



Bosco Public School
Sunder Vihar, Paschim Vihar, New
Delhi www.boscoschool.com



CLASS XII ARTS
SYLLABUS (2023-24)

S.No.	Subjects	Page No.
1.	English	2-4
2.	Mathematics	5-7
3.	Psychology	8-12
4.	Political Science	13-17
5.	Economics	18-21
6.	Informatics Practices	22-24
7.	Physical Education	25-28
8.	Biology	29-32

ENGLISH

General Objectives:

- To listen and comprehend live as well as record in writing oral presentations on a variety of topics.
- To develop greater confidence and proficiency in the use of language skills necessary for social and academic purpose.
- To participate in group discussions, interviews by making short oral presentation on given topics.
- To perceive the overall meaning and organisation of the text (i.e. the relationships of the different 'chunks' in the text to each other).
- To identify the central/main point and supporting details etc. to build communicative competence in various skills of English.
- To promote advanced language skills with an aim to develop the skills of reasoning, drawing inferences, etc. through meaningful activities.
- To develop ability and knowledge required in order to engage in independent reflection and enquiry.

Marks Division

Section	Marks
Reading Comprehension	22
Creative Writing Skills	18
Textbooks and Supplementary Reading Text	40
	80
ASL and Project File	10 + 10
Total	100

APRIL

Reading: Unseen Passage

Writing: Notice Writing

Literature: Flamingo

- Chapter 1 - The Last Lesson
- My Mother at Sixty-six (Poem) Vistas
- Chapter 1 - The Third Level

MAY

Reading: Unseen Passage

Writing: Letter to the Editor, Article

Literature: Flamingo

- Chapter 3 - Deep Water
- Keeping Quiet (Poem) Vistas
- Chapter 6 - On the Face of It

JULY

Reading: Unseen Passage

Writing: Job Application, Report Writing

Literature: Flamingo

- Chapter 5 – Indigo
- Chapter 4 - The Rattrap
- Roadside Stand (Poem) Vistas
- Chapter 4 Enemy

AUGUST

Reading: Unseen Passage

Writing: Formal & Informal Invites and Replies

Literature: Flamingo

- A Thing of Beauty (Poem)
- Chapter 2 - Lost Spring Vistas
- Chapter 2 - Tiger King
- Chapter 3 - Journey to the End of the Earth

Assessment of Listening and Speaking Skills

SEPTEMBER

Revision and Half Yearly Examination

OCTOBER

Reading: Unseen Passage

Literature: Flamingo

- Aunt Jennifer's Tiger (Poem)
- Chapter 7 - The Interview
- Chapter 6 - Poets and Pancakes
- Chapter 8 - Going Places
Vistas
- Chapter 8 - Memories of Childhood

NOVEMBER

Revision

Assessment of Listening and Speaking Skills

Project Work

DECEMBER

Revision and Pre - Board Examination I

JANUARY

Pre-Board Examination II

Syllabus for Examination

<p>Unit Test 1</p>	<p>Reading: Unseen Passage Writing: Notice Writing Literature:</p> <ul style="list-style-type: none"> • Ch - 1 The Last Lesson • My Mother at Sixty-six (Poem)
<p>Half Yearly Examination</p>	<p>Literature: Flamingo</p> <ul style="list-style-type: none"> • Ch - 1 The Last Lesson Ch - 2 Lost Spring • My Mother at Sixty-six (Poem) • Ch - 3 Deep Water • Roadside Stand (Poem) • Ch - 5 Indigo • Ch - 4 The Rattrap • Keeping Quiet (Poem) • A Thing of Beauty (Poem) • Roadside Stand (Poem) <p>Vistas</p> <ul style="list-style-type: none"> • Ch - 1 The Third Level • Ch - 2 Tiger King • Ch - 3 Journey to the End of the Earth • Ch - 4 The Enemy • Ch - 6 On the Face of It <p>Reading: Unseen Passage Writing: Notice Writing, Letter to the Editor, Article, Job Application, Report, Formal & Informal Invites and Replies</p>
<p>Pre- Board Examination 1</p>	<p>Complete Syllabus</p>
<p>Pre- Board Examination 2</p>	<p>Complete Syllabus</p>

MATHEMATICS

General Objectives:

- To acquire a precise knowledge and critical understanding of the basic concepts
- To develop a positive attitude towards thinking
- To articulate and analyse logically
- To become precise and logical.

S. No	UNITS	MARKS
1	Relation and Function	8
2	Algebra	10
3	Calculus	35
4	Vector and Three-Dimensional Geometry	14
5	Linear Programming	5
6	Probability	8
	Total	80
	Internal Assessment	20

APRIL

- **Chapter 2 : Inverse trigonometric functions**

Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions

- **Chapter-3: Matrices**

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. On- commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries)

MAY

- **Chapter-4: Determinants**

Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

- **Chapter-5: Continuity and differentiability**

Continuity and differentiability, chain rule, derivative of inverse trigonometric functions, like \sin^{-1} , $\cos^{-1}x$ and $\tan^{-1}x$, derivative of implicit functions. Concept of exponential and logarithmic functions.

Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.

JULY

- **Chapter-5: Continuity and Differentiability(continued)**

Continuity and differentiability, chain rule, derivative of inverse trigonometric functions, like \sin^{-1} , $\cos^{-1}x$ and $\tan^{-1}x$, derivative of implicit functions. Concept of exponential and logarithmic functions.

Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.

- **Chapter-6: Application of Derivatives**

Applications of derivatives: rate of change of bodies, increasing/decreasing functions, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool).

- Simple problems (that illustrate basic principles and understanding of the subject as well as real life situations).

- **Chapter-1 : Relation and Function**

Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions.

AUGUST

- **Chapter-12: Linear Programming**

Introduction, related terminology such as constraints, objective function, optimization, graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

- **Chapter-7: Integrals**

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

SEPTEMBER

Revision and Half Yearly Examination

OCTOBER

- **Chapter-7: Integrals (continued)**

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

- **Chapter-8: Application of Integrals**

Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only)

- **Chapter-9: Differential equation**

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type:

NOVEMBER

- **Chapter-10: Vectors**

Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.

- **Chapter-11: Three- Dimensional Geometry**

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines.

- **Chapter-13: Probability**

Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean of random variable.

DECEMBER

Revision and pre-board -1 examination

JANUARY

Pre-board- 2 examination

Syllabus for examination

EXAMINATION	CHAPTERS
Unit Test-1	<ul style="list-style-type: none">• Ch.2. Inverse Trigonometric Functions• Ch.3: Matrices• Ch.4: Determinants
Half-Yearly Exam	<ul style="list-style-type: none">• Ch.1: Relation and functions• Ch.2 Inverse Trigonometric Functions• Ch.3: Matrices• Ch.4: Determinants• Ch.5: Continuity and Differentiability• Ch.6 : Application of Derivatives• Ch.12: Linear Programming
Pre-board 1	<ul style="list-style-type: none">• Complete Syllabus
Pre-board 2	<ul style="list-style-type: none">• Complete Syllabus

PSYCHOLOGY

General Objectives:

- To understand human differences in functioning and psychological attributes, analyse psychometric theories of intelligence and examine special abilities' nature and measurement.
- Understanding the concept of self-concept, describing personality and its major approaches and assessment techniques.
- To understand the nature of stress, various coping strategies and exploring positive health promotion.
- To understand the concept of Abnormality, its causes, and the nature of various psychological disorders.
- Understanding the process of psychotherapy and its types, and rehabilitation of mentally ill.
- To understand attitude formation and the concept of prejudice and discrimination and ways to handle prejudice.
- Understanding the group formation, the types of groups and how group influences the behaviour.

UNITS	CLASS XII	MARKS
1.	Variations in Psychological Attributes	13
2.	Self and Personality	13
3.	Meeting Life Challenges	9
4.	Psychological Disorders	12
5.	Therapeutic Approaches	9
6.	Attitude and Social Cognition	8
7.	Social Influence and Group Processes	6
	Total (Theory)	70
	Practical & Project work	30
	Total (Theory+ Practical)	100

APRIL

Unit 1: Variations in Psychological Attributes

- Introduction
- Individual Differences in Human Functioning
- Assessment of Psychological Attributes
- Intelligence
- Psychometric Theories of Intelligence, Information Processing Theory: Planning, Attention-arousal and Simultaneous successive Model of Intelligence, Triarchic Theory of Intelligence; Theory of Multiple Intelligences.
- Individual Differences in Intelligence

- Culture and Intelligence
- Emotional Intelligence
- Special Abilities: Aptitude: Nature and Measurement
- Creativity

MAY

Unit 2: Self and Personality

- Introduction
- Self and Personality
- Concept of Self
- Cognitive and Behavioral aspects of Self
- Culture and Self
- Concept of Personality
- Major Approaches to the Study of Personality
 1. Type Approaches
 2. Trait Approaches
 3. Psychodynamic Approach and Post Freudian Approaches
 4. Behavioral Approach
 5. Cultural Approach
 6. Humanistic Approach
- Assessment of Personality
 1. Self-report Measures
 2. Projective Techniques
 3. Behavioral Analysis

JULY

Unit 3: Meeting Life Challenges

- Introduction
- Nature, Types and Sources of Stress
- Effects of Stress on Psychological Functioning and Health
 1. Stress and Health
 2. General Adaptation Syndrome
 3. Stress and Immune System
 4. Lifestyle
- Coping with Stress
 1. Stress Management Techniques
- Promoting Positive Health and Well-being
 1. Life Skills
 2. Positive Health

AUGUST

Unit 4: Psychological Disorders

- Introduction
- Concepts of Abnormality and Psychological Disorders
 1. Historical Background
- Classification of Psychological Disorders
- Factors Underlying Abnormal Behavior
- Major Psychological Disorders
 1. Anxiety Disorders
 2. Obsessive-Compulsive and Related Disorders
 3. Trauma-and Stressor-Related Disorders
 4. Somatic Symptom and Related Disorders
 5. Dissociative Disorders
 6. Depressive Disorder
 7. Bipolar and Related Disorders
 8. Schizophrenia Spectrum and Other Psychotic Disorders
 9. Neurodevelopmental Disorders
 10. Disruptive, Impulse-Control and Conduct Disorders
 11. Feeding and Eating Disorders
 12. Substance Related and Addictive Disorders

SEPTEMBER

Revision and Half-Yearly Examination

OCTOBER

Unit 5: Therapeutic Approaches

- Nature and Process of psychotherapy
 1. Therapeutic relationship
- Types of Therapies
 1. Behavior Therapy
 2. Cognitive Therapy
 3. Humanistic-Existential Therapy
 4. Alternative Therapies
 5. Factors contributing to healing in Psychotherapy
 6. Ethics in Psychotherapy
- Rehabilitation of the Mentally Ill

Unit 6: Attitude and Social Cognition

- Introduction
- Explaining Social Behavior
- Nature and Components of Attitudes
- Attitude Formation and Change
 1. Attitude Formation
 2. Attitude Change
 3. Attitude-Behavior Relationship
- Prejudice and Discrimination
- Strategies for Handling Prejudice

NOVEMBER

Unit 7: Social Influence and Group Processes

- Introduction
- Nature and Formation of Groups
- Type of Groups
- Influence of Group on Individual Behavior
 1. Social Loafing
 2. Group Polarization

DECEMBER

Revision and Pre-Board Examination I

JANUARY

Pre-Board Examination II

Practical Examination Marks Distribution-

- Development of case profile: Using appropriate methods like interview, observation & psychological tests.
- Test administration: Students are required to administer and interpret five psychological tests related to various psychological attributes like intelligence, aptitude, attitude, personality, etc.
- In the Practical examination, the student will be required to administer and interpret two psychological tests.

Practical Examination File and Case Profile	10 Marks
Viva Voce (Case Profile & two practicals)	05 Marks
Two Practical (5 marks for conduct of practicals and 10 marks for reporting)	15 Marks
Total	30 Marks

Syllabus for Examination

Unit Test - 1	Unit 1: Variations in Psychological Attributes Unit 2: Self and Personality (Half Unit)
Half-Yearly Examination	Unit 1: Variations in Psychological Attributes Unit 2: Self and Personality Unit 3: Meeting Life Challenges Unit 4: Psychological Disorders
Pre-Board Examination- I	Complete Syllabus
Pre-Board Examination- II	Complete syllabus

POLITICAL SCIENCE

General Objectives:

- Understand the historical account of India and the challenges to Nation Building.
- Be familiar with the diverse perspectives that guided the formation of the United Nations.
- Identify the need of the New Centres of Power and understand its significance.
- Analyze the positive and negative aspect of Globalization in relation to the Contemporary World.
- Understand the India's politics linked to the Party System.
- Develop an understanding of Sustainable Development.
- Explain India's Policies in relation to other countries.
- Understand the aspirations of different regions.

Units	Part A	Marks
	Part A: Contemporary World Politics	
1	The End of Bipolarity	06
2	Contemporary Centres of Power	06
3	Contemporary South Asia	06
4	International Organizations	06
5	Security in Contemporary World	06
6	Environment and Natural Resources	06
7	Globalization	04
	Total	40
Units	Part B	
	Part B: Politics in India since Independence	
1	Challenges of Nation-Building	06
2	Era of One-Party Dominance	04
3	Politics of Planned Development	02
4	India's External Relations	06
4	Challenges to and Restoration of the Congress System	04
5	The Crisis of Democratic Order	04
6	Regional Aspirations	06
7	Indian Politics: Recent Trends and Development	08
	Total	40
Part C	Project Work	20
	Total (A+B+C)	100

APRIL

Part B

Unit 1 Challenges to Nation-Building

- Nation and Nation Building
- Sardar Vallabh Bhai Patel and Integration of States
- Nehru's approach to Nation-Building
- Legacy of partition: Challenge of 'refugee' Resettlement
- The Kashmir problem
- Political conflicts over language
- Linguistic Organisation of States.

Unit 2: Era of One-Party Dominance

- Challenges of building Democracy
- Congress Dominance
- Emergence of Opposition

MAY

Unit 3 Politics of Planned Development

- Political Contestation
- Idea of Development
- Planning
- Planning Commission
- The Early Initiative
- The First Five Year Plan
- Rapid Industrialization

Unit 4 India's External Policy

- Principles of Foreign Policy
- Policy of Non-Alignment
- Afro-Asian Unity
- Nehru's Role
- Chinese Invasion 1962
- War and Peace with Pakistan
- India's Nuclear Policy
- Bangladesh War 1971

JULY

Unit 5: Challenges to and Restoration of the Congress System

- Challenge of Political Succession
- From Nehru to Shastri
- From Shastri to Indira
- Fourth General Election 1967
- Context of the Election
- New Congressism
- Electoral Verdict
- Coalitions
- Deflections

- Split in the Congress
- India VS the Syndicate
- Presidential Election 1969
- The 1971 Election and Restoration of Congress
- The outcome and after Restoration

Unit 6: The Crisis of Democratic Order

- Background Emergency
- Economic Context
- Gujarat and Bihar Movements
- Conflict with Judiciary
- Declaration of Emergency
- Lessons of the Emergency

AUGUST

Unit 7: Regional Aspiration

- Region and the Nation
- Jammu and Kashmir roots of problem
- Politics since 1948
- Punjab demands for Autonomy
- Secessionist Movements

Unit 8: Recent Developments in Indian Politics

- Context of 1990s
- Era of Coalition Alliance Politics
- Mandal Commission
- Communalism, Secularism and Democracy
- Consensus: Lok Sabha Elections 2004

SEPTEMBER

Revision and Half-yearly Examination

OCTOBER

Unit 1: End of Bipolarity

- The Soviet Union
- Gorbachev and the disintegration
- Causes and Consequences of disintegration of Soviet Union
- Shock Therapy and its Consequences
- New entities in World Politics
- Russia
- Balkan States
- Central Asian States
- India's relations with Russia

Unit 2: Contemporary Centres of Power

- European Union
- Association of Southeast Asian Nation
- Rise of China as an Economic Power
- Japan and South Korea as emerging powers

NOVEMBER

Unit 3: Contemporary South Asia

- Military and Democracy in Pakistan and Bangladesh
- Monarchy and Democracy in Nepal
- Ethnic Conflict and Democracy in Sri Lanka
- India and its Neighbours
- Peace and Cooperation

Unit 4: International Organizations

- Meaning and importance of International Organisation
- Evolution of UN
- Structure and Functions of UN
- Principal Organs of UN
- Reforms of the UN after Cold war
- Reforms of Structures, Processes and Jurisdiction of the UN
- India and the UN Reforms
- Key Agencies: IMF, World Bank, WTO, ILO, IAEA
- NGO
- Implications and Future of International Organization

DECEMBER

Unit 5 Security in the Contemporary World

- Meaning and Type of Security.
- Traditional concept of security
- Non-tradition notions of Security.
- New Sources of Threats
- Cooperative Security
- India's Security strategy

Unit 6 Environment and Natural Resources

- Environmental Movements
- Global Warming and Climate Change
- Conservation of Natural Resources.

Unit 7 Globalization

- Globalization: Meaning
- Manifestation and Debates
- Causes and Consequences
- India and Globalization

JANUARY

Pre-board Examination 2

FEBURARY-MARCH

Revision and Final Examination

Syllabus for Examination

Unit Test – I	Part B Unit 1: Challenges to Nation Building Unit 2: Planned Development
Half-Yearly Examination	Part A Unit 1: The End of Bipolarity Unit 2: New Centres of Power Unit 3: Contemporary South Asia Part B Unit 1: Challenges of Nation-Building Unit 2: Planned Development Unit 3: India’s Foreign Policy Unit 4: Parties and Party System in India Unit 5: Democratic Resurgence
Pre-Board Examination 1	Complete syllabus
Pre-Board Examination 2	Complete syllabus

ECONOMICS

General Objectives:

- Understanding of some basic economic concepts and development of economic reasoning which the learners can apply in their day-to-day life as citizens, workers and consumers.
- Realisation of learners' role in nation building and sensitivity to the economic issues that the nation is facing today.
- Equipment with basic tools of economics and statistics to analyse economic issues. This is pertinent for even those who may not pursue this course beyond senior secondary stage.
- Development of understanding that there can be more than one view on any economic issue and necessary skills to argue logically with reasoning.

UNITS	PART – A	MARKS
	Introductory Macroeconomics	
1	National Income and Related Aggregates	10
2	Money and Banking	6
3	Determination of Income and Employment	12
4	Government Budget and the Economy	6
5	Balance of Payments	6
	TOTAL	40
UNITS	PART – B	MARKS
	Indian Economic Development	
6	Development Experience (1947-90) and Economic Reforms since 1991	12
7	Current Challenges facing Indian Economy	20
8	Development Experience of India -A Comparison with Neighbors	8
	TOTAL	40
	PART C	MARKS
	Project Work	20
	TOTAL(A+B+C)	100

APRIL

Unit 6: Development Experience (1947-90) and Economic Reforms since 1991

A brief introduction of the state of Indian economy on the eve of independence.

Indian economic system and common goals of Five Year Plans.

Main features, problems and policies of agriculture (institutional aspects and new agricultural strategy), industry (IPR 1956; SSI – role & importance) and foreign trade.

MAY

Part A: Introductory Macroeconomics

Unit 2: Money and Banking

Money – meaning and functions, supply of money - Currency held by the public and net demand deposits held by commercial banks. Money creation by the commercial banking system. Central bank and its functions (example of the Reserve Bank of India): Bank of issue, Govt. Bank, Banker's Bank, Control of Credit through bank rate, CRR, SLR, Repo Rate Reverse Repo Rate, open market operations and margin requirements

Unit 4: Government Budget and the Economy

Government budget - meaning, objectives and components.

Classification of receipts - revenue receipts and capital receipts; classification of expenditure – revenue expenditure and capital expenditure. Balanced, Surplus and Deficit Budget

Measures of government deficit - revenue deficit, fiscal deficit, primary deficit their meaning.

Project Work

JULY

Unit 5: Balance of Payments

Balance of payments account - meaning and components.

Balance of Payments – Surplus and Deficit

Foreign exchange rate - meaning of fixed and flexible rates and managed floating.

Determination of exchange rate in a free market, merits and demerits of Flexible and Fixed exchange rate system. Managed floating exchange rate system.

Unit 6: Development Experience (1947-90) and Economic Reforms since 1991

Economic Reforms since 1991:

Features and appraisals of liberalization, globalization and privatization (LPG policy);

Concepts of demonetization and GST

Unit 7: Current challenges facing Indian Economy

Human Capital Formation: How people become resource; Role of human capital in economic development.

Rural development: Key issues - credit and marketing - role of cooperatives; agricultural diversification.

Project Work

AUGUST

Part A: Introductory Macroeconomics

Unit 1: National Income and Related Aggregates

What is Macroeconomics?

Basic concepts in macroeconomics: consumption goods, capital goods, final goods, intermediate goods; stocks and flows; gross investment and depreciation.

Circular flow of income (two sector model); Methods of calculating National Income - Value Added or Product method, Expenditure method, Income method.

Aggregates related to National Income:
Gross National Product (GNP), Net National Product (NNP), Gross Domestic Product (GDP) and Net Domestic Product (NDP) - at market price, at factor cost.
Real and Nominal GDP. GDP and Welfare

OCTOBER

Unit 3: Determination of Income and Employment

Aggregate demand and its components. Propensity to consume and propensity to save. (average and marginal). Short-run equilibrium output; investment multiplier and its mechanism. Meaning of full employment and involuntary unemployment. Problems of excess demand and deficient demand; measures to correct them.
- changes in government spending, taxes and money supply.

NOVEMBER

Part B: Indian Economic Development

Unit 7: Current challenges facing Indian Economy

Employment: Growth and changes in work force participation rate in formal and informal sectors; problems and policies
Sustainable Economic Development: Meaning, Effects of Economic Development on Resources and Environment, including global warming.

Unit 8: Development Experience of India:

A comparison with neighboring Pakistan, China and India.
Issues: Economic growth, population, sectoral development and other
Human Development Indicators

Project Work

DECEMBER

Revision and Doubts

Guidelines for Project Work: 20 Marks

Only ONE Project is to be done throughout the session.

1. The objectives of the project work:

Objectives of project work are to enable learners to:

- Probe deeper into personal enquiry, initiate action and reflect on knowledge and skills, views etc. acquired during the course of class XI-XII.
- Analyze and evaluate real world scenarios using theoretical constructs and arguments
- Demonstrate the application of critical and creative thinking skills and ability to produce an independent and extended piece of work
- Follow up aspects in which learners have interest
- Develop the communication skills to argue logically

Syllabus for Examination

Examination	Topic
Unit Test – 1	Part A – Unit-2 Money and Banking
Half-Yearly Exam	Part A – Unit-1,2,4,5 Part B – Unit 7 (Human Capital Formation and Rural Development)
Pre-Board I Exam	Complete syllabus
Pre-Board II Exam	Complete syllabus

INFORMATICS PRACTICES

General Objectives:

- Create Series, Data frames and apply various operations.
- Perform aggregation operations, calculate descriptive statistics.
- Visualize data using relevant graphs.
- Design SQL queries using aggregate functions.
- Import/Export data between SQL database and Pandas.
- Learn terminology related to networking and internet.
- Identify internet security issues and configure browser settings.
- Explain the impact of technology on society including gender and disability issues.

Marks Distribution

UNIT NO.	UNIT NAME	MARKS
1	Data Handling using Pandas and Data Visualization	25
2	Database Query using SQL	25
3	Introduction to Computer Networks	10
4	Societal Impacts	10
	Total	70

APRIL

• Data Handling using Pandas - 1:

Introduction to Python libraries- Pandas, Matplotlib. Data structures in Pandas - Series and Data Frames.

- **Series:** Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing.

Practical:

Programs based on Pandas (Series)

MAY

• Data Handling using Pandas – 1(contd.)

- **Data Frames:** creation of data frames from dictionary of series, list of dictionaries, text/CSV files, display, iteration. Operations on rows and columns: add (insert /append), select, delete (drop column and row), rename, Head and Tail functions, indexing using labels, Boolean indexing.

Practical:

Programs based on Pandas (Series and Dataframes).

JULY

• Plotting data using Matplotlib:

Use of Matplotlib

Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram, pie chart, frequency polygon, box plot and scatter plot.

Customizing plots: colour, style (dashed, dotted), width; adding label, title, and legend in plots.

- **Transferring data between CSV files and Data frames**

Practical:

Programs based on Pandas, matplotlib and Python with CSV Files and Dataframes.

Allocation and working on CBSE Project.

AUGUST

- **Societal Impacts:**

Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.

E-waste: hazards and management.

Awareness about health concerns related to the usage of technology.

- **Database Query using SQL:**

- Revision tour of class XI Syllabus

Practical:

Programs based on Pandas and PyPlot. Working on CBSE project

SEPTEMBER

Revision for Half Yearly Exam

OCTOBER

- **Database Query using SQL(contd.)**

- Functions in MYSQL(Single row functions), Aggregate functions in MYSQL, sorting of data, use of group by clause with having clause , Equi join.

Practical:

Working with Python connectivity

NOVEMBER

- **Introduction to Computer Networks:**

Introduction to networks, Types of network: PAN, LAN, MAN, WAN.

Network Devices: modem, hub, switch, repeater, router, gateway

Network Topologies: Star, Bus, Tree, Mesh.

Introduction to Internet, URL, WWW and its applications- Web, email, Chat, VoIP.

Website: Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website.

Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

Practical:

Various Python Programming and working with MySQL.

DECEMBER

Revision and Pre-board - I Examination

JANUARY

Pre-Board Examination- II

Syllabus for Examination

Unit Test I	Ch 2: Data Handling using Pandas -1
Half Yearly Examination	Ch 2: Data Handling using Pandas -1 Importing/Exporting Data between CSV and Pandas (Dataframes) Ch 4: Plotting data using Matplotlib Ch 6: Societal Impacts Revision tour of SQL(Class XI)
Preboard 1 and II Examination	Ch 1: Database Query using SQL Ch 2: Data Handling using Pandas -1 Importing/Exporting Data between CSV and Pandas (Dataframes) Ch 4: Plotting data using Matplotlib Ch 6: Societal Impacts Ch 7: Introduction to Computer Networks
Practical Examination Half Yearly	Pandas (Series and Dataframes) SQL(Class XI) Viva, File & Project
Preboard	Complete Practical Part Viva, File & Project

PHYSICAL EDUCATION

General Objectives:

- Awareness regarding the importance of physical fitness in individual and social life including life skills.
- Bring the overall awareness of values with regards to personal health and fitness and to inculcate among students the desired habit and attitude toward health to raise their health status.
- To make the pupil physically, mentally and emotionally fit and to develop such person and social qualities that will help them to be good human being.
- Individually and collectively to protect and promote (own health)(health of family member)and (health of the surrounding communities and seeking help when required from available community resources..
- To develop interest in exercise sports and games for self satisfaction and make it a part of a life
- Will an individual to enhance in a qualities self must re discipline courage confidence and efficiency
- To Enable and individual to display a sense of responsibility, patriotism, self sacrifice and services to the community.

Marks Distribution (Practical)

S.No.	Practical	Marks
1.	Physical Fitness Test: SAI Khelo India Test, Brockport Physical Fitness Test (BPFT)	6
2.	Proficiency in Games and Sports - (Skill of any one IOA recognised Sport/Game of Choice)	7
3.	Yogic Practices	7
4.	Record File	5
5.	Viva Voce (Health/ Games & Sports/ Yoga	5

APRIL

Unit I Management of Sporting Events

- Functions of Sports Events Management (Planning, Organising, Staffing, Directing & Controlling)
- Various Committees & their Responsibilities (pre; during & post)
- Fixtures and its Procedures – Knock-Out (Bye & Seeding) & League (Staircase, Cyclic and Tabular method) and combination tournaments.
- Intramurals and Extramural tournaments - Meaning, objectives and its Significance
- Community sports program (Sports Day, Health Run, Run for Fun, Run for Specific Cause & Run for Unity)

MAY

Unit II Children & Women in Sports

- Exercise guidelines of WHO for different age groups.
- Common postural deformities-knock knees, flat foot, round shoulders, Lordosis, Kyphosis, Scoliosis, and bow legs and their respective corrective measures.
- Women's participation in Sports – Physical, Psychological, and social benefits.
- Special consideration (menarche and menstrual dysfunction)
- Female athlete triad (osteoporosis, amenorrhea, eating disorders).

Unit III Yoga as Preventive measure for Lifestyle Disease

- **Obesity:** Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Pavanmuktasana, Matsayasana, Halasana, Pachimottansana, Ardha – Matsyendrasana, Dhanurasana, Ushtrasana, Suryabedhan pranayama.
- **Diabetes:** Procedure, Benefits & Contraindications for Katichakrasana, Pavanmuktasana, Bhujang asana, Shalabhasana, Dhanurasana, Supta-vajarasana, Paschimottanasana, Ardha -Mastendrasana, Mandukasana, Gomukasana, Yogmudra, Ushtrasana, Kapalabhati.
- **Asthma:** Procedure, Benefits & Contraindications for Tadasana, Urdhwahastottansana, UttanMandukasana, Bhujangasana, Dhanurasana, Ushtrasana, Vakrasana, Kapalabhati, Gomukhasana Matsyaasana, Anuloma Viloma.
- **Hypertension:** Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Uttanpadasana, Ardha Halasana, Sarala Matyasana, Gomukhasana, UttanMandukasana, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-shodhanapranayam, Sitlipranayam.
- **Back Pain and Arthritis:** Procedure, Benefits & Contraindications of Tadasana, Urdhwahastootansana, Ardh-Chakrasana, Ushtrasana, Vakrasana, Sarala Maysyendrasana, Bhujandgasana, Gomukhasana, Bhadrasana, Makarasana, Nadi- Shodhana pranayama.

JULY

Unit IV Physical Education & Sports for CWSN (Children with Special Needs - *Divyang*)

- Organizations promoting Disability Sports (Special Olympics; Paralympics; Deaflympics)
- Concept of Classification and Divisioning in Sports.
- Concept of Inclusion in sports, its need, and Implementation;
- Advantages of Physical Activities for children with special needs.
- Strategies to make Physical Activities assessable for children with special needs.

Unit V Sports & Nutrition

- Concept of balance diet and nutrition
- Macro and Micro Nutrients: Food sources & functions
- Nutritive & Non-Nutritive Components 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

AUGUST

Unit VI Test & Measurement in Sports

- Fitness Test – SAI Khelo India Fitness Test in school:
 - Age group 5-8 yrs/ class 1-3:** BMI, Flamingo Balance Test, Plate Tapping Test
 - Age group 9-18yrs/class 4-12:** BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach flexibility test, Strength Test (Abdominal Partial Curl Up, Push-Ups for boys, Modified Push-Ups for girls).
- Measurement of Cardio- Vascular Fitness –Harvard Step Test –Duration of the Exercise in Seconds x100/5.5 X Pulse count of 1-1.5 Min after Exercise.
- Computing Basal Metabolic Rate (BMR)
- Rikli & Jones - Senior Citizen Fitness Test
 - I. Chair Stand Test for lower body strength
 - II. Arm Curl Test for upper body strength
 - III. Chair Sit & Reach Test for lower body flexibility
 - V. Eight Foot Up & Go Test for agility
 - VI. Six Minute Walk Test for Aerobic Endurance
- Johnsen – Methney Test of Motor Educability (Front Roll, Roll, Jumping Half-Turn, Jumping full-turn)

SEPTEMBER

Revision for Half Yearly Exam

OCTOBER

Unit VII Physiology & Injuries in Sports

- Physiological factors determining components of physical fitness
- Effect of exercise on Muscular System
- Effect of exercise on Cardio-Respiratory System
- Physiological changes due to aging
- Sports injuries: Classification (Soft Tissue Injuries -Abrasion, Contusion, Laceration, Incision, Sprain & Strain; Bone & Joint Injuries - Dislocation, Fractures - Green Stick, Comminuted, Transverse Oblique & Impacted)

Unit VIII Biomechanics & Sports

- Newton's Law of Motion & its application in sports
- Types of Levers and their application in Sports.
- Equilibrium – Dynamic & Static and Centre of Gravity and its application in sports
- Friction & Sports

- Projectile in Sports

Unit IX Psychology and Sports

- Personality; its definition & types (Jung Classification & Big Five Theory)
- Motivation, its type & techniques.
- Exercise Adherence: Reasons, Benefits & Strategies for Enhancing it
- Meaning, Concept & Types of Aggressions in Sports
- Psychological Attributes in Sports – Self-Esteem, Mental Imagery, Self- Talk, Goal Setting

NOVEMBER

Unit X Training in Sports

- Concept of Talent Identification and Talent Development in Sports
- Introduction to Sports Training Cycle – Micro, Meso, Macro Cycle.
- Types & Method to Develop – Strength, Endurance and Speed
- Types & Method to Develop – Flexibility and Coordinative Ability
- Circuit Training - Introduction & its importance

DECEMBER

Revision and Pre-board I Examination

JANUARY

Pre-board II Examination

Syllabus for Examination

Unit Test- I	Unit I Management of Sporting Events Unit II Children & Women in Sports
Half- Yearly Exam	Unit I Management of Sporting Events Unit II Children & Women in Sports Unit III Yoga as Preventive measure for Lifestyle Disease Unit IV Physical Education & Sports for CWSN Unit V Sports & Nutrition
Pre-Board Examination I	Complete Syllabus
Pre-Board Examination II	Complete Syllabus

BIOLOGY

General Objectives

- To promote understanding of basic principles of Biology.
- To encourage learning of emerging knowledge and its relevance to individual and society.
- To promote rational/specific attitude to issues related to population, environment and development.
- To enhance awareness about environmental issues and problems and the appropriate solutions.
- To create awareness amongst the learners about variations/diversity amongst the living organisms and developing respect for other living beings.
- To appreciate that the most complex biological phenomena are also built on essentially simple processes.

Theory

S.No.	Unit	Title	Marks
1.	VI	Reproduction	16
2.	VII	Genetics and Evolution	20
3.	VIII	Biology and Human Welfare	12
4.	IX	Biotechnology and its Applications	12
5.	X	Ecology and Environment	10
TOTAL			70

Practical

S.No.	Evaluation Scheme	Marks
1.	One Major Experiment	5
2.	One Minor Experiment	4
3.	Slide Preparation	5
4.	Spotting	7
5.	Practical Record + Viva Voce	4
6.	Project Record + Viva Voce	5
	Total	30

APRIL

THEORY

Unit-VI: Reproduction

- **Chapter-1: Sexual reproduction in flowering plants:** Flower structure; Development of male and female gametophytes; Pollination-types, agencies and examples; Outbreeding devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events-Development of endosperm and embryo, Development of seed and formation of fruit; Special modes-apomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.
- **Chapter-2: Human Reproduction:** Male and female reproductive systems; Microscopic anatomy of testis and ovary; Gametogenesis - spermatogenesis & 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 (STD); 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)

PRACTICALS:

- Prepare a temporary mount to observe pollen germination.
- Pollen germination on stigma through a permanent slide or scanning electron micrograph.
- Controlled pollination - emasculation, tagging and bagging.
- Flowers adapted to pollination by different agencies (wind, insect).
- Identification of stages of gamete development i.e. T.S. testis and T.S. ovary through permanent slides (from any mammal).
- T.S. of blastula through permanent slides.

MAY

THEORY

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; linkage and crossing over; Sex determination - in human being, birds, grasshopper and honey bee; Mutation, Pedigree analysis, sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans –sickle cell anaemia, Phenylketonuria, thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.
- **Chapter-5: Molecular Basis of Inheritance:** Structure of DNA and RNA; DNA packaging; Search for genetic material and DNA as genetic material; DNA replication; Central Dogma; transcription, genetic code, translation.

PRACTICALS:

- Mendelian inheritance using seeds of different colour/sizes of any plant.
- Prepared pedigree charts of genetic traits such as rolling of tongue, blood groups, widow's peak, colour blindness.
- Meiosis in onion bud cell or grasshopper testis through permanent slides.

JULY

THEORY

Unit-VII: Genetics and Evolution

- **Chapter-5: Molecular Basis of Inheritance:** Gene expression and regulation - lac operon; Human genome project; 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.

PRACTICALS:

- To isolate DNA from pea seeds / palak.
- Flash cards models showing examples of homologous and analogous organs.

AUGUST

THEORY

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).

PRACTICAL:

- Identification of common disease- causing organisms like Ascaris, Entamoeba, Plasmodium, ringworm through permanent slides or specimens. Comment on symptoms of disease that they cause.

SEPTEMBER

Revision and Half-yearly Examination

OCTOBER

THEORY

Unit-IX: Biotechnology and its Applications

- **Chapter-10: Biotechnology and its Application:** Application of biotechnology in health and agriculture: genetically modified organisms - Bt crops; RNA interference, Human insulin, gene therapy; molecular diagnosis; 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.

PRACTICALS:

- Prepare a temporary mount of onion root tip to study mitosis.
- Study the plant population density by quadrat method.
- Study the plant population frequency by quadrat method.

NOVEMBER

THEORY

Unit-X: Ecology and Environment

- **Chapter-12: Ecosystem** Ecosystems: Patterns, components; productivity and decomposition;

energy flow; pyramids of number, biomass, energy.

- **Chapter-13: Biodiversity and Conservation:** Biodiversity - Concept, levels, 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.

PRACTICAL:

- Models/ specimen showing symbiotic association in root nodules of leguminous plants, *Cuscuta* on host, lichens.

DECEMBER

Revision and Pre-Board Examination I

JANUARY

Pre-Board Examination II

Syllabus for examination

EXAMINATION	CHAPTERS
Unit Test – 1	<ul style="list-style-type: none">● Chapter-1: Sexual reproduction in flowering plants● Chapter-2: Human Reproduction● Chapter-3: Reproductive Health
Half-Yearly Exam	<ul style="list-style-type: none">● Chapter-1: Sexual reproduction in flowering plants● Chapter-2: Human Reproduction● Chapter-3: Reproductive Health● Chapter-4: Principles of Inheritance and Variation● Chapter-5: Molecular Basis of Inheritance● Chapter-6: Evolution● Chapter-7: Human Health and Diseases● Chapter-8: Microbes in Human Welfare
Pre- Board 1	Complete syllabus
Pre- Board 2	Complete syllabus

