	04
Class record and viva	04
Total	30

PRACTICAL SYLLABUS

Micro-chemical methods are available for several of the practical experiments, wherever possible such techniques should be used.

A. Surface Chemistry

1. Preparation of one lyophilic and one lyophobic sol

Lyophilic sol - starch, egg albumin and gum

Lyophobic sol – aluminum hydroxide, ferric hydroxide, arsenous sulphide.

- 2. Dialysis of sol-prepared in (a) above.
- 3. Study of the role of emulsifying agents in stabilizing the emulsion of different oils.

B. Chemical Kinetics

- 1. Effect of concentration and temperature on the rate of reaction between Sodium Thiosulphate and Hydrochloric acid.
- 2. Study of reaction rates of any one of the following:
 - Reaction of lodide ion with Hydrogen Peroxide at room temperature using different concentration of lodide ions.
 - Reaction between Potassium lodate, (KIO₃) and Sodium Sulphate: (Na₂SO₃) using starch solution as indicator (clock reaction).

C. Thermochemistry

Any one of the following experiments

- Enthalpy of dissolution of Copper Sulphate or Potassium Nitrate.
- Enthalpy of neutralization of strong acid (HCI) and strong base (NaOH).
- Determination of enthalpy change during interaction (Hydrogen bond formation) between Acetone and Chloroform.

D. Electrochemistry

Variation of cell potential in $Zn/Zn^{2+}||Cu^{2+}/Cu$ with change in concentration of electrolytes (CuSO₄ or ZnSO₄) at room temperature.

E. Chromatography

- 1. Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values.
- 2. Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in Rf values to be provided).

F. Preparation of Inorganic Compounds

- 1. Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum.
- 2. Preparation of Potassium Ferric Oxalate.

G.Preparation of Organic Compounds

Preparation of any one of the following compounds

1. Acetanilide

- 2. Di -benzalAcetone
- 3. p-Nitroacetanilide
- 4. Aniline yellow or 2 Naphthol Aniline dye.

H. Tests for the functional groups present in organic compounds

Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.

- I. Characteristic tests of carbohydrates, fats and proteins in pure samples and their detection in given foodstuffs.
- J. Determination of concentration/ molarity of KMnO4 solution by titrating it against a standard solution of:
 - 1. Oxalic acid,
 - 2. Ferrous Ammonium Sulphate

(Students will be required to prepare standard solutions by weighing themselves).

K. Qualitative analysis

Determination of one anion and one cation in a given salt

Cations: $Pb^{2+}, Cu^{2+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+} Zn^{2+} Co^{2+} Ca^{2+}Sr^{2+} Ba^{2+} Mg^{2+}, NH_4^+$ Anions: $CO_3^{2-}, S^{2-}, SO_3^{2-}, NO_3^-, NO_2^-, Cl^-, Br^-, I^-, SO_4^{2-}, PO_4^{3-}, CH_3COO^-, C_2O_4^{2-}$ (Note: Insoluble salts excluded)

PROJECTS

Scientific investigations involving laboratory testing and collecting information from other sources.

A few suggested Projects

- a) Study of the presence of oxalate ions in guava fruit at different stages of ripening.
- b) Study of quantity of casein present in different samples of milk.
- c) Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- d) Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)
- e) Study of digestion of starch by salivary amylase and effect of pH and temperature on it.

- f) Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.
- g) Extraction of essential oils present in Saunf (aniseed), Ajwain (carom), Illaichi (cardamom).
- h) Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chili powder and pepper.

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of the teacher.

Practical Examination for Visually Challenged Learners Classes XI and XII

Evaluation Scheme	Marks
Identification/Familiarity with the apparatus	5
Written test (based on given/prescribed practical's)	10
Practical Record	5
Viva	10
Total	30

General Guidelines

- The practical examination will be of two-hour duration.
- A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes' duration.
- The question paper given to the students should be legibly typed. It should contain a total of 15 practical skill based very short answer type questions. A student would be required to answer any 10 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question papers should be related to the listed practicals
- Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record at least five of the listed experiments as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills, precautions etc.
- Questions may be generated jointly by the external/internal examiners and used

for assessment.

• The viva questions may include questions based on basic theory/principle/concept, apparatus/materials/ chemicals required, procedure, precautions, sources of error etc.

List of apparatus for identification/familiarity for assessment in practical (All experiments)

Beaker, glass rod, tripod stand, wire gauze, Bunsen burner, Whatman filter paper, gas jar, capillary tube, pestle and mortar, test tubes, tongs, test tube holder, test tube stand, burette, pipette, conical flask, standard flask, clamp stand, funnel, filter paper

Hands-on Assessment

- Identification/familiarity with the apparatus
- Odour detection in qualitative analysis

List of Experiments

The experiments have been divided into two sections: Section A and Section B. The experiments mentioned in Section B are mandatory.

SECTION A

A. Surface Chemistry

- 1. Preparation of one lyophilic and one lyophobic sol
 - i. Lyophilic sol starch, egg albumin and gum
 - ii.Lyophobic sol Ferric hydroxide

B. Chromatography

Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values (distance values may be provided).

C. Tests for the functional groups present in organic compounds

- 1. Alcoholic and Carboxylic groups
- 2. Aldehyde and Kenotic groups
- D. Characteristic tests of carbohydrates and proteins in the given foodstuffs.
- E. Preparation of Inorganic Compounds- Potash Alum

SECTION B (Mandatory)

F. Quantitative analysis

1. (a) Preparation of a given volume of the standard solution of Oxalic acid.

(b) Determination of molarity of KMnO₄ solution by titrating it against a standard solution of Oxalic acid.

2. The above exercise [F 1 (a) and (b)] to be conducted using Ferrous ammonium sulphate (Mohr's salt)

G. Qualitative Analysis

Determination of one anion and one cation in a given salt **Cation -** NH_4^+ **Anions:** CO_3^{2-} , S^{2-} , SO_3^{2-} , , CI^- , CH_3COO^- (Note: insoluble salts excluded)

Note: The above practical may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

- 1. Chemistry Part I, Class-XII, Published by NCERT.
- 2. Chemistry Part II, Class-XII, Published by NCERT.
- 3. Manual of Microscale Chemistry laboratory kit.

Links for NCERT textbooks:

- 1. https://ncert.nic.in/textbook.php?lech1=0-5
- 2. https://ncert.nic.in/textbook.php?lech2=0-5
- 3. <u>https://ncert.nic.in/division/dek/pdf/Manual_01.pdf</u>

QUESTION PAPER DESIGN CLASSES XI & XII

S.No	Domains	Total Marks	%
1	Remembering and Understanding: Exhibit memory of previously learned material by recalling facts, terms, basic concepts and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas.	28	40
2	Applying: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	21	30
3	Analysing, Evaluating and Creating: Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	21	30

- 1. No chapter wise weightage is provided, however, care to be taken to cover all the chapters.
- 2. Suitable internal variations may be made for generating various templates.
- 3. There will be no overall choice in the question paper.
- 4. However, 33% internal choices will be given in all the sections.

COMPUTER SCIENCE Subject Code – 083 Class XII (2025-26)

1. Prerequisites

Computer Science- Class XI

2. Learning Outcomes

Student should be able to

- a) apply the concept of function.
- **b)** explain and use the concept of file handling.
- c) use basic data structure: Stacks
- d) explain basics of computer networks.
- e) use Database concepts, SQL along with connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Marks
1	Computational Thinking and Programming — 2	40
2	Computer Networks	10
3	Database Management	20
	Total	70

4. Unit wise Syllabus

Unit 1: Computational Thinking and Programming – 2

- Revision of Python topics covered in Class XI.
- Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Exception Handling: Introduction, handling exceptions using try-except-finally blocks
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths

- Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file
- Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
- CSV file: import csv module, open / close csv file, write into a csv file using writer(),writerow(),writerows() and read from a csv file using reader()
- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit 2: Computer Networks

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Unit 3: Database Management

- Database concepts: introduction to database concepts and its need
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, 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 connect(), cursor(), execute(), commit(), fetchone(), fetchall(), rowcount, creating database connectivity applications, use of %s format specifier or format() to perform queries

5. Practical

S.No	Unit Name	Marks (Total=30)
1	Lab Test: 1. Python program (60% logic + 20% documentation + 20% code quality)	8
	SQL queries (4 queries based on one or two tables)	4
2	 Report file: Minimum 15 Python programs. SQL Queries – Minimum 5 sets using one table / two tables. Minimum 4 programs based on Python – SQL connectivity 	7
3	Project (using concepts learnt in Classes 11 and 12)	8
4	Viva voce	3

6. Suggested Practical List:

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.
- Remove all the lines that contain the character 'a' in a file and write it to another file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Write a Python program to implement a stack using list.
- Create a CSV file by entering user-id and password, read and search the password for given userid.

Database Management

• Create a student table and insert data. Implement the following SQL commands on the student table:

o ALTER table to add new attributes / modify data type / drop attribute

o UPDATE table to modify data

o ORDER By to display data in ascending / descending order

o DELETE to remove tuple(s)

o GROUP BY and find the min, max, sum, count and average

- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

7. Suggested Reading Material

- NCERT Textbook for COMPUTER SCIENCE (Class XII)
- Support Materials on the CBSE website.

8. Project

The aim of the class project is to create something that is tangible and useful using Python file handling/ Python-SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world problem that is worthwhile to solve.

Students are encouraged to visit local businesses and ask them about the problems that they are facing. For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts for the GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, of course to do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves.

The students should be sensitized to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.

ENGLISH CORE QUESTION PAPER DESIGN CLASS-XI (2025-26)

Section	Competencies	Total marks
Reading Skills	Conceptual understanding, decoding, Analyzing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarizing and using appropriate format/s.	26
Grammar and Creative Writing Skills	Conceptual Understanding, application of rules, Analysis, Reasoning, appropriate style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity.	23
Literature Text Book and Supplementary Reading Text	Recalling, reasoning, appreciating literary convention, inference, analysis, creativity with fluency, Critical Thinking.	31
	TOTAL	80
Internal Assessment	Assessment of Listening and Speaking Skills Listening Speaking Project Work 	10 5+5 10
	GRAND TOTAL	100

ENGLISH CORE CLASS – XII (2025-26)

Section A Reading Skills-22 Marks

I. Reading Comprehension through Unseen Passage

12+10 = 22 Marks

- 1. One unseen passage to assess comprehension, interpretation, analysis and inference. Vocabulary assessment will also be assessed via inference. The passage may be factual, descriptive or literary.
- 2. One unseen **case-based factual** passage with verbal/visual inputs like statistical data, charts etc. to assess comprehension, interpretation, analysis, inference and evaluation.

Note: The combined word limit for both the passages will be 700-750 words.

Multiple Choice Questions / Objective Type Questions and Short Answer Type Questions (to be answered in 40-50 words) will be asked.

Section B

Creative Writing Skills-18 Marks

- **3.** Notice, up to 50 words. One out of the two given questions to be answered. **(4 Marks**: Format :1 / Content: 2 / Accuracy of Spelling and Grammar: 1).
- Formal/Informal Invitation and Reply, up to 50 words. One out of the two given questions to be answered. (4 Marks: Format: 1 / Content: 2 / Accuracy of Spelling and Grammar :1).
- 5. Letters based on verbal/visual input, to be answered in approximately 120-150 words. Letter types include application for a job with bio data or resume. Letters to the editor (giving suggestions or opinion on issues of public interest). One out of the two given questions to be answered. (5 Marks: Format: 1/Organisation of Ideas:1/Content:2/ Accuracy of Spelling and Grammar :1).
- Article/ Report Writing, descriptive and analytical in nature, based on verbal inputs, to be answered in 120-150 words. One out of the two given questions to be answered. (5 Marks:Format:1/Organisation of Ideas:1/Content:2/Accuracy of Spelling and Grammar:1).

Section C

Literature Text Book and Supplementary Reading Text- 40 Marks

This section will have variety of assessment items including Multiple Choice Questions, Objective Type Questions, Short Answer Type Questions and Long Answer Type Questions to assess comprehension, interpretation, analysis, evaluation and extrapolation beyond the text.

- 7. One Poetry extract out of two, from the book Flamingo, to assess comprehension, interpretation, analysis, inference and appreciation. (6x1=6 Marks)
- 8. One Prose extract out of two, from the book Vistas, to assess comprehension, interpretation, analysis, evaluation and appreciation.
 (4x1=4 Marks)
- 9. One prose extract out of two from the book Flamingo, to assess comprehension, interpretation, analysis, inference and evaluation. (6x1=6Marks)
- Short answer type questions (from Prose and Poetry from the book Flamingo), to be answered in 40-50 words each. Questions should elicit inferential responses through critical thinking. Five questions out of the six given, are to be answered. (5x2=10 Marks)
- Short answer type questions, from Prose (Vistas), to be answered in 40- 50 words each. Questions should elicit inferential responses through critical thinking. Any two out of three questions to be done. (2x2=4 Marks)
- 12. One Long answer type question, from Prose/Poetry (Flamingo), to be answered in 120-150 words. Questions can be based on incident / theme / passage / extract / event as reference points to assess extrapolation beyond and across the text. The question will elicit analytical and evaluative response from the student. Any one out of two questions to be done. (1x5=5 Marks)
- One Long answer type question, based on the chapters from the book Vistas, to be answered in 120-150 words, to assess global comprehension and extrapolation beyond the text. Questions to provide analytical and evaluative responses using incidents, events, themes, as reference points. Any one out of two questions to be done. (1x5=5 Marks)

Prescribed Books

1. Flamingo: English Reader published by National Council of Education Research and Training, New Delhi

Prose

- The Last Lesson •
- Lost Spring
- Deep Water
- The Rattrap
- Indigo
- Poets and Pancakes
- The Interview
- Going Places

Poetry

- My Mother at Sixty-Six
- Keeping Quiet
- A Thing of Beauty
- A Roadside Stand
- Aunt Jennifer's Tigers
- 2. Vistas: Supplementary Reader published by National Council of Education Research and Training, New Delhi
 - The Third Level
 - The Tiger King
 - Journey to the End of the Earth
 - The Enemy
 - On the Face of It
 - Memories of Childhood •
 - The Cutting of My Long Hair
 - We Too are Human Beings

INTERNAL ASSESSMENT

Assessment of Listening Skills Assessment of Speaking Skills - 05 Marks Project Work

- 05 marks.

 - 10 Marks

ENGLISH CORE QUESTION PAPER DESIGN CLASS- XII (2025-26)

Section	Competencies	Total marks
Reading Skills	Conceptual understanding, decoding, Analyzing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarizing and using appropriate format/s.	22
Creative Writing Sills	Conceptual Understanding, application of rules, Analysis, Reasoning, appropriate style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity.	18
Literature Text Book and Supplementa ry Reading Text	Recalling, reasoning, critical thinking, appreciating literary convention, inference, analysis, creativity with fluency.	40
	TOTAL	80
Internal Assessment	Assessment of Listening and Speaking Skills	10
	ListeningSpeaking	5+5
	Project Work	10
	GRAND TOTAL	100

GUIDELINES FOR INTERNAL ASSESSMENT

Classes XI-XII

Total Marks: 20

ALS must be seen as an integrated component of all four language skills rather than a compartment of two. Suggested activities, therefore, take into consideration an integration of the four language skills but during assessment, emphasis will be given to speaking and listening, since reading and writing are already being assessed in the written exam.

Assessment of Listening and Speaking Skills: (5+5=10 Marks)

i. Activities:

- Subject teachers must refer to books prescribed in the syllabus.
- In addition to the above, teachers may plan their own activities and create their own material for assessing the listening and speaking skills.
- ii. **Parameters for Assessment:** The listening and speaking skills are to be assessed on the following parameters:
 - a. Interactive competence (Initiation & turn taking, relevance to the topic)
 - b. Fluency (cohesion, coherence and speed of delivery)
 - c. Pronunciation
 - d. Language (grammar and vocabulary)

SUGGESTIVE RUBRICS

	1	2	3	4	5
Interaction	 Contributions are mainly unrelated to those of other speakers Shows hardly any initiative in the development of conversation Very limited interaction 	 Contributions are often unrelated to those of the other speaker Generally passive in the development of conversation 	 Develops interaction adequately, makes however minimal effort to initiate conversation Needs constant prompting to take turns 	 Interaction is adequately initiated and developed Takes turn but needs some prompting 	 Initiates & logically develops simple conversation on familiar topics Takes turns appropriately
Fluency &	Noticeably/ long pauses:	 Usually fluent: 	 Is willing to speak at 	 Speaks without 	 Speaks fluently
Concrence	rate of	produces	length,	noticeable	almost with
	speech is slow	simple speech	however repetition is	effort, with a little repetition	no repetition & minimal

	 Frequent repetition and/or self- correction this is all right in informal conversation Links only basic sentences; breakdown of coherence evident 	fluently, but loses coherence in complex communicati on • Often hesitates and/or resorts to slow speech • Topics partly developed; not always concluded logically	noticeable • Hesitates and/or self corrects; occasionally loses coherence • Topics developed, but usually not logically concluded	 Demonstrates hesitation to find words or use correct grammatical structures and/or self- correction Topics not fully developed to merit. 	hesitation Develops topic fully & coherently
Pronunciation	 Frequent inaccurat e pronunci ation Commun ication is severely affected 	 Frequently unintelligible articulation Frequent phonological errors Major communicati on problems 	Largely correct pronunciatio n &clear articulation except occasional errors	 Mostly correct pronunciation & clear articulation Is clearly understood most of the time;very few phonological errors 	 Pronounces correctly & articulates clearly Is always comprehensi ble uses appropriate intonation
Vocabulary & Grammar	 Demonstrate s almost no flexibility, and mostly struggles for appropriate words Many Grammatical errors impacting communicati on 	 Is able to communicate on some of the topics, with limited vocabulary. Frequent errors, but self- corrects 	 Is able to communicate on most of the topics, with limited vocabulary. A few grammatical errors 	 Is able to communicate on most of the topics with appropriate vocabulary Minor errors that do not hamper communicati on 	 Is able to communicat e on most of the topics using a wide range of appropriate vocabulary, using new words and expression No grammatical errors

iii. Schedule:

- The practice of listening and speaking skills should be done throughout the academic year.
- The final assessment of the skills is to be done as per the convenience and schedule of the school.

Out of ten marks, 5 marks will be allotted for the project report/script /essay etc. and 5 marks for the viva

I. Schedule:

- Schools may refer to the suggestive timeline given in these guidelines for the planning, preparation and viva-voce of ALS based projects.
- The final assessment of the skills may be done on the basis of parameters suggested by the Board. Language teachers, however, have the option to adopt/ modify these parameters according to their school specific requirements.

II. Suggestions for Project Work:

- The Project can be inter-disciplinary in theme. The ideas/issues highlighted in the chapters/ poems/ drama given the prescribed books can also be developed in the form of a project. Students can also take up any relevant and age-appropriate theme.
- Such topics may be taken up that provide students with opportunities for listening and speaking. Some suggestions are as follows:

a) Interview-Based research:

Example:

- Students can choose a topic on which to do their research/ interview, e.g. a student can choose the topic: "Evolving food tastes in my neighbourhood" or "Corona pandemic and the fallout on families." Read the available literature.
- The student then conducts interviews with a few neighbours on the topic. For an interview, with the help of the teacher, student will frame questions based on the preliminary research/background.
- The student will then write an essay/ write up / report etc. up to 1000 words on his/her research and submit it. He/ She will then take a viva on the research project. The project can be done in individually or in pairs/ groups
- **b)** Students listen to podcasts/ interviews/radio or TV documentary on a topic and prepare a report countering or agreeing with the speakers. Write an 800 1000 words report and submit. Take a viva on the report.
- c) Students create their own video/ Audio, after writing a script. Before they decide a format, the following elements can be taken into consideration:
- Theme/topic of the audio / video. Would the child like to pick a current issue or something artistic like theatre?
- What are the elements that need to be part of the script?
- Will the video/audio have an interview with one or more guests?

- Would they prefer to improvise while chatting with guests, or work from a script?
- What would be the duration?
- How would they present the script/report to the teacher? Can it be in the form of a narrative?

d) Students write, direct and present a theatrical production, /One act play

This will be a project which will be done as a team. It will involve planning, preparation and presentation. In short, various language skills will be utilised. There will be researching, discussion, writing the script, auditioning and ultimately producing the play. The project will end with a presentation and subsequently a viva. Teachers will be able to assess the core language skills of the students and help them grow as 21st Century critical thinkers.

II. Instructions for the Teachers: -

- 1. Properly orient students about the Project work, as per the present Guidelines.
- 2. Facilitate the students in the selection of theme and topic.
- 3. Create a rubric for assessment and share with the students before they start so that they know the parameters of assessment:
 - Teachers need to familiarize themselves with the method of assessing students with the <u>rubric</u>-- a table with different criteria and a grading scale.
 - Choose the criteria on which you will grade students and list them along the left side of the page.
 - Create an even number of columns along the top of the page. These columns will represent potential skill levels of the students.
 - Assessing students on four/five criteria is an easy way to begin. For each criterion, define the ability that student would exhibit at each of the levels.
 - The more detailed you make your criteria, the easier it will be to evaluate each student and define the level at which the student is presenting.
 {Sample Rubric is attached at the end for reference}

III. Parameters for Overall Assessment: -

1. Pronunciation:

- When evaluating the pronunciation of the students, teachers must listen for clearly articulated words, pronunciation of unusual spellings and intonation.
- Assess the students for the pronunciation skills and determine at which level the student needs improvement.

2. Vocabulary:

After noting their pronunciation levels, evaluate the students on the use of extensive and appropriate **vocabulary** during the viva. Check if students are using vocabulary appropriate to the context about which they are speaking.

3. Accuracy:

Grammar has always been an important component of language skills. As students speak/ answer the questions during the viva, listen to their **grammatical structures**. Are they competent enough to use multiple tenses? Is their word order correct in a given sentence? An effective speaker will automatically use the correct grammatical structures of his language.

4. Communication:

Assessing the **communication skills** of the students means looking at more than language. Look at how creatively students use the language to make their points understood. Students with a low level of vocabulary and grammar may still have good communication skills if they are able to make the teacher understand their point of view.

5. Interaction:

- During the viva teachers need to ask the students some questions. Questions need to be based on the projects that have been suggested or chosen by the students.
- It is imperative for a teacher to read the essays/project reports before they can be ready to ask questions.
- Teachers need to observe how students answer the questions that are posed to them: Are they able to understand and answer questions independently or can they answer only when the questions are translated into simpler words or repeated? Are they able to give appropriate responses in a conversation?
- These elements of **interaction** are necessary for clear and effective communication. A student with effective interaction skills will be able to answer questions with relative ease and follow the flow of conversation.

6. Fluency:

- Fluency may be the easiest quality to judge in the students' speech: How comfortable are they as they speak and express themselves? How easily do the words come out? Are there inappropriate pauses and gaps in the way a student speaks?
- **Fluency** is a judgement of this communication and is an important criterion when evaluating speaking skills. These criteria: pronunciation, vocabulary, accuracy, interaction and fluency are all the hallmarks of a student's overall speaking abilities.
- Teachers must also remember that some **students may excel in one area and struggle in another**. Helping the students understand these issues will enable them to become effective speakers in future. Let your students know that you will be assessing them in these various areas when you evaluate their progress and encourage them to work and improve in these areas.
- **Finally,** teachers must remember that a proper evaluation of the students will take into consideration **more than just one oral interview on the final ASL** project. Teachers must take note of a student's progress throughout the academic year.

IV. Project-Portfolio/ Project Report

The **Project-Portfolio/Project Report** is a compilation of the work that the students produce during the process of working on their ALS Project.

The Project-Portfolio may include the following:

- Cover page, with title of project, school details/details of students.
- Statement of purpose/objectives/goals
- Certificate of completion under the guidance of the teacher.
- Students Action Plan for the completion of assigned tasks.
- Materials such as scripts for the theatre/role play, questionnaires for interview, written assignments, essays, survey-reports and other material evidence of learning progress and academic accomplishment.
- The 800-1000 words essay/Script/Report.
- Student/group reflections.
- If possible, Photographs that capture the positive learning experiences of the student(s).
- List of resources/bibliography

The following points must be kept for consideration while assessing the project portfolios:

- Quality of content of the project
- Accuracy of information
- Adherence to the specified timeline
- Content in respect of (spellings, grammar, punctuation)
- Clarity of thoughts and ideas
- Creativity
- Contributions by group members
- Knowledge and experience gained

V. Suggestive Timeline:

The FIVE Steps in Project Plan



Month	Objectives
Planning and Research for the Project Work Preferably till November- December	 Teachers plan a day to orient students about the ALS projects, details are shared with all stakeholders. Students choose a project, select team members and develop project- plan. Group meets (preferably online) and reports to the team leader about the progress: shortfalls and successes are detailed. Team leader apprises teacher-mentor. Students working individually or in pairs also update the teachers. A logical, deliverable and practical plan is drafted by the team/ pair/individual. Goals/objectives are clearly defined for all. Work is delegated to team members by the team leader. Students wishing to work alone develop their own plan of Action. Detailed project schedules are shared with the teacher
December- January	 Suggestions and improvements are shared by the teacher, wherever necessary. Group members coordinate and keep communication channels open for interaction. Gaps (if any) are filled with the right skill sets by the Team Leader/ individual student. The final draft of the project portfolio/ report is prepared and submitted for evaluation.
January-February	 Students are assessed on their group/pair/individual presentations on allotted days. Final Viva is conducted by the External/Internal examiner.
February-March or as per the timelines given by the Board	Marks are uploaded on the CBSE website.

SAMPLE RUBRIC FOR ALS Project Work (For Theatre/Role Play/Oral presentation/ Interview/ Podcast)

CATEGORY	1	2	3	4	5
TIME LIMIT	Presentation is less than or more than 5 minutes long	Presentation exceeded or less than specified time limit by 4 to 5 minutes	Presentation exceeded or less than specified time limit by 3 to 4 minutes	Presentation exceeded or less than specified time limit by 2 to 3 mins	Student/ group adhered to the given time limit
CONTENT/ SCRIPT/ QUESTIONNAIRE	Script is not related to topic or issue	Well written script/content shows little understanding of parts of topic	Well written script/content shows good understanding of parts of topic	Well written script/content shows a good understanding of subject topic	Well written script/content shows full understanding of subject topic
CREATIVITY	No props/ costumes/ stage presentation lack-lustre	Some work done, average stage set-up and costumes	Well organized presentation, could have improved	Logical use of props, reasonable work done, creative	Suitable props /effort seen/ considerable work done/ Creative and relevant costumes
PREPAREDNESS	Student/ group seems to be unprepared	Some visible preparedness but Rehearsal is lacking	Somewhat prepared, rehearsal is lacking	Good preparedness but need better rehearsal	Complete Preparedness /rehearsed presentation
CLARITY OF SPEECH	Lack of clarity in presentation many words mis- pronounced	Speaks clearly some words are mis- pronounced	Speaks clearly 90% of the time/ a few mis- pronounced words	Speaks clearly and distinctly 95% of time/ Few mis- pronounced words	Speaks clearly distinctly 95% of time/ fluency in pronunciation
USE OF PROPS (Theatre/Role Play)	Only 1/no relevant props used Very little use of facial expressions /body language, Does not generate much interest	1 to 2 relevant props used Little Use of facial expressions and body language	2 to 3 relevant props used Facial expressions and body language is used to try to generate some enthusiasm	3 to 4 relevant props used Facial expression and body language sometimes generate enthusiasm with the topic	4 to 5 relevant props used Facial expression and body language generate enthusiasm with the topic
PORTFOLIO- PRESENTATION	Inadequate & unimpressive	Somewhat suitable & convincing	Adequate & relevant	Interesting, enjoyable & relevant	Brilliant, creative& exceptional

Physical Education (Subject Code 048)

Class XII (2025-26)

UNIT NO.	UNIT NAME	THE WEIGHTAGE (MARKS) ALLOTTED
UNIT 1	Management of Sporting Events	05 + 04 b *
UNIT 2	Children and Women in Sports	07
UNIT 3	Yoga as Preventive measure for Lifestyle Disease	06+01 b *
UNIT 4	Physical Education & Sports for (CWSN)	04+04 b *
UNIT 5	Sports & Nutrition	07
UNIT 6	Test and Measurement in Sports	08
UNIT 7	Physiology & Injuries in Sport	04+04 b *
UNIT 8	Biomechanics and Sports	10
UNIT 9	Psychology and Sports	07
UNIT 10	Training in Sports	09
PRACTICAL	Including 3 Practical	30
(LAB) [#]		
TOTAL	Theory 10 + Practical 3	Theory 70 + Practical 30 = 100
Note: b*are the base study for	Concept based questions like Tactile diag visually Impaired Child	ram/data interpretation/case

CLASS XII

COURSE CONTENT

Unit No.	Unit Name & Topics	Specific Learning Objectives	Suggested Teaching Learning process	Learning Outcomes with specific competencies
Unit	Management of	To make the	Lecture-based	After completing
1	Sporting Events	students	instruction,	the unit, the
	1. Functions of	understand the	Technology-	students will be
	Sports Events	need and meaning	based	able to:
	 Sports Events Management (Planning, Organising, Staffing, Directing & Controlling) Various Committees & their Responsibiliti es (pre; during & post) Fixtures and their Procedures – Knock- Out (Bye & Seeding) & League (Staircase, Cyclic, 	 need and meaning of planning in sports, committees, and their responsibilities for conducting the sports event or tournament. To teach them about the different types of tournaments and the detailed procedure of drawing fixtures for Knock Out, League Tournaments, and Combination tournaments. To make the 	 based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning. 	 able to: * Describe the functions of Sports Event management * Classify the committees and their responsibilities in the sports event * Differentiate the different types of tournaments. * Prepare fixtures
	 Cyclic, Tabular method) and Combination tournaments Intramural & Extramural tournaments – Meaning, Objectives & Its Significance Community sports program (Sports Day, Health Run, Run for Fun, Run for Fun, Run for Specific Cause & Run for 	 To make the students understand the need for the meaning and significance of intramural and extramural tournaments To teach them about the different types of community sports and their importance in our society. 		 Prepare fixtures of knockout, league & combination. Distinguish between intramural and extramural sports events Design and prepare different types of community

Unit	Children &		To make students			Lecture-based	After completing								
2	Women in			understand the		instruction,	th	e unit, the							
	Sports			exercise quidelines	•	Technology-	st	udents will be							
	1.	Exercise	•	•	•	•	•			of WHO for different		based learning,	ab	le to:	
		WHO for						age groups	•	Group learning,	•	Differentiate			
		different age						•				•	Individual		exercise
		groups.							To make students		learning,		guidelines for		
								awara of the	•	Inquiry-based	different stages	different stages			
	2.	Common				Kinesthetic	of growth and	of growth and							
		postural		deformition	•	learning		development.							
		knock knees		ueioinniiles	•	Game-based	•	Classifv common							
		flat foot.			•	learning and		postural							
		round	•	To make students	•	Expeditionary		deformities and							
		shoulders,		aware of women's		learning		identify							
		Lordosis,		sports participation				corrective							
		Kyphosis,		in India and about				measures.							
		bow leas and		the special			•	Recognize the							
		their		conditions of				role and							
		respective		women				importance of							
		corrective						sports							
		measures.	•	To make students				participation of							
			•	understand				women in India.							
	3.	Women's		menarche and			•	Identify special							
		participation		menstrual				considerations							
		in Sports-		dysfunction among				relate to							
		Physical,		women athletes.				menarche and							
		and social						menstrual							
		benefits.	•	To make them				dysfunction.							
				understand about			•	Express female							
	Л	Special		female athlete triad.				athlete triad							
	4.	consideration						according to							
		(menarche						eating disorders							
		and													
		menstrual													
		dysfunction)													
	5.	Female													
		athlete triad													
		(osteoporosis,													
		eating													
		disorders													

Unit	Yoga as	• To	make students	•	Lecture-based	Af	ter completing
3	Preventive		derstand about		instruction,	the	e unit, the
	measure for	th	o main lifo stylo	•	Technology-	stı	udents will be
	Lifestvle	dia			based learning,	ab	le to:
	Disease		sease - Obesily,	•	Group learning,	*	Identify the
			/pertension,	•	Individual		asanas beneficial
	1. Obesity:		abeles, back		learning,		for different
	Procedure	Pa	ain and Asinma.	•	Inquiry-based		ailments and
	Renefits &	• To	teach about		learning,		health problems
	Contraindicati	dif	ferent Asanas	•	Kinesthetic		nealth problems.
	one for	in	detail which		learning,	*	Pocognizo
	Tadasana	ca	in help as a	•	Game-based		importance of
	Tauasana, Katiabakrasan	pr	eventive		learning and		
	Rationakiasan	M	easures for	•	Expeditionary		for proventive
	a, Deverencedates	the	ose Lifestyle		learning.		
	Pavanmuklas	Di	seases.				measures of
	ana,						obesity,
	Matsayasana,						diabetes,
	Halasana,						astnma,
	Pachimottans						nypertension,
	ana, Ardna –						back pain and
	Matsyendrasa						arthritis
	na,						
	Dhanurasana,					*	Describe the
	Ushtrasana,						procedure for
	Suryabedhan						variety of asanas
	pranayama						for maximal
	2. Diabetes:						bonofite
	Procedure,					*	Distinguish the
	Benefits &						contraindications
	Contraindicati						associated with
	ons for						norforming
	Katichakrasan						difforent asanas
	a,					*	Outline the role
	Pavanmuktas						of yogic
	ana,Bh						management for
	ujangasana,						various hoalth
	Shalabhasana						hanafite and
	,Dhanurasana						proventive
	Supta-						preventive
	vajarasana,						1115030153.
	Paschimottan						
	asan-a,						
	Ardha-						
	Mastendrasan						
	a,						
	Mandukasana						
	,						

	Gomukasana		
	Voqmudra		
	Lobtrocono		
	Ushtrasana,		
	Kapalabhati		
3	∆sthma [.]		
5.	Astrina. Procoduro		
	Procedure,		
	Contraindicat		
	ions for		
	Tadasana,		
	Urdhwahasto		
	ttansan		
	a,		
	UttanManduk		
	asan-		
	a		
	a, Bhuiangasana		
	Dhujanyasana		
	, Dhannar		
	Dhanurasana,		
	Ushtrasana,		
	Vakrasana,		
	Kapalbhati,		
	Gomukhasana		
	Matsyaasana,		
	Anuloma-		
	Viloma		
4.	Hypertension		
	• Procedure		
	Renefits &		
	Contraindicati		
	contraindicati		
	Tadasana,		
	Katichakransa		
	n,		
	Uttanpadasan		
	a, Ardha		
	Halasana,		
	Sarala		
	Matyasana,		
	Gomukhasana		
	, UttanManduka		
	ean-a		
	Jan-a,		
	Vakroone		
	Vakrasana,		
	Vakrasana, Bhujangasana		
	Vakrasana, Bhujangasana , Makarasana,		

Nadi-		
shodhana	apran	
ayam,		
Sitliprana	iyam	
5. Back Pa	in	
and		
Arthritis	:	
Procedu	re,	
Benefits	&	
Contraine	dica	
tions of		
Tadasan	,	
Urdhawa	hast	
ootansan	a,	
Ardh-		
Chakrasa	ana,	
Ushtrasa	na,	
Vakrasar	na,	
Sarala		
Maysyen	drsa	
na,		
Bhujanga	asan	
a,		
Gomukha	asan	
a,		
Bhadrasa	ana,	
Makaras	ana,	
Nadi-		
Shodhan	а	
pranayar	na.	

Unit	Physical	•	To make students		Lecture-based	Af	ter completing
4	Education and		understand the		instruction,	th	e unit, the
	Sports for		concept of	•	Technology-	st	udents will be
	CWSN		Disability and		based learning,	ab	le to:
	(Children with		Disorder	•	Group learning,	*	Value the
	Special Needs			•	Individual		advantages of
	- Divvang)				learning,		physical activities
	1 Organization	•	To teach	•	Inquiry-based		for children with
	s promoting		students about		learning,		special needs
	Disability		the types of	•	Kinesthetic		
	Sports		disabilities &		learning,	*	Differentiate
	(Special		disorders, their	•	Game-based		between
	Olympics:		causes, and		learning and		methods of
	Paralympis:		their nature.	•	Expeditionary		categorization in
	Deaflympics)				learning		sports for CWSN
	Deallympics)	•	To make them				
	2 Concept of		aware of			*	Understand
	2. Concept of		Disability				concents and
	Classificatio		Etiquette.				the importance
	Divisioning		•				of inclusion in
	in Sports						sports
	in opons.	•	To make the				oporto
			students			*	Create
	3. Concept of		Understand the				advantages for
	Inclusion in		advantage of				Children with
	sports, its		physical activity				Special Needs
	need, and		for CWSN.				through Physical
	Implementat						Activities
	ion;	•	To make the				
			students aware of			*	Strategies
			different strategies				physical activities
	4. Advantages		for making				accessible for
	of Physical		physical activity				children with
	Activities for		accessible for				specialneeds
	children with		Children with				
	special		Special Needs				
	needs.		·				
	5. Strategies to						
	make						
	Physical						
	Activities						
	assessable						
	for children						
	with special						
	needs.						

Unit 5	Sports & Nutrition	• To make the	Lecture-based instruction	After completing
5	 Nutrition Concept of balanced diet and nutrition Macro and Micro Nutrients: Food sources & functions Nutritive & Non- Nutritive Componen ts of Diet Eating for Weight control – A Healthy Weight, The Pitfalls of Dieting, Food Intolerance, and Food Myths Importance of Diet in Sports- Pre, During and Post competition Requirements 	 students understand the importance of a balanced diet To clear the concept of Nutrition – Micro & Macro nutrients, Nutritive & non- Nutritive Components of diet To make them aware of eating for weight loss and the results of the pitfalls of dieting. To understand food intolerance & food myths 	 instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning and Expeditionary learning. 	 the unit, the students will be able to: * Understand the concept of a balanced diet and nutrition. Classify Nutritive and Non- Nutritive components of the Diet * Identify the ways to maintain a healthy weight * Know about foods commonly causing food intolerance * Recognize the pitfalls of dieting and food myths
Unit 6	Test & Measurement in Sports 1. Fitness Test – SAI Khelo India Fitness Test in school:	To make students Understand and conduct SAI KHELO INDIA Fitness Test and to make students Understand and conduct General MotorFitness Test	 Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kiposthatia 	After completing the unit, the students will be able to: * Perform SAI Khelo India Fitness Test in school [Age

Age group 5-8	•	To make students	learning,		years/ (class 1-
vears/ class		to determine	Game-based		3) and Age
1-3 [.] BMI		nhysical fitness	learning and		aroup 9-18vrs/
Flamingo		Index through	Expeditionary		(class 1-12)
Polonoo Toot			learning		(01033 + 12)
Dalarice rest,		Tarvalu Step	loanning	*	Determine
				~	Determine
Test		Test			physical fitness
					Index through
Age group 9-	•	To make			Harvard Step
18yrs/ class 4-12:		students to			Test/Rock- port
BMI, 50mt Speed		calculate Basal			Test
		Metabolic Rate			
Run/Walk, Sit &		(BMR)		*	Compute
tost Strongth		(2000)			Basal
Test (Partial					Metabolic Rate
Abdominal Curl	•	To measure the			(BMR)
Up. Push-Ups for		fitness level of			
boys, Modified		Senior Citizens			
Push-Ups for		through Rikli and		*	Describe the
girls).		Jones Senior			procedure of
		Citizen Fitness			Rikli and
2. Measurement		Test.			Jones - Senior
of Cardio-					Citizen Fitness
Vascular					
Fitness –					1631
Harvard Step					
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					
Citizon					
CillZell Eitnoon Toot					
I est for lower					
body strength					
• Arm Curl Test					
for upper body					
strength				1	

	0	Chair Sit &						
		Reach Test						
		for lower body						
		flexibility						
	0	Back Scratch						
		Test for upper						
		body flexibility						
	0	Fight Foot Up						
	Ŭ	& Go Test for						
		adility						
	0	Six-Minute						
	Ŭ	Walk Test for						
		Endurance						
	5							
	5.	Mothpoy Tost						
		of Motor						
		UI WUUUU						
		Hall-Turn,						
		turn						
11							•	<u>()</u>
Unit	Pł	nysiology &	•	Understanding the	•	Lecture-based	A	fter completing
Unit 7	Pł In	nysiology & juries in Sport	•	Understanding the physiological	•	Lecture-based instruction,	A th	fter completing ne unit, the
Unit 7	Pł In	nysiology & juries in Sport	•	Understanding the physiological factors	•	Lecture-based instruction, Technology-	A th st	fter completing ne unit, the tudents will be
Unit 7	Pł In 1.	iysiology & juries in Sport Physiological	•	Understanding the physiological factors determining the	•	Lecture-based instruction, Technology- based learning,	A th st al	fter completing ne unit, the tudents will be ble to:
Unit 7	Př In 1.	iysiology & juries in Sport Physiological factors	•	Understanding the physiological factors determining the components of	•	Lecture-based instruction, Technology- based learning, Group learning,	A th st al	fter completing ne unit, the tudents will be ble to: Recognize the
Unit 7	Pł In 1.	ysiology & juries in Sport Physiological factors determining	•	Understanding the physiological factors determining the components of physical fitness.	•	Lecture-based instruction, Technology- based learning, Group learning, Individual	A th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological
Unit 7	Pł In 1.	Physiology & puries in Sport Physiological factors determining components	•	Understanding the physiological factors determining the components of physical fitness.	•	Lecture-based instruction, Technology- based learning, Group learning, Individual learning,	A th st al	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors
Unit 7	Př In 1.	Physiology & puries in Sport Physiological factors determining components of physical	•	Understanding the physiological factors determining the components of physical fitness.	•	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based	A th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the
Unit 7	Př In 1.	Physiology & puries in Sport Physiological factors determining components of physical fitness	•	Understanding the physiological factors determining the components of physical fitness.	• • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning,	A ^r th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components
Unit 7	Pr In 1.	Physiology & puries in Sport Physiological factors determining components of physical fitness	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of	• • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic	A ^t th st al	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical
Unit 7	Př In 1. 2.	Physiology & juries in Sport Physiological factors determining components of physical fitness Effect of	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular custom	• • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning,	A ¹ th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness.
Unit 7	Pł In 1. 2.	Physiology & juries in Sport Physiological factors determining components of physical fitness Effect of exercise on	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system.	• • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based	A ¹ th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness.
Unit 7	Pł In 1.	Physiology & puries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system.	• • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and	A [*] th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness.
Unit 7	Pł In 1.	Physiology & juries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system.	• • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary	A [*] th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of
Unit 7	Př In 1. 2.	Physiology & juries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of	• • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	A th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the
Unit 7	Pr In 1. 2.	Physiology & puries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on	• • • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	A' th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system
Unit 7	Př In 1. 2. 3.	Physiology & juries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular	• • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	A th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and
Unit 7	Pr In 1. 2. 3.	Physiology & puries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on the Cardio-	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular system.	• • • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	At th st at *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and cardiorespiratory
Unit 7	Pr In 1. 2. 3.	Physiology & puries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on the Cardio- Respiratory	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular system.	• • • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	A th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems.
Unit 7	Př In 1. 2. 3.	Physiology & juries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on the Cardio- Respiratory System	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular system. Learning the	• • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	A th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems.
Unit 7	Pr In 1. 2. 3.	Physiology & puries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on the Cardio- Respiratory System Physiological	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular system. Learning the effects of	• • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	At th st at *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems.
Unit 7	Pr In 1. 2. 3.	Physiology & puries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on the Cardio- Respiratory System Physiological changes due	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular system. Learning the effects of exercises on the Deapiretery	• • • • •	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	At th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems.
Unit 7	Př In 1. 2. 3.	Physiology & pries in Sport Physiological factors determining components of physical fitness Effect of exercise on the Muscular System Effect of exercise on the Cardio- Respiratory System Physiological changes due to aging	•	Understanding the physiological factors determining the components of physical fitness. Learning the effects of exercises on the Muscular system. Learning the effects of exercises on Cardiovascular system. Learning the effects of exercises on the Respiratory	•	Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning	Ai th st al *	fter completing ne unit, the tudents will be ble to: Recognize the physiological factors determining the components of physical fitness. Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems. Figure out the physiological changes due to

5. Sports injuries: Classification (Soft Tissue Injuries - Abrasion, Contusion, Laceration, Incision, Sprain & Strain Bone & Joint Injuries - Dislocation, Fractures - Green Stick, Comminuted Transverse Oblique & Impacted)	 Learning the changes caused due to aging. Understanding the Sports Injuries (Classification, Causes, and Prevention) Understanding the Aims & Objectives of First Aid Understanding the Management of Injuries 		Classify sports injuries with its Management.
Unit 8Biomecha nics and Sports1.Newton's Law of Motion & it application in sports2.Types of Levers and their application in Sports.3.Equilibrium – Dynamic & Static and Centre of Gravity and it application in sports4.Friction & Sports5.Projectile in Sports	 Understanding Newton's Laws of Motion and their Application in Sports. Make students understand the lever and its application in sports. Make students understand the concept of Equilibrium and its application in sports. Understanding Friction in Sports. Understanding the concept of Projectile in sports. 	 Lecture-based instruction, Technology- based learning, Group learning, Individual learning, Inquiry-based learning, Kinesthetic learning, Game-based learning and Expeditionary learning 	After completing the unit, the students will be able to: * Understand Newton's Law of Motion and its application in sports * Recognize the concept of Equilibrium and its application in sports. * Know about the Centre of Gravity and will be able to apply it in sports * Define Friction and application in sports. * Understand the concept of Projectile in sports.

Unit	Psychology	•	To make students	•	Lecture-based	Af	ter completing
9	and Sports		understand		instruction,	the unit, the	
			Personality & its	•	Technolo	st	udents will be
	1. Personality;		classifications.		gy-based	ab	le to:
	its definition &				Crown loorning		
	types (Jung	•	To make students	•	Group learning,	*	Classify different
	Classification		understand	•	learning		types of
	& Big Five		motivation and its		Inquiry-based		their relationship
	Theory)		techniques.	•	learning.		with sports
	-			•	Kinesthetic		performance
	2. Motivation,	•	To make students		learning,		portormanoo.
	its type &		about Exercise	•	Game-based	*	Recognise the
	techniques.		Adherence and		learning and		concept of
	_		Strategies for	•	Expeditionary		motivation and
	3. Exercise		enhancing		learning		identify various
	Adherence:		Adherence to				types of
	Reasons,		Exercise.				motivation.
	Benefits &						
	for	•	To make them			*	Identify various
	Enhancing it		aware of				reasons to
			Aggression in				exercise, its
	1 Mooning		sports and types.				associated
	4. Wearing,		-				benefits and
	Types of	•	I o make students				strategies to
	Aggression		Understand				evercise
	s in Sports		Attributos in Sports				adherence
			Aundules in Spons.				
	5. Psychological					*	Differentiate
	Attributes in						between
	Sports – Self-						different types
	Esteem,						of aggression in
	Mental						sports.
	Imagery, Self-						
	Talk, Goal					*	Explain various
	Setting						psychological
							attributes in
Unit	Training in					٨	sports.
10	Sports	•	Making the students	•	Lecture-based	Aī th	ter completing
	1 Concept of		understand the		Technology-	st	udents will be
	Talent		identification and	•	based learning.	ab	ole to:
	Identification		methods in sports		Group learning,	•	understand the
	and Talent	_	Making the	•	Individual		concept of talent
	Development	•	waking me		learning,		identification and
	in Sports		Inderstand shorts	•	Inquiry-based		methods used
			Understand spons		learning,		

2.	Introduction to Sports Training Cycle – Micro, Meso, Macro Cycle.	•	training and the different cycle in sports training. Making the students Understand different types &	•	kinesthetic learning, Game-based learning and Expeditionary learning	•	for talent development in sports. Understand sports training and the different cycle
3.	Types & Methods to Develop – Strength, Endurance, and Speed.	•	methods of strengths, endurance, and speed. Making the students			•	training process. Understand different types & methods to
4.	Types & Methods to Develop – Flexibility and Coordinative Ability.	•	Understand different types & methods of flexibility and coordinative ability.				develop - strength, endurance, and speed in sports training
5.	Circuit Training - Introduction & its importance	•	Making the students understand Circuit training and its importance			•	Understand different types & methods to develop – flexibility and coordinative ability.
						•	Understand Circuit training and its importance

GUIDELINES FOR INTERNAL ASSESSMENT

(PRACTICAL/ PROJECTS ETC.)

PRACTICAL	(Max. Marks 30)
Physical Fitness Test: SAI Khelo India Test, Brockport Physical Fitness Test (BPFT)*	6 Marks
Proficiency in Games and Sports (Skill of any one IOA recognized Sport/Game of Choice)**	7 Marks
Yogic Practices	7 Marks
Record File ***	5 Marks
Viva Voce (Health/ Games & Sports/ Yoga)	5 Marks

*Test for CWSN (any 4 items out of 27 items. One item from each component: Aerobic Function, Body Composition, Muscular strength & Endurance, Range of Motion or Flexibility)

- **CWSN (Children With Special Needs Divyang): Bocce/Boccia, Sitting Volleyball, Wheel Chair Basketball, Unified Badminton, Unified Basketball, Unified Football, Blind Cricket, Goalball, Floorball, Wheel Chair Races and Throws, or any other Sport/Game of choice.
- **Children with Special Needs can also opt any one Sport/Game from the list as alternative to Yogic Practices. However, the Sport/Game must be different from Test -'Proficiency in Games and Sports'

***Record File shall include:

- > **Practical-1:** Fitness tests administration. (SAI Khelo India Test)
- Practical-2: Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease.
- Practical-3: Anyone one IOA recognized Sport/Game of choice. Labelled diagram of Field & Equipment. Also, mention its Rules, Terminologies & Skills.

PRESCRIBED TEXTBOOKS (CLASS XI & XII)



CBSE Physical Education Class XI Text Book https://cbseacademic.nic.in//web_material/Manuals/PhysicalEducation11_2022.pdf



CBSE Physical Education Class XII Text Book https://cbseacademic.nic.in/web_material/Manuals/PhysicalEducation12_2022.pdf

CLASS XII (2025-26) PHYSICS (THEORY)

Time: 3 hrs.

Max Marks: 70

UNIT	CHAPTERS	MARKS		
Unit–I	Electrostatics			
	Chapter–1: Electric Charges and Fields			
	Chapter-2: Electrostatic Potential and Capacitance	16		
Unit-II	Current Electricity			
	Chapter-3: Current Electricity			
Unit-III	Magnetic Effects of Current and Magnetism			
	Chapter–4: Moving Charges and Magnetism			
	Chapter–5: Magnetism and Matter	17		
Unit-IV	Electromagnetic Induction and Alternating Currents			
	Chapter–6: Electromagnetic Induction			
	Chapter–7: Alternating Current			
Unit-V	Electromagnetic Waves			
	Chapter-8: Electromagnetic Waves			
Unit-VI	Optics	18		
	Chapter–9: Ray Optics and Optical Instruments			
	Chapter–10: Wave Optics			
Unit–VII	Dual Nature of Radiation and Matter			
	Chapter–11: Dual Nature of Radiation and Matter			
Unit-VIII	Atoms and Nuclei	12		
	Chapter–12: Atoms			
	Chapter–13: Nuclei			
Unit–IX	Electronic Devices			
	Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits	7		

Unit I: Electrostatics

Chapter-1: Electric Charges and Fields

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).

Chapter-2: Electrostatic Potential and Capacitance

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 polarization, 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 (no derivation, formulae only).

Unit II: Current Electricity

Chapter-3: Current Electricity

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance, Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's rules, Wheatstone bridge.

Unit III: Magnetic Effects of Current and Magnetism

Chapter-4: Moving Charges and Magnetism

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 solenoid (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields.

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; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer- its current sensitivity and conversion to ammeter and voltmeter.

Chapter-5: Magnetism and Matter

Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines.

Magnetic properties of materials- Para-, dia- and ferro – magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties.

Unit IV: Electromagnetic Induction and Alternating Currents

Chapter–6: Electromagnetic Induction

Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction.

Chapter-7: Alternating Current

Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LCR series circuit (phasors only), resonance, power in AC circuits, power factor, wattless current. AC generator, Transformer.

Unit V: Electromagnetic waves

Chapter-8: Electromagnetic Waves

Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only).

Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

Unit VI: Optics

Chapter-9: Ray Optics and Optical Instruments

Ray Optics: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.

Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Chapter-10: Wave Optics

Wave optics: 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 (No derivation final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatment only).

Unit VII: Dual Nature of Radiation and Matter

Chapter-11: Dual Nature of Radiation and Matter

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light.

Experimental study of photoelectric effect

Matter waves-wave nature of particles, de-Broglie relation.

Unit VIII: Atoms and Nuclei

Chapter-12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth possible orbit, velocity and energy of electron in nth orbit, hydrogen line spectra (qualitative treatment only).

Chapter-13: Nuclei

Composition and size of nucleus, nuclear force

Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.

Unit IX: Electronic Devices

Chapter-14: Semiconductor Electronics: Materials, Devices and Simple Circuits

Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors- p and n type, p-n junction

Semiconductor diode - I-V characteristics in forward and reverse bias, application of junction diode -diode as a rectifier.

PRACTICALS

The record to be submitted by the students at the time of their annual examination has to include:

- Record of at least 8 Experiments [with 4 from each section], to be performed by the students.
- Record of at least 6 Activities [with 3 each from section A and section B], to be performed by the students.
- The Report of the project carried out by the students.

Evaluation Scheme

Time 3 hours

Two experiments one from each section	7+7 Marks
Practical record [experiments and activities]	5 Marks
One activity from any section	3 Marks
Investigatory Project	3 Marks
Viva on experiments, activities and project	5 Marks
Total	30 marks

Experiments

Max. Marks: 30

SECTION-A

- 1. To determine resistivity of two / three wires by plotting a graph for potential difference versus current.
- 2. To find resistance of a given wire / standard resistor using metre bridge.
- 3. To verify the laws of combination (series) of resistances using a metre bridge.

OR

To verify the laws of combination (parallel) of resistances using a metre bridge.

- 4. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.
- 5. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.

OR

To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.

6. To find the frequency of AC mains with a sonometer.

Activities

- 1. To measure the resistance and impedance of an inductor with or without iron core.
- 2. To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.
- 3. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
- 4. To assemble the components of a given electrical circuit.
- 5. To study the variation in potential drop with length of a wire for a steady current.
- 6. To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.

SECTION-B

Experiments

- 1. To find the value of *v* for different values of *u* in case of a concave mirror and to find the focal length.
- 2. To find the focal length of a convex mirror, using a convex lens.
- 3. To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and 1/v.
- 4. To find the focal length of a concave lens, using a convex lens.
- 5. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
- 6. To determine refractive index of a glass slab using a travelling microscope.
- 7. To find the refractive index of a liquid using convex lens and plane mirror.
- 8. To find the refractive index of a liquid using a concave mirror and a plane mirror.
- 9. To draw the I-V characteristic curve for a p-n junction diode in forward and reverse bias.

Activities

- 1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
- 2. Use of multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether a given electronic component (e.g., diode) is in working order.

- 3. To study effect of intensity of light (by varying distance of the source) on an LDR.
- 4. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
- 5. To observe diffraction of light due to a thin slit.
- 6. To study the nature and size of the image formed by a (i) convex lens, or (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).
- 7. To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.

Suggested Investigatory Projects

- 1. To study various factors on which the internal resistance/EMF of a cell depends.
- 2. To study the variations in current flowing in a circuit containing an LDR because of a variation in
 - (a) the power of the incandescent lamp, used to 'illuminate' the LDR (keeping all the lamps at a fixed distance).
 - (b) the distance of an incandescent lamp (of fixed power) used to 'illuminate' the LDR.
- 3. To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, an equiconvex lens (made from a glass of known refractive index) and an adjustable object needle.
- 4. To investigate the relation between the ratio of (i) output and input voltage and (ii) number of turns in the secondary coil and primary coil of a self-designed transformer.
- 5. To investigate the dependence of the angle of deviation on the angle of incidence using a hollow prism filled one by one, with different transparent fluids.
- 6. To estimate the charge induced on each one of the two identical Styrofoam (or pith) balls suspended in a vertical plane by making use of Coulomb's law.
- 7. To study the factor on which the self-inductance of a coil depends by observing the effect of this coil, when put in series with a resistor/(bulb) in a circuit fed up by an A.C. source of adjustable frequency.
- 8. To study the earth's magnetic field using a compass needle -bar magnet by plotting magnetic field lines and tangent galvanometer.

Practical Examination for Visually Impaired Students of Classes XI and XII Evaluation Scheme

Time 2 hours

Max. Marks: 30

Identification/Familiarity with the apparatus	5 marks
Written test (based on given/prescribed practicals)	10 marks
Practical Record	5 marks
Viva	10 marks
Total	30 marks

General Guidelines

- The practical examination will be of two-hour duration.
- A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 15 practical skill based very short answer type questions. A student would be required to answer any 10 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question papers should be related to the listed practicals.
- Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record at least five of the listed experiments as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills, precautions etc.
- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory/principle/concept, apparatus/ materials/chemicals required, procedure, precautions, sources of error etc.

Class XII

A. Items for Identification/ familiarity with the apparatus for assessment in practicals (All experiments)

Meter scale, general shape of the voltmeter/ammeter, battery/power supply, connecting wires, standard resistances, connecting wires, voltmeter/ammeter, meter bridge, screw gauge, jockey Galvanometer, Resistance Box, standard Resistance, connecting wires, Potentiometer, jockey, Galvanometer, Lechlanche cell, Daniell cell [simple distinction between the two vis-à-vis their outer (glass and copper) containers], rheostat connecting wires, Galvanometer, resistance box, Plug-in and tapping keys, connecting wires battery/power supply, Diode, Resistor (Wire-wound or carbon ones with two wires connected to two ends), capacitors (one or two types), Inductors, Simple electric/electronic bell, battery/power supply, Plug- in and tapping keys, Convex lens, concave lens, convex mirror, concave mirror, Core/hollow wooden cylinder, insulated wire, ferromagnetic rod, Transformer core, insulated wire.

B. List of Practicals

- 1. To determine the resistance per cm of a given wire by plotting a graph between voltage and current.
- 2. To verify the laws of combination (series/parallel combination) of resistances by Ohm's law.
- 3. To find the resistance of a given wire / standard resistor using a meter bridge.
- 4. To determine the resistance of a galvanometer by half deflection method.
- 5. To identify a resistor, capacitor, inductor and diode from a mixed collection of such items.
- 6. To observe the difference between
 - (i) a convex lens and a concave lens
 - (ii) a convex mirror and a concave mirror and to estimate the likely difference between the power of two given convex /concave lenses.
- 7. To design an inductor coil and to know the effect of
 - (i) change in the number of turns
 - (ii) Introduction of ferromagnetic material as its core material on the inductance of the coil.
- 8. To design a (i) step up (ii) step down transformer on a given core and know the relation between its input and output voltages.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

- 1. Physics, Class XI, Part -I and II, Published by NCERT.
- 2. Physics, Class XII, Part -I and II, Published by NCERT.
- 3. Laboratory Manual of Physics for class XII Published by NCERT.
- 4. The list of other related books and manuals brought out by NCERT (consider multimedia also).

Note:

The content indicated in NCERT textbooks as excluded for the year 2025-26 is not to be tested by schools and will not be assessed in the Board examinations 2025-26.

QUESTION PAPER DESIGN

Theory (Class: XI/XII)

Maximum Marks: 70

Duration: 3 hrs.

S No.	Typology of Questions	Total Marks	Approximate Percentage
1	Remembering: Exhibit memory of previously learned	27	38 %
	material by recalling facts, terms, basic concepts, and		
	answers.		
	Understanding : Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas		
2	Applying: Solve problems to new situations by applying	22	32%
	acquired knowledge, facts, techniques and rules in a		
	different way.		
3	Analysing : Examine and break information into parts by	21	30%
	identifying motives or causes. Make inferences and find		
	evidence to support generalizations		
	Evaluating:		
	Present and defend opinions by making judgments about		
	information, validity of ideas, or quality of work based on a		
	set of criteria.		
	Creating:		
	Compile information together in a different way by		
	combining elements in a new pattern or proposing		
	alternative solutions.		
	Total Marks	70	100
	Practical	30	
	Gross Total	100	

Note:

The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and typology of questions same.

For more details kindly refer to Sample Question Paper of class XII for the year 2025-26 to be published by CBSE at its website.