Course of Studies

Senior Secondary examination

1.	**Subject (Language)**	**Sub. Code**
1.	Hindi	S501
2.	English	S502
3.	Sanskrit	S503
4.	Urdu	S504
5.	Bengali	S505
6.	Gujrati	S506
7.	Kannada	S507
8.	Assamese	S508
9.	Malayalam	S509
10.	Manipuri	S510
11.	Marathi	S511
12.	Mizo	S512
13.	Odia	S513
14.	Punjabi	S514
15.	Tamil	S515
16.	Telugu	S516
17.	Arabic	S517
18.	Nepali	S518

2. (I) Main Subjects Science :-

21.	Physics.	S521
22.	Chemistry	S522
23.	Mathematics.	S523
24.	Biology	S524

(II) Main. Subjects Commerce:-

25.	Accountancy	S525
26.	Business Study	S526
27.	Economics	S527

(III) Main Subjects Arts :-

28.	Sociology	S528
29.	Political Science	S529
30.	History	S530

3. Optional Subjects :-

1.&RPSXWHU 6FLHQFH	S	. Music Hindustani	S S
.0DVV &RPPXQLFDWLRQ	S	.*HRJUDSK\	S
.(QYLURQPHQWDO 6cience	S	.Physical Education	
.+RPH 6FLHQFH	S	40.Agriculture	S 40
35.Public Administraion	S535	41.Psychology	S537

Study Planning

1. In all subjects examined by the board, a student will be given one paper each carrying 100 marks. However, in subjects requiring practical examination, their will be a theory paper and practical examinations as require in the syllabi and courses.

2. A candidate may offer an additional subject which can be either a language at elective level or an order elective subject as prescribed in the scheme of studies, subject to the conditions laid down in the pass criteria.

3. High School Diploma Certificate-II Equ. to Senior secondary Examination

Science Group

Language	**Medical Subjects**	**Non Medical Subjects**	**Optional Subjects**
Minimum one or Maximum two language, out of which one shell be Hindi or English.	Biology Physics Chemistry	Mathematics* Physics Chemistory	Minimum 1 subject Maximum 2 Subjects
Hindi, English and all of regional languages	* Mathematics subjet can be choose by medical student as a fifth subject		

NOTE: Students can choose minimum Six subjects or maximum Eight subjects.

Commerce Group

Language	Main Subjects	Optional Subjects	Internal Assessment
Minimum one or Maximum two language, out of which one shell be Hindi or English. Hindi, English and all of regional language	Business Studies Accountancy Economics	Minimum 1 subject Maximum 2 Subjects	Compulsory for Physical Education

NOTE: Students can choose minimum Six subjects or maximum Eight subjects.

Humanities/Arts Group

Language	Main Subjects	Optional Subjects	Internal Assessment
Minimum one or Maximum two language, out of which one shell be Hindi or English. Hindi, English and all of regional language	Political Science Sociology History	Minimum 1 subject Maximum 2 Subjects	Compulsory for Physical Education

NOTE: Students can choose minimum Six subjects or maximum Eight subjects.

ACCOUNTANCY

(Cade No. 526)

CLASS XII

BRIEF

The course in Accountancy is introduced at + 2 stage of Senior Secondary education, as formal commerce education is provided after first ten years of schooling. With the fast changing economic scenario and business environment in a state of continuous flux, elementary business education along with accountancy as the language of business and as a source of financial information has carved out a place for itself at the Senior Secondary stage. Its syllabus content should give students a firm foundation in basic accounting principles and methodology and also acquaint them with the changes taking place in the presentation and analysis of accounting information, keeping in view the development of accounting standards and use of computers.

Against this background, the course puts emphasis on developing basic understanding about the nature and purpose of the accounting information and its use in the conduct of business operations. This would help to develop among students logical reasoning, careful analysis and considered judgement.

Accounting as an information system aids in providing financial information. The emphasis at Class XI is placed on basic concepts and process of accounting leading to the preparation of accounts for a sole proprietorship firm. Computerised accounting is becoming more and more popular with increasing awareness about use of computers in business. Keeping this in view, the students are exposed compulsorily to the basic knowledge about computers and its use in accounting in the same year.

In class XII, Accounting for Not for Profit Organisations, Partnership Firms and companies are to be taught as a compulsory part. Students will also be given an opportunity to understand further about Computerized Accounting System, as an optional course to Analysis of Financial Statements.

OBJECTIVES

To familiarise the students with accounting as an information system;

To acquaint the students with basic concepts of accounting and accounting standards;

To develop the skills of using accounting equation in processing business transactions;

To develop an understanding about recording of business transactions and preparation of financial statements;

To enable the students with accounting for reconstitution of partnership firms;

To enable the students to understand and analyse the financial statements; and

To familiarize students with the fundamentals of computerized system of accounting.

One Paper **1 Hour** **Marks : l00**

Unit		**Marks**
Part A : Accounting for not for Profit Organisations, Partnership Firms and Companies		
1.	Accounting for not for profit organizations.	10
2.	Accounting for Partnership Firms	5
3.	Reconstitution of Partnership	20
4.	Accounting for Share Capital and Debenture	25
Part B : Financial Statement Analysis		
5.	Analysis of Financial Statements	12
6.	Cash Flow Statement	8
7.	Project Work	20
	Unit 1 : Project File 4 marks	
	Unit 2 : Written Test 12 marks (one hour)	
	Unit 3 : Viva Voce' 4 marks	
	OR	
Part C : Computerized Accounting		
5.	Overview of Computerized Accounting System	5
6.	Accounting using Database Management System (DBMS)	8
7.	Accounting Applications of Electronic Spread sheet	7
8.	Practical Work in Computerized Accounting	20
	Unit 1 : File 4 marks	
	Unit 2 : Practical Examination 12 marks (one hours)	
	Unit 3 : Viva Voce' 4 marks	

Part A :

Accounting for Not-For-Profit Organisations, Partnership Firms and Companies.

Unit 1 : Accounting for Not-for-profit Organisations

Meaning and features of not for profit organisations.

Meaning and features of fundbased acccounting.

Receipts and payments Account

Preparation of Income and Expenditure Account and Balance Sheet from Receipt and

Payment Account with additional information.

Unit 2 : Accounting for Partnership firms

Nature of Partnership firm, Partnership Deed-meaning, importance.

Partners' Capital Accounts : Fixed vs Fluctuating Capital, Division of Profit among partners,

Profit and Loss Appropriation Account including past adjustments.

Unit 3 : Reconstitution of Partnership

Changes in Profit Sharing Ratio among the existing partners-Sacrificing Ratio and Gaining Ratio.

Accounting for Revaluation of Assets and Liabilities and distribution of reserves

(Accumulated Profits).

Goodwill: Nature, Factors affecting and methods of valuation: Average profit, Super profitand Capitalisation methods.

Admission of a Partner: Effect of Admission of Partner, Change in Profit Sharing Ratio,Accounting Treatment for Goodwill (as per AS 10), Revaluation of Assets and Liabilities,Adjustment of Capitals.

Retirement/Death of a Partner: Change in Profit Sharing ratio, accounting treatment of Good will, Revaluation of Assets and Liabilities, Adjustment of Capitals.Dissolution of a partnership firm.

Unit 4 : Accounting for Share Capital and Debenture

Share Capital : Meaning and Types.

Accounting for share capital: Issue and Allotment of Equity and Preference Shares; public subscription of shares : over subscription and under subscription; issue at par, premium and at discount; calls in advance, calls in arrears, issue of shares for consideration other than cash. Meaning of Private placement of shares and employee stock option plan.

Forfeiture of shares : accounting treatment, re-issue of forfeited shares.

Presentation of Share Capital in company's Balance Sheet.

Issue of debentures at par; Premium and at discount; writing of discount and loss on issueof debentures; Issue of debentures as collatoral security; issue of debentures forconsideration other than cash.

Redemption of debentures; sources : out of profits - debenture redemption reserve / sinking fund; out of capital-methods : lump sum payment, draw by lots, purchase in the open market and conversion (excluding cum-interest and ex-interest).

Part B : Financial Statement Analysis

Unit 5 : Analysis of Financial Statements

Financial Statements of a Company: preparation of simple balance sheet of a company in the prescribed form with major headings only.

Financial Statement Analysis: meaning, significance, limitations,

Tools for Financial Statement Analysis: Comparative Statements, Common Size Statements,

Accounting Ratios: meaning and objectives, types of ratios:

Liquidity Ratios:	Current Ratio, Liquid Ratio
Solvency Ratios:	Debt to Equity, Total Assets to Debt, Proprietary Ratio
Activity Ratios:	Inventory Turnover, Debtors Turnover, Payables Turnover,Working Capital Turnover, Fixed Assets Turnover,
Profitability Ratio:	Gross Profit, Operating, Net Profit, Return on Investment, EarningPer Share, Dividend per Share, Price Earning Ratio

Unit 6 : Cash Flow Statement

Cash Flow Statement: Meaning and objectives, preparation, adjustments related to depreciation, dividend and tax, sale and purchase of non-current assets (as per revised standard issued by ICAI)

Unit 7 : Project Work in Accounting

OR

Part C : Computerised Accounting

Unit 5 : Overview of Computerized Accounting System

Concept and types of Computerised Accounting System (CAS)

Features of a Computerized Accounting System

Structure of a Computerised Accounting System

Unit 6 : Accounting using Database Management System (DBMS)

Concept of DBMS

Objects in DBMS: Tables, Queries, Forms, Reports

Creating data tables for accounting

Using queries, forms and reports for generating accounting information.

Applications of DBMS in generating accounting information such as shareholders' records, sales reports, customers' profile, suppliers' profile, payroll, employees' profile, petty cash register.

Unit 7 : Accounting Applications of Electronic Spreadsheet

Concept of an Electronic Spreadsheet (ES)

Features offered by Electronic Spreadsheet

Applications of Electronic Spreadsheet in generating accounting information, preparing depreciation schedule, loan repayment schedule, payroll accounting and other such applications.

Recommended text books

1. Accountancy - I, Publishing by NCERT
2. Accountancy - II, Publishing by NCERT

ASSAMESE **CLASS-X**

One Paper ***3 Hours*** ***1OO Marks***

Unitwise Distribution of Marks and Periods

Unit No.	Topics	Marks	Period
Unit-I	Prose	30	45
Unit-II	Environment and Disaster Management	15	15
Unit-III	Poetry	25	40
Unit-IV	Drama	20	30
Unit-V	Composition	10	10
	Total	**100**	**140**

Unitwise Distribution of Course Contents

Unit-I : **30 Marks**

Unit-II **15 Marks**

Unit-III **25 Marks**

Unit-IV **20 Marks**

Unit-V **10 Marks**

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ASSAMESE

CLASS-XII

One Paper ***3 Hours*** ***1OO Marks***

Unitwise Distribution of Marks and Periods

Unit No.	Topics	Marks	Period
Unit-I	Selected pieces from Poetry Text	20	25
Unit-II	Selected pieces from Prose Text	15	30
Unit-III	Novel	20	30
Unit-IV	Short Story	10	10
Unit-V	Literary Criticism (Short Story & Novel)	10	10
Unit-VI	Alankar (Rhetorical expression)	10	10
Unit-VII	History of Assamese Literature From 1889 - 1940 ( )	15	25
	Total	**100**	**140**

Unitwise Distribution of Course Contents

Unit-I : **20 Marks**

Unit-II **15 Marks**

Unit-III **20 Marks**

Unit-IV **10 Marks**

Unit-V **10 Marks**

Unit-VI **10 Marks**

Unit-VII

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SYLLABUS
BIOLOGY

RATIONALE

Biology arose in a two fold manner - firstly, as a practising art towards exploring and improving a variety of usable plant and animal products as well as towards maintaining good health; secondly, as an academic pursuit out of human curiosity to know about themselves and other living beings and to understand the position of humankind on the planet Earth. In other words, the storehouse of knowledge about living beings started building up only when humans were curious to know about life. In order to respect and appreciate the great diversity in living things at all levels of organisation, and to understand the impact of biological development on our life style, an attempt has been made in the present syllabus to bring out the different facts of Life. Hence, the themes that highlight the contribution of biology to the analysis and solution of problems of daily life like growth, health, nutrition, and environment, have been chosen as components of the content. The topics based on these themes will be dealt at the individual and community levels. Efforts have been made to reflect biology as not merely a correlational science but also as an experimental discipline by dealing with different tools and techniques used in biological studies. However, the vastness of knowledge has delimited the scope of each topic included in the syllabus. Besides integrating the content and the depth at which it could be dealt, modernity of the concepts as well as emerging areas like Biotechnology, Biochemistry and Immunology have also been introduced. The syllabus includes some optional modules to help the students to enrich in areas of their choice which should facilitate them to choose a career or pursue higher education.

The course would enable the learner to :-

(i) acquire knowledge of biological terms, facts, concepts, principles, and processes in order to understand the living world as a whole.

(ii) appreciate diversity in the living world as also inter-relationships of various living organisms, ecological balance in nature, and the role of biology in human welfare.

(i) visualise the hazards of nuclear weapons and environmental pollution, and to create an awareness for ecological use of natural resources in the service of humankind.

develop insight into the role and impact of Biology in various allied professions such as medicine, agriculture forestry, biotechnology, veterinary sciences and pharmacology.

(v) develop interest in the living world with an aim to respect life.

As a part of this process, the syllabus also aims at developing the following abilities in the students to:

(i) apply knowledge and understanding of biology in situations which are novel and unfamiliar by developing abilities to analyse, hypothesise, draw conclusion and predict results.

(i) develop skills in handling, improvising and manipulating scientific apparatus, and recording observations and data.

(i) develop scientific attitude through the mode of curiosity and evidence for proof.

COURSE CONTENT

The syllabus contains 8 core modules and 4 optional modules which are as follows:-

CORE MODULES		Marks
1.	Diversity and evolution of life	6
2.	Cell, Cell functions and Tissues	10
3.	Functional morphology and Life processes in plants	11
4.	Functional morphology and Life processes in animals	11
5.	Reproduction and Development	10
6.	Heredity and Genetics	10
7.	Population Explosion and Family Planning	4
8.	Environmental Biology	8

OPTIONAL MODULES		Marks
1.	Tools and Techniques in Biology	10
2.	Economic Biology	10
3.	Health Science	10
4.	Emerging Areas in Biology- Biochemistry, Biotechnology and Immunobiology	10

DISTRIBUTION OF MARKS

The core modules are compulsory for all learners. From the list of optional modules the learner can take any 1 course of his/her choice. Thus, each learner takes 9 modules in all.

Core Modules	70
Optional Modules	10
Practical Examination	20
Grand Total	100

MODULE 1: DIVERSITY AND EVOLUTION OF LIFE

Study Time : 25 hours **Marks : 6**

Approach

This module is intended to enable the learner to

BIOLOGY

visualize the origin of life on earth and the vast diversity in the living world from simple to more complex and to attempt to group them together at various levels of classification. In addition, it points out that studies of fossils and changes in population in time and space provide evidence that evolution has occured and is still occurring and provides an explanation for the mechanism of these changes.

Unit 1 Classification of organisms

- Principles of classification and taxonomic categories.
- Linnaeus and binomial nomenclature, general rule for naming, writing and printing of scientific names of organisms.
- Taxonomic categories (taxa) from, species upto phylum.

Unit 2 Viruses

- Characteristics of viruses, taking examples of TMV, Polio, HIV, bacteriophage T2.

Unit 3 Scheme of five kingdom classification of organisms.

Unit 4 Kingdom Prokaryotae (Monera)

- Chemical nature, general structure and characteristics of bacteria with common examples.
- Mention of useful and harmful bacteria like *Lactobacillus, Rhizobium, Mycobacterium tuberculosis, Clostridium tetani, Cornybacterium diphtheria*

Unit 5 Kingdom Protista

- General characteristics and classification upto phyla with examples of *Amoeba, Entamoeba, Plasmodium, Euglena* & Diatoms

Unit 6 Fungi

- General characteristics of fungi, useful and harmful fungi, examples-*Rhizopus*

(Breadmould), Yeast, *Penicillium notatum*, *Puccinia graminis* (wheat rust)

Unit 7 Kingdom Plantae

Algae- *Chlamydomonas, Spirogyra*

Bryophyta (Liverworts and Mosses), Pteridophyta (Ferns), Spermatophyta (Gymnosperms and Angiosperms), General morphological features of flower and fruit and some common examples of the following families: Poaceae (Graminae), Brassicaceae (Cruciferae) and Leguminosae (only Papilionaceae).

Unit 8 Kingdom Animalia

Main characteristics, classification upto phylum and common examples of Porifera, Coelenterata, Platyhelminthes, Nemathelminthes, Annelida, Arthropoda, Mollusca and Echinodermata; Chordata upto classes, classification of Mammalia upto subclasses, with important examples for all.

Unit 9 Origin and Evolution of Life

a) Origin of life : Views, *spontaneous generation, experiments of Pasteur,* Abiogenesis hypothesis, Oparin's hypothesis oforigin of life, Miller's experiment.

b) Organic evolution, progressive and retrogressive evolution, evidences of evolution.

Theories of evolution - Lamarckism, Darwinism, Mutation Theory, Neo Darwinism.

Suggested Teaching/Learning Hints While explaining taxonomic categories of classification examples should be given (in a tabular form, e.g. complete classification of the house of cat and man.) While discussing plant and animal groups, their characteristics, levels of organisation and other features should be given in a tabular form. The fact that evolution is a continuous process should be highlighted.

Suggested extended learning Find out what microbiology deals with. Read articles on the studies made by evolutionists regarding the history of development of mankind in magazines and newspapers. Read and see films on Civilization.

MODULE 2 : CELL, CELL FUNCTION AND TISSUES.

Study Time : 30 hours **Marks : 10**

Approach

This module is designed to get an insight into the entire living world as composed of basically the same kind of unit structure - the cell. All functions in the living body are ultimately the outcome of the activities of cells. The cells are composed of numerous organelles - each concerned with its specific function. Though fundamentally similar, the cells show a vast array of modification and specialization forming tissues to suit the need of different parts of the body and more so in the different kinds of organisms. The learner should be able to understand and appreciate that all organisms starts their life as a tiny single cell which, by repeated division and growth, may finally give rise to giants like elephant or banyan tree.

Unit 1 Cell Structure

Discovery of cell, cell theory, cell-its shape, size, physical and chemical composition, generalized cell structure as seen under compound and electron microscopes, differences between animal and plant cell.

Cell organelles - structure and functions of cell wall, plasma membrane, endoplasmic reticulum, ribosomes, Golgi bodies, micro bodies, Mitochondria, chloroplast, centrosome, cilia and flagella, nucleus (excluding chemical nature of chromosomes) and cell inclusions.

Unit 2 Cell Division

Mitosis and its significance. Meiosis and its significance.

Unit 3 Tissues

Plant Tissues-Meristems-Apical, Intercalary and Lateral: Parenchyma, Collenchyma, Sclerenchyma, Xylem and Phloem.

Animal Tissues-Epithelial, Connective, Muscular and Nervous.

Unit 4 Levels of Organisation (cell to organism)
A general idea about the ascending order of levels of organization-cell, tissues, organ, organ system and organism.

Suggested Teaching/Learning Hints Suitable examples from daily life should be taken in order to explain the levels of organisation, for example the root systems of a tree is one of its organ systems having root, root hairs etc.

Suggested Extended Learning Find out about **'cancer'** cells which differ from normal cells in that they multiply rapidly and wildly and do not follow the normal rules of cellular conduct. Get to know about the tools involved in the investigation of cells.

MODULE 3: FUNCTIONAL MORPHOLOGY AND LIFE PROCESSES IN PLANTS

Study time : 35 hrs **Marks : 11**

Approach

This module intends to highlight the complex nature of the structure and function of the different organ-systems in plants with special emphasis on the life processes occuring in higher plants (e.g. in a flowering plant).

Pre-requisite knowledge Elementary idea about different types of root, stem and leaf and their functions.

Unit 1 :- Root

Primary growth, primary structure of dicot and monocot roots, mode of origin of lateral roots.

Secondary growth in dicot roots.

Special features of root for common functions of anchorage, growth in soil, absorption, conduction of water and mineral salts, as well as special functions of storage and respiration. Distribution of mechanical tissues to withstand pulling strain.

Unit 2 Stem

Primary growth, primary structure of dicot and monocot stem, mode of origin of lateral branches.

Secondary growth in dicot stem.

Growth rings (annual rings), sap wood and heart wood. Structural features for support, exposing leaves and flowers to favourable positions, conduction as well as special functions of storage and photosynthesis.

Distribution of mechanical tissues to withstand bending strain.

Unit 3 Absorption and Transport
Active and passive absorption, diffusion, osmosis, major theories on transport of water and organic substances.

Unit 4 Nutrition
Macronutrients and micronutrients. Deficiency symptoms.

Unit 5 Leaf
Internal structure of dicot and monocot leaf. Distribution of mechanical tissues, stomata, hairs and hydathodes, vascular tissues, air spaces etc.

Unit 6 Transpiration and Guttation
Processes, magnitude and significance of transpiration and guttation, and factors affecting them.

Unit 7 Photosynthesis
The process and its significance. Factors affecting photosynthesis.

Unit 8 Respiration
Aerobic, anaerobic, respiratory quotient, factors affecting respiration (excluding biochemical pathways), fermentation.

Unit 9 Flower and Inflorescence
Parts of a typical flower, flowers in dicots and monocots, arrangement and condition of various parts of flower. Placentation, major types of inflorescence.

Unit 10 Fruit
Definition, major categories, edible parts of common fruits,

Unit 11 Growth and Development
Definitions of growth and development, growth curve,

stages of plant growth, photoperiodism, vernalisation hormonal regulation of growth, measurement of growth. Different types of plant movement and responses; growth, turgor, hydration, tropic and nastic movements.

Suggested Teaching/Learning Hints Specimens of fresh plants should be observed by a learner while studying about its various parts. This should be highlighted in the instuction material. Activities which one can do at home should be given, for example : observing osmosis in a carrot.

Suggested Extended Learning Read about Hybrid Plants which give new varieties of flowers, fruits etc.

MODULE 4 : FUNCTIONAL MORPHOLOGY AND LIFE PROCESSES IN ANIMALS

Study Time : 35 hrs **Marks : 11**

Approach

The module brings out the relationship between the structure and function in animals with special reference to human so that the learner can appreciate the importance of intregration and co-ordination among processes in the functioning organism as a whole.

Pre-requisite knowledge Elementary idea about the human body.

Unit 1 Digestive System

Digestive organs, digestion, absorption, assimilation.

Unit 2 Respiratory System

Respiratory organs, breathing, gaseous transport and tissue respiration.

Unit 3 Circulatory System

Circulatory organs, blood circulation, histology and functions of blood, blood coagulation, blood transfusion, blood groups, blood pressure, lymph and lymph glands, spleen. Immune system (basic idea of immunocytes and immunity).

Unit 4 Excretory System

Excretory organs, finer structure of mammalian kidney, ultrafiltration and urine formation, an elementary idea of dialysis.

Unit 5 Nervous System

Central nervous system, peripheral nervous system, autonomous nervous system, sense organs, reflex action.

Unit 6 Skin and skeletal System

(a) Skin: Basic structure and functions of skin.

(b) Skeletal System: All major bones in human skeleton and their role in protection and/ or, movements, types of joints.

Unit 7 Endocrine system (Chemical Regulation)

Endocrine glands, nature and role of hormones, an elementary knowledge of Pheromones.

Unit 8 Reproductive System

Male and Female reproductive organs, histology of gonads, fertilisation, artificial insemination, ovarian cycle, fertility control, in vitro fertilisation and its prospects, Twins-monozygotic and dizygotic.

Suggested Teaching/Learning Hints Read about the concept organ transplant which is coming up as growing area in the field of human physiology.

MODULE 5 : REPRODUCTION AND DEVELOPMENT

Study Time : 30 hrs **Marks :- 10**

Approach

This module is designed to highlight the diverse methods of reproduction in living beings from very simple binary fission among unicellular organisms to complex sexual reproduction in plants and animals. It deals with both normal and abnormal development.**Pre-requisite knowledge** An elementary understanding of the organs of reproduction in plants and animals.

Unit 1 Reproduction in non-flowering plants

Reproduction patterns in *Escherichia coli, chlamydomonas, Spiro gyra, Rhizopus, Funaria, Dryopteris, Pinus.*

Unit 2 Reproduction in flowering plants

Juvenility, flowering, flower as a reproductive organ, flower formation and sex expression, pollen and ovule, pollination, fertilization, seed development, fruit development, pathenocarpy.

Unit 3 Vegetative reproduction in plants

Bulb, tuber, rhizome, bulbil, runner, sucker, etc. Special method culture (micropropagation).

Unit 4 Patterns of reproduction in animals

Asexual reproduction by fission, fragmentation and budding. Sexual (gametic) reproduction.

Unit 5 Basic features of embryonic development in animals

Gametogenesis, sperm and egg, general principles of fertilization, cleavage, blastulation, gastrulation organogenesis, morphogenesis and differentiation.

Unit 6 Embryonic nutrition in birds and mammals (human)

Structure of hen's egg, role of albumen, yolk and the extra embryonic membranes (amnion and allantois). Implantation and placenta in humans.

Unit 7 Some special aspects in Developmental Biology

Growth and regeneration, cancer, ageing (senescene).

SuggestedTeaching/Learning Hints Environmental influence on the embryo should be discussed while explaining embryonic development in order to highlight that a pregnant woman can help ensure the well being of the developing foetus.

Suggested Extended Learning : Read about articles on artificial insemination, in-vitro fertilization and other such areas in magazines and newspapers.

MODULE 6: HEREDITY AND GENETICS

Study Time : 30 hrs **Marks : 10**

Approach

This module describes the principles and mechanisms of heredity in determining the characteristics of organisms. It highlights the interaction of genetics and environment in the processes involved in the development of organisms, with special reference to humans. It also deals with Variation which is the result of genetic and/or environmental factors.

Pre-requisite knowledge Basic understanding of the cell structure and cell division.

Unit 1 Principles of Inheritance

Mendel's Law of Inheritance.

Linkage and crossing-over, criss-cross inheritance.

Unit 2 Gene expression and Interaction

One gene one enzyme hypothesis, Incomplete dominance, lethal genes, pleiotropic genes, Polygenic inheritance with example of skin colour in man.

Unit 3 Physical and Chemical basis of Heredity

Basic structure of DNA and RNA, nucleotides and nucleosides, Functions of nucleic acids, replication of DNA, transcription and translation.

Unit 4 Mutation

Definition of mutation, Mutagens-physical and chemical and their effects, Useful and harmful effects of mutation.

Unit 5 Human Genetics

Problems and modern approach to human genetics, human karyotypes, Autosomal and sex chromosomal abnormalities.

Abnormalities due to multiple sets of genomes. Colour blindness haemophilia disorders due to incompatibility of genes.

Rh-factor, ABO blood groups, Amniocentesis.

Unit 6 Genetics and Society

Improvement of plants and animals by selective breeding, gene pool, genetic counselling, genetic engineering and its importance, somatic hybridization and cloning.

Suggested Teaching/Learning Hints Distinction between DNA and varieties of RNA should be discussed.

Social and ethical problems raised by artificial mutagens may be considered.

Suggested Extended Learning Read about 'Genetic drift' with changes in gene frequency by some events.

Read about the contributions of the Nobel Prize winner Hargobind singh Khurana.

MODULE 7 : POPULATION EXPLOSION AND FAMILY PLANNING

Study Time : 10 hrs **Marks : 4**

Approach

This module is designed to bring out the fact of the increase in human population all over the world through the prehistoric and historic times. It aims in providing awareness of the causes and dangers of population explosion in the more recent times. Also it provides adequate information about the methods of family planning and birth control and to remove misconceptions about human birth.

Unit 1 Concept and Definitions

Definitions of population, birth rate, death rate, growth rate.

Unit 2 Trends

Trends in world population and Indian population.

Unit 3 Reasons

Reasons for increased rate of population rise in India

Unit 4 Consequences of overpopulation

Unit 5 Control of Population growth

Importance, need for educating both male and famale adolescents, Higher age of marriage, need for use of contraception during the reproductive age.

Unit 6 Methods of Contraception

Reversible Spacing, Natural, Barrier, Hormonal (Pills and implants,) Devices, Devices plus Hormonal. **Irreversible** Tubectomy, Vasectomy, No-scalpel Vasectomy. Possibility of making reversible contraception.

Suggestion Extended/Learning Hints Find out about the methods and techniques adopted by a demographer in the population studies.

MODULE 8 : ENVIRONMENTAL BIOLOGY

Study Time : 15 hrs **Marks : 8**

Approach

This module emphasises the basic understanding of rules governing the interrelationships in a biotic community. It brings out the basic principle of conservation by pointing out that conservation of natural resources would brighten the prospect of future of mankind. The quality of human life should be improved without disturbing the natural ecosystems.

Unit 1 Ecological Principles

The biotic and abiotic factors in an ecosystem, dependence of plants and animals on their environment, inter-dependence of plants and animals; flow of energy through the biosphere, food chains and food webs, preservation of representative natural ecosystem. Man's place in environment (a general idea).

Unit 2 Spatial Distribution of plants and animals

Biomes General characteristics of the climate and the flora and fauna of the different biomes.

Unit 3 Conservation and use of Natural Resources

(a) Non-Renewable Resources: Primary energy resources and their consumption fossil fuels, minerals.

(b) Renewable Resources-water, wood, natural, pastures.

Conservation of Soil and Water Causes and methods of prevention of soil erosion, fertilizers and manures.

Water management and irrigation.

Conservation of Wild Life Forest and their conservation, endangered species, National parks in India.

Agencies dealing with conservation and wild life sanctaries.

Non conventional sources of Energy Hydropower, wind energy, nuclear power, solar energy, biogas, geothermal energy.

Unit 4 Pollution

Causes, prevention and remedy of different kinds of pollution-air, water, soil, thermal and noise.

Unit 5 Radiation in relation to human life

Kinds of radiation, harmful effects of non-ionising (ultraviolet) and ionising (X-rays, gamma rays and p-particles) radiations, their short term and long term effects, nuclear fall out, strontium-90 and its harmful effects.

Suggested Extended/Learning Hints Collect information about the recent legislation pertaining to conservation of natural resources from newspaper and magazines.

OPTIONAL MODULES

1. TOOLS AND TECHNIQUES IN BIOLOGY INCLUDING LABORATORY TECHNIQUES

Study Time : 30 hrs **Marks : 14**

Approach

This module is designed to enable the learner to familiarise herself/himself with the common laboratory techniques that may help him/her to maintain and look after a biological laboratory from the point of view of teaching as well as research. It includes maintenance of laboratory equipment and precautions necessary to be observed while working in a laboratory.

Unit 1 Short history of invention of simple and compound microscopes.

Unit 2 Basic principle of electron microscope, phase contrast microscope, cytochemistry, autoradiography, paper chromatography, tissue culture, centrifugation.

The historical resume to bring out the origin and growth of biology should be discussed briefly.

Unit 3 General laboratory equipments :-

Thermostats, pH meter, autoclave, calorimeter, distillation units, centrifuge, weighing balance, microtomes, blood pressure instrument, Kymograph.

Unit 4 Preparation of common stains and reagents

Types of stains and reagents, materials required, steps involved.

Unit 5 Maintenance of Botanical garden and Zoological museum aquarium, Herbarium and Green house.

Unit 6 Some techniques

Collection and Methods of culturing organisms for class work, Laboratory care of animals.

Suggested Extended Learning :- Maintenance of laboratory equipments should be discussed.

Precautions that are necessary to be observed while working in a laboratory should also be stressed.

2. ECONOMY BIOLOGY

Study Time : 30 hrs **Marks : 14**

Approach

This module highlights human dependence on agriculture to provide cereals, pulses, beverages, fruits and vegetables for food, fibres of different kinds for clothing and medicine to treat different diseases. The importance of forests and different products obtained from forest plants is also highlighted. Some of the common principles and practices in raising and rearing a variety of animals for their commercial products such as milk, fishes, pearls, silk, lac etc. are discussed. The concept of using vermiculture as a means of biodegradation leading to production of good manure is described.

Unit 1 Agriculture : Human dependence on agriculture:- Different kinds of Crops; cereals, oil seeds, sugarcane, fibres (cotton, flax, jute, leaf fibres coconut fibres,) cotton and jute, vegetables pulses and fruits-Green revolution, farm management including irrigation, storage, marketing of the product kitchen gardening.

Beverages :- Sources, processing and nutritional value of coffee, tea, coco, soya milk.

Unit 2 Mushroom culture, Floriculture and Hydroponics:- Brief information about each of these methods.

U**nit 3 Medicinal Plants** Concept of general value of - Amla, Mahua *Cinchona, Atropa belladona, Pinus, Pterocarpus, Opium, Datura, Ocimum, Eucalyptus, Rauvolfia, Neem.*

Unit 4 Forest Wealth Importance of forest, different products-paper, plywood, rubbergums, resin.

Unit 5 Animal Husbandry General principles of raising and caring of animals useful for human, proper management for their products like milk, butter, ghee, meat, hides, wool, leather. Poultry farming.

Unit 6 Fisheries An elementary idea of fresh water and marine fisheries. Different kinds of common edible fish-their rearing and breeding. Pearl fisheries.

Unit 7 Apiculture and Lac Culture General acquaintance with bee keeping and honey extraction, uses of honey and wax. An elementary idea of lac insect and lac production.

Unit 8 Sericulture and Vermiculture:- A general idea about sericulture, different kinds of silk moths, their rearing and silk reeling. Types of silks. Idea of rearing of economically useful worms like earthworm.

3. HEALTH SCIENCES

Study Time : 30 hrs **Marks : 14**

Approach

This module aims at creating awareness regarding the need of proper hygiene for maintenance of individual health. It also imparts knowledge regarding the need for a healthy social environment around a person. The role of proper and balanced nutrition to prevent nutritional deficiency diseases is also highlighted. The types, causes and modes of transmission of human diseases, the common symptoms, prevention and methods of control of some common communicable diseases are discussed. Non-Communicable diseases and their causes are also highlighted. It also attempts to create awareness about the symptoms and prevention of sexually-transmitted diseases.

Unit 1 Concept of Health and Hygiene Definiation and meaning of health, need for good health/concept of ill health, concept and importance of hygiene for maintenance of good health.

Unit 2 Nutrition and Health Nutrition, macro and micro nutrients, sources of nutrients need for balanced diet, calorific needs of persons in various occupations; nutrition during pregnancy and lactation.

Unit 3 Nutriotional disorders Kwashiorkor, Marasmus, disorders due to mineral deficiency namely iron, iodine and calcium; disorders due to vitamin deficiency; overeating-obesity; risk of intake of overdoses of iron and vitamin.

Unit 4 Dangers of Drug Addiction Harmful effects of addictive drugs and beverages; rehabilitation of a drug addict.

Unit 5 Hygiene Types of hygiene - personal, domestic, community with emphasis on social nuisances like spitting, nose-picking, urination, defaecation, throwing garbage and other common insanitary habits.

Unit 6 Disease Disease, its definition, types, transmission of disease, parasite, pathogen, infection, infestation, vector, carrier, host.

Unit 7 Communicable Disease Categories, communicable diseases with examples; causes and common symptoms prevention and control of some common communicable diseases-Chicken pox, Measles, Polimyelitis, Hepatitis, Rabies, Bacterial Dysentery, Diphtheria, Cholera, Tuberculosis, Leprosy, Malaria, Typhoid, Amoebiasis, Filariasis, Transmission of disease (e.g. German Measles) during pregnancy.

Unit 8 Non-Communicable disease Heart disease, Hypertension, Diabetes, Arthritis, Osteoporosis, Cancer and Allergy.

Unit 9 Sexually Transmitted Diseases Syphilis, Gonorrhoea, AIDS - awareness, symptoms and prevention.

4. EMMERGING AREAS IN BIOLOGY - BIOCHEMISTRY, BIOTECHNOLOGY AND IMMUNOLOGY

Study Time : 30 hrs **Marks : 14**

PART A Biochemistry

Approach

This module is intended to make the learner understand that all living beings are the outcome of chemical activities. It describes the nature of various biologically important molecules such as water, amino acids as well as the structure and function of the macromolecules such as the proteins, lipids and nucleic acids.

Unit 1 Introduction to Biochemistry:- Elements found in living organisms.

Unit 2 Simple biologically important Molecules water, amino acids, sugars, (pentoses and hexoses), fatty acids, aromatic bases.

Unit 3 Macromolecules Structure and function of carbohydrates, proteins and lipids.

Conjugated proteins (e.g. glycoprotein, phospholipids)

Unit 4 Metabolism of carbohydrates, proteins and lipids Regulation of metabolism

Unit 5 Translation and Transcription

PART B : Biotechnology

Approach

Biotechnology is emerging as an exciting endeavour of human technological excellence in Biology. This module provides ideas about the manipulation of genetic makeup (genetic engineering) in order to harvest important biological products, useful transgenic organisms and normal genes for gene therapy.

Unit 1 Uses of biological processes in industry Use of fermenting yeast to produce alcohol used as beverages and in industry, yoghurt production, use of micro-organisms in production of antibiotics.

Unit 2 General idea of Genetic Engineering Manipulation of genetic make-up to produce cheaply and on a large scale proteins and hormones (insulin, blood serum, proteins etc.) and other products of commercial and medical importance.

Unit 3 General idea of Transgenic Organisms Basic concept of transgenic organisms, Transgenic animals (with one example), Importance of transgenic organisms.

Unit 4 Biogas Production Use of microbes in producing biogas.

Unit 5 Gene therapy in humans:- Insertion of good genes into humans to counteract harmful mutation and treat disorder such as diabetes, sickle-cell anemia, etc.

PART C : Immunobiology

Approach

Immunobiology is a fast growing field in Biology. The humans are constantly faceing various kinds of infections. Such infections most often are counteracted and not allow to flourished inside the body by an efficient immune system. Whenever the

immmune system for one reason or the other reason get weakened then the particular disease appear. In this way the importance of immune system is being realised. In this module you will be able to gain an insight into this immune system and learn about its intricacy.

UNIT 1 Introduction Types of defense mechanisms in the body

(i) Skin, mucous membrane of eyes, nose etc.

(i) Immune system.

Unit 2 Tissues and organs involved in the immune system Cell types involved (T cells, B

cells, macrophages)

Unit 3 Definition of antigen, antibody General account of humoral and cell mediated immune response

Unit 4 Types of immunity:-
Natural

Acquired : active and passive

Unit 5 Active Immunization (vaccines):- List of vaccines available against diseases.

Unit 6 Effect of HIV on immune system.

Unit 7 Definition of Allergens

PRACTICAL WORK

Purpose

The purpose of teaching biology is not only to acquaint the learners with biological terms, facts, concepts and principles but also to develop practical skills. Development of practical skills leads to better understanding through first hand experience and mutual reinforcement. It takes into account the development of psychomotor skills. Since this is an important aspect of development, the present biology course considers practical work as an integral part of the theory.

The skills which the present course intends to develop are :-

(i) observational skills in the form of identifyig relevant details in given specimens, locating the desired parts in a dissection or specimen.

(i) manipulative skills in the form of arranging, handling and reading apparatus and instruments.

dissectional skills.

collecting, mounting and preserving skills.

drawing, labelling and reporting experimental results and thereby interpreting it.

List of Practicals

A) For Core Modules

1. Preparing stained glycerine mounts of
   i) Epidermal peel of onion, squamous epithelium of frog, squash preparations of root tip of onion to show mitotic stages.
   i) Collenchyma, sclerenchyma, parenchyma from transverse sections of petiole (preferably Datura)
   i) Xylem and phloem from a cucurbit stem by cutting transverse section
   iv) Striated and non-striated muscle (cockroach)
2. Demonstration of the structure of root, stem, leaf (of both dicot and monocot) with the help of prepared slides.
3. Study of cartilage, bone (mammalian long bone), blood (frog and man) and sections of liver, kidney, testis, ovary and skin of mammal (from prepared slides).

4. To perform experiments to demonstrate and/ or determine

   i) Osmosis in potato/carrot

   i) Plasmolysis in *Rhoeo/Tradescantia* leaf

   i) Stomatal count and its correlation with transpiration from the two surfaces in a bifacial leaf using cobalt chloride paper.

   iv) Rate of photosynthesis in *Hydrilla* (or any other aquatic plant) in normal, green and red lights (by counting the number of bubbles liberated per minute).

   v) Evolution of CO_2 during germination of seeds;

   vi) Action of salivary amylase on starch;

   vi) Chemical test of abnormalities in urine (sugar and albumin)

5. Examination of prepared slides/specimens to study the life history of the following

   i) *Chalmydomonas* (vegetative)

   i) *Spirogyra* (vegetative and conjugation)

   i) Mucor/*Rhizopus* (all stages)

   iv) Moss *(Funaria)* Gametophyte and Sporophyte

   v) Fern *(Pteris/Dryopteris)*-Prothallus, Sporophyte, Sporangium

   vi) *Pinus*-Long and Dwarf Shoots, Male and Female Cones, Slide of Pollen Grains.

   vi) Flowering plant-study of floral parts of China Rose/Holly Hock and petunia, their floral formulae and floral diagram.

6. Identification with distinguishing features and classification upto classes, of the following:-

   Paramecium, Sponge, *Hydra,* Tapeworm, Liverfluke, Leech, Butterfly/Moth, Housefly, Scorpion, *Pila,* Starfish, Dogfish, Rohu, Toad, Wall-Lizard, Snake, Pigeon, Bat.

7. Identification of life history stages of silk moth.

8. Identification of frog-egg, cleavage, blastula, gastrula, neurula (whole mount or section from prepared slides), tadpole.

9. Demonstration of live sperm from rat.

10. Dissection/Demonstration of the general viscera of rat to expose and flag label the following parts:

    Stomach, appendix, liver, spleen, pancreas, diaphragm, heart, dorsal aorta, kidney, adrenals, testis/ovary.

PRACTICAL EXAMINATION

There will be a practical examination of 3 hours duration and Maximum marks 20, apart from the theoretical examination. The distribution of marks is as follows:-

	MARKS
(i) Performing an experiment	4
(i) Submitting a project	2
(i) Identification of given samples (4 samples)	3
(iv) Preparing mounts	3
(v) Maintenance of Record Book	3
(vi) Viva Voce	5
.....	
	20
.....	

SYLLABUS
(Business Studies)

1. RATIONALE

The trend today in business is towards globalization. The entire world has become one big market. Development in transportation and communication has played a significant role in unifying varrious countries of the world. Business activities play avital role in the development of a country. Its increasing contribution to production of goods and services measures the level of growth in an economy.Today goods are produced and sold in anticipation of demand. Business as an activity has become more complex and sensitive. It is also exposed to greater risks and uncertainties. Hence the activity requires a systematic learning and professional handling.

The current syllabus is designed to cater to the needs of National Open School students in various areas of business studies. It aims at creating an interest and understanding in the area of trade, and its auxiliaries, management, finance, and marketing and would enable the students to acquire the necessary knowledge and skills. The scope of business as a career is also highlighted.

The entire course content is divided into core and

optional modules. Learning experiences considered essential for business studies are described in core modules, whereas practice oriented areas have been covered in optional modules.

The optional modules of the syllabus are based on vocational areas e.g. office procedures and practices, banking, setting up factories, and agency services. The modules would help the learners to enter the world of employment/self-employment by creating an interest in them for vocational activities.

DISTRIBUTION OF MARKS

S.NO.	CORE MODULES	MARKS	HOURS
1.	Introduction to Business	16	40
2.	Business as a Career	8	10
3.	Trade and Service Activities	16	40
4.	Management of Business	16	40
5.	Financing of Business	12	30
6.	Marketing	12	30

OPTIONAL MODULES

CHOOSE ANY ONE OUT OF FOUR MODULES

7.	Office procedures and Practices		
8.	Practical Banking	20	50
9.	Introduction to Factory Set-up		
10.	Agency Services		
	Total	**100**	**240**

AIMS AND OBJECTIVES OF THE COURSE

GENERAL OBJECTIVES

1. The main objectives is to prepare the learners for

activities related to trade and commerce.

2. To enable the learners to acquire knowledge, understanding and skill in business and management.
3. To create an interest in trade and auxiliaries and various kinds of services.
4. To educate the learner about the role of business in the economy and its social obligation to the community.

SPECIFIC OBJECTIVES

1. To acquaint the learner with the nature and scope of business and form of business organisation and its suitability.
2. To make them aware about the concept oftrade-internal and external and activities auxiliary to trade.
3. To develop in them awareness about managerial skills like planning organising, staffing, directing and controlling.
4. To make them understand the concept of business finance sources (long-term, short-term), financial institutions and their services.
5. To develop in them the understanding of marketing, channels of distribution, sales promotion, advertising and personal selling.
6. To make them aware about avenues of employment, career development and self-employment, office procedure and practices, functions of commercial funds, factory set-up and agency services.

CORE MODULES

MODULE-I: INTRODUCTION TO BUSINESS

TIME: 40 HOURS MARKS: 16 APPROACH:

This module is designed to acquaint the learners with the nature and scope of business, and the different forms of business organisations.

PRE-REQUISITE KNOWLEDGE:

Understanding of human activities and knowledge of various forms of business organisation.

CONTENT UNITS

Unit. 1 Nature and scope of Business.

Unit. 2 Forms of Business Organisation:

Sole Proprietorship, Joint Hindu Family, Partnership, Joint Stock Company, Co-operative Society-characteristics.

Suitability of different forms of Business organisation.

MODUL- II: BUSINESS AS A CAREER

TIME : 10 HOURS MARKS : 8

APPROACH:

This module explains business as a career, need for employment, avenues of employment and concept of self-employment. It analyses and identifies various jop opportunities in offices and business in general. It also describes the procedure of establishing a small enterprise.

PRE-REQUISITE KNOWLEDGE :

Understanding of the nature and scope of business.

CONTENT UNITS :

Unit. 1 Concept of career, need for employment. Avenues of employment and career in business through wage-employment.

Unit. 2 Self - employment in business and

qualities required for success in business.

Unit. 3 How to establish a business enterprise.

MODULE-III : TRADE AND SERVICE ACTIVITIES

TIME : 40 HOURS **MARKS: 16**

APPROACH:

This module is designed to familiarise the learner with the importance of the different types of trade and its auxiliaries

PRE-REQUISITE KNOWLEDGE:

General knowledge of various concepts of trade and its auxiliaries.

CONTENT UNITS:

Unit. 1 Trade and auxiliaries to trade.

Unit. 2 Internal Trade: Meaning of Retail and Wholesale Trade, Services of wholesaler and Retailer.

Specialised Retailing Agencies: Departmental Stores, Multiple Shops, Mail Order Houses, Super Bazars - their characteristics, merits and demerits.

Unit. 3 External Trade: Procedure of Export and Import Trade, Main documents usedin Foreign Trade.

Unit.4 Service Activities: Transport, Communication, Postal Services, Banking and Insurance.

MODULE-IV : MANAGEMENT OF BUSINESS

TIME: 40 HOURS **MARKS: 16**

APPROACH:

This module is designed to acquaint the learners with the concepts, general principles and functions of business management.

PRE - REQUISITE KNOWLEDGE:

General idea about management and role of managers.

CONTENT UNITS

Unit. 1 Introduction to Management: Definition, nature and scope of management, concept of scientific management and principles of general management.

Unit. 2 Planning: Meaning and process.

Unit. 3 Organising: Process of organising.

Unit. 4 Staffing: Recruitment and Selection of employees, their training and development, appraisal and promotion.

Unit. 5 Directing: Meaning and importance of communication, motivation, leadership and supervision.

Unit. 6 Co-ordination and Controlling: Meaning and process.

MODULE-V: FINANCING OF BUSINESS

TIME : 30 HOURS **MARKS : 12**

APPROACH:

This module is to introduce the learner with different sources of finance and financial institutions.

PRE-REQUISITE KNOWLEDGE:

General understanding of the basic concepts of financing of business.

CONTENT UNITS :

Unit. 1 Introduction to Business Financing.

Unit. 2 Sources of Short-Term Finance - Nature and characteristics.

Unit. 3 Sources of Long-Term Finance-Nature and characteristics.

Unit. 4 Role of Specialised Financial Institutions-Objectives and functions of IFCI,IDBI, ICICI, UTI and SFCs, related to financing of business.

MODULE-VI : MARKETING

TIME : 30 HOURS **MARKS: 12**

APPROACH:

This module is designed to acquaint the learners with various elements of marketing mix.

PRE- REQUISITE KNOWLEDGE :

General idea of market, marketing, advertisement and selling.

CONTENT UNITS:

Unit. 1 Meaning, objectives, nature and scope of marketing.

Unit. 2 Marketing mix.

Unit. 3 Channels of distribution.

Unit. 4 Sales promotion.

Unit. 5 Advertising.

Unit. 6 Personal selling.

OPTIONAL MODULES

CHOOSE ANY ONE OUT OF FOUR

MODULE-VII : OFFICE PROCEDURES AND PRACTICES

TIME : 50 HOURS **MARKS: 20**

APPROACH:

This module is designed to acquaint the learners with the concept of office and its set-up, various office activities and use of office equipment and machines.

PRE-REQUISITE KNOWLEDGE :

General understanding of office functions.

CONTENT UNITS:

Unit. 1 Nature and Functions of office.

Unit. 2 Office set-up: Type of Jobs in a modern office.

Unit. 3 Handling inward and outward mail.

Unit. 4 Systems of filing and indexing.

Unit. 5 Office equipments and machines.

MODULE-VIII : PRACTICAL BANKING

TIME : 50 HOURS **MARKS : 20**

APPROACH:

This module is designed to acquaint the learners with various transactions and services of commercial banks.

PRE-REQUISITE KNOWLEDGE : General idea about banks and their functions.

CONTENT UNITS :

Unit. 1 Nature and Scope of Banking. Types of Banks.

Unit. 2 Unit. 3 Functions of Commercial Banks.

Opening and operating of Deposit Accounts.

Unit. 4 Unit. 5 Loans and Advances.

Other Banking Services.

MODULE-IX : INTRODUCTION TO FACTORY SET-UP

TIME : 50 HOURS **MARKS : 20**

APPROACH:

This module is designed to acquaint the learners with the service , working conditions and provisions of health, safety, and welfare measures in factories.

PRE-REQUISITE KNOWLEDGE

General understanding of the concept of a manufacturing unit.

CONTENT UNITS:

Unit. 1 Nature and characteristics of factories.

Unit. 2 Health and welfare measures in factories.

Unit. 3 Safety measures in factories.

Unit. 4 Working and service conditions in factories.

MODULE-X : AGENCY SERVICES

TIME : 50 HOURS **MARKS : 20**

APPROACH:

This module identifies the key activities involved in rendering various agency services. It also acquaints the learner with relevant documents and proforma.

PRE-REQUISITE KNOWLEDGE:

General idea about various agency services and their relationship with business.

CONTENT UNITS

Unit. 1 Meaning, characteristics and importance of Agency Services.

AGENCY AVENUES

Unit. 2 Types of Agency Services. Insurance Agency, Saving Agency, Advertising Agency, Tours and Travel Agency, Property Agency, Couriers andPacking Agency.

Unit. 3 How to secure agencies?

- Insurance Agency.
- Saving Agency.
- Tours and Travel Agency.

NORTH EAST NATIONAL BOARD OF SCHOLL EDUCATION
Senior Secondary Curriculum in Chemistry

RATIONALE

According to present scheme of school education at Senior Secondary stage, chemistry emerges out as a separate discipline. It is this stage where major emphasis is to be laid on providing suitable conceptual foundation.

The present chemistry course has been developed basically around the themes: Why to chemical reactions occur? What is the quantitative relationship among reacting constituents in a chemical reaction? How far and how fast will a chemical reaction proceed under a given set of conditions? Can we predict whether a chemical reaction will occur or not? What is the relation between the structure of a chemical substance and its functions/properties? In what way is a chemical reaction relevant for getting new types of substances and materials for daily life and chemical industries?

In the present course, there is no compartmentalization like physical, inorganic and organic chemistry. However basic chemical concepts considered necessary in the study of descriptive chemistry (inorganic and organic) are provided in the beginning of the course and an effort has been made to provide a disciplinary structure to chemistry and, therefore,a logical sequencing of concepts is provided. Applications of chemistry in daily life have been interwoven with the conceptual themes in such a way that learners can appreciate the importance of the study of chemistry relevant to daily life and in the economic development of the country. Some interdisciplinary aspects have also been provided to make the course more meaningful and functional.

OBJECTIVES OF THE COURSE

At the end of the course, it is expected that a learner will be able to:

- Understand the principles, theories and laws of chemistry responsible for various chemical processes/reactions,
- Realize the role of chemistry in production of many elements (metals/non-metals) and compounds useful in industries and daily life.
- Appreciate the chemical nature of inorganic and organic substances around him/her,
- Choose various vocational, professional and applied course of his/her choice based on knowledge of chemistry gained.

Apart from this, the present course also aims at developing the following in the learner:

- Perform chemical calculations to know about the chemical reactions and chemical compounds,

- Explain chemical reactions, concepts and phenomenon,
- Develop awareness about uses and abuses of chemical substances,
- Develop skills like arranging/setting apparatus, handling apparatus and chemicals properly, and
- Analyse and synthesise simple compounds.

SPECIAL FEATURES OF THE COURSE

The course also provides optional modules 'mostly of applied nature' out of which a student can choose one module according to his/her choice of career. Thus, there are seven course modules and five optional modules. A student appearing for senior secondary examination is expected to offer all the seven core modules, one module out of five optional modules, and practicals. All the core and optional modules are listed below:

CORE MODUELS

S.No.	Module Study	Marks Alloted	Hours
1.	Atoms, Molecules and Stoichiometry	7	14
2.	States of Matter	7	18
3.	Chemical Energetics	8	23
4.	Chemical Dynamics	7	19
5.	Structure of Atoms and Chemical Bonding	11	33
6.	Elements and Their compounds	15	48
7.	Chemistry of Organic Compounds	15	48

OPTIONAL MODULES

1.	Agricultural Chemistry	10	37
2.	Bio-Chemistry		
3.	Environmental Chemistry		
	Total	80	240

A detailed curriculum is given for your ready reference

CORE MODULES

MOUDLE 1 : ATOMS, MOLECULES AND STOICHIMOMETRY

Unit 1 Measurements in Chemistry

- A simple idea of basic SI units

- Derived SI unit
- Numerical Problems

Unit 2 Mole Concept

- Counting and weighting of atoms and molecules
- Avogadro constant
- Molar quantities
- Numerical problems

Unit 3 Chemical Stoichimoetry

- Empirical and molecular formulae
- Chemical formula and percentage composition (chemical formula from percentage composition and vice versa)
- Mass relationship in chemical reactions (mole ratio from a balanced chemical equation, mole calculation)
- Limiting reagent concept and percentage yield.
- Numerical problems

MODULE 2 : STATES OF MATTER

Unit 1 Behaviour of Gases

- The gaseous state
- Boyle's Law
- Charles' law-kelvin Temperature Scale
- Avogadro's principle
- Dalton's law of partial pressures
- Ideal gas equation
- The kinetic molecular theory of gases
- Graham's low of diffusion
- Real gases-deviations from ideal gas behaviour.
- Liquifaction of gases
- Numerical problems

Unit 2 Liquids and Solids

- The liquid state
- The solid state

Unit 3 Solutions

- Solution, solute and solvent
- Concentration of solutions, - molarity molality, normality, mole fraction and mass percentage
- Types of solutions
- Raoult's law
- Ideal and non-ideal solutions
- Colligate properties of solutions simple numerical problems.
- Simple numerical problems

Unit 4 The Colloidal Solution

- True solution, colloidal solution and a suspension
- Classification of colloids
- Preparation of colloidal solutions
- Properties of colloidal solutions
- Properties of colloidal solutions
- Applications of colloids

MODULS 3 : CHEMICAL ENERGETICS

Unit 1 Some Basic Concepts of Thermodynamics and Thermochemstry

- System : Isolated, closed and open system
- Processes; isothermal, adiabatic, reversible and irreversible
- Standard state of a substance
- Exothermic and endothermic reactions
- Thrmochemical equations
- Concept of internal energy and enthalpy change, relationship between rH and rE, first law of thermodynamics
- Standard enthalpy of reactions
- Enthalpy changes during a reaction: enthalpy of formation, enthalpy of combustion, enthalpy of neutralization
- Hess's law and its applications
- Bond enthalpy
- Numerical Problems

Unit 2 Spontaneity of Chemical Reactions

- Concept of entropy, entropy change in a system and spontaneity
- Relationship between G,H and S
- Free energy change and spontaneity of a Chemical reaction
- Standard free energy of formation
- Free energy change and chemical equilibrium
- Numerical problems

MODULE 4 : CHEMICAL DYNAMICS
Unit 1 Chemical Equilibrium

- Reversible reactions
- Types of equilibrium system
- Equilibria in homogeneous and heterogeneous systems
- Law of chemical equilibrium
- Relationship between Kc and Kp
- Factors affecting equilibrium – Le Chatelier's Principle
- Numerical problems.

Unit 2 electrochemistry

- Electrolysis
- Electrical conductivity of electrolytic solutions
- Electrochemical cells
- Standard electrode potential
- Electrochemical series and its applications
- Effect of concentration on electrode potentials by Nernst equation
- Relationship between emf and free energy
- Numerical problems

Unit 3 Rates of Chemical Reactions

- Rate of a Reaction
- Expressions for reactions rates
- Factors affecting rate of reaction
- Rate law
- Order of a reaction
- First order reaction
- Half life period
- Effect of temperature on reaction rate
- Catalysis
- Numerical problems

Unit 4 Ionic Equilibria

- Acid-base equilibrium
- Ionisation constant of weak acids and bases
- Ionization of water
- pH value
- buffer solutions
- solubility equilibrium, solubility product and its applications
- numerical problems

MODULES 5 : STRUCTURE OF AN ATOM AND CHEMICAL BONDING

Unit 1 Atomic Structure

- Fundamental particles of an atom
- Scattering of particles-Rutherford's experiment
- Discovery of neutron
- Discharge of electricity through gases
- Rutherford's nuclear model
- Electromagnetic radiation
- Visible spectrum
- Line spectra of H-atom; Bohr model (no derviation)
- Wave-particle duality
- The uncertainity principle
- The wave mechanical model-orbitals (probability picture may be emphasized), quantum number and Pauli's exclusion principle
- Aufbau Principle-electronic configuration of atoms.
- Hund's rule

Unit 2 Period Table and Variation in Atomic Properties

- Early attempts of classification
- Long form of periodic table
- Variation in atomic properties

Unit 3 The Chemical Bond -I

- Why do atoms combine (potential energy diagram)
- Formation of ionic bonds, characteristics of covalent compounds, partial ionic character of covalent bonds, coordinate covalent bond.

Unit 3 The Chemical Bond – II

- Shapes of molecules. An introduction to VSEPR theory (upto 6 electron pairs only)
- Hybridization of atomic orbitals, hybrid orbitals (sp, sp , sp)
- Multiple covalent bonds

MODULE 6 : ELEMENTS AND THEIR COMPOUNDS

Unit 1 general characteristics of Main Group Elements

Variation in properties among s and p block elements with respect to (i) size (ii) ionization energies (iii) electron affinities (iv) electronegativity (v) metallic behaviour, variation in the nature of their (i) hydribes (ii) oxides and halides, diagonal relationship between elements (Li and mg only)

Unit 2 General Characteristics of Transition Elements

Electronic configuration, properties of d-block elements (first series only) in terms of their (i) variable oxidation states, (ii) magnetic properties (iii) colour of their ions and compounds (iv) complex formation and (v) catalytic properties.

Unit 3 Main-Group Elements and Their Compounds – 1

- Hydrogen
- Alkali and alkaline earth metals
- Boron and aluminium
- Carbon and silicon

Unit 4 Main-Group Elements and Their Compounds – II

- Nitrogen and phosphorus
- Oxygen and sulphur
- Halogens and noble gases

Unit 5 Chemistry of some Important Compounds of Transition Elements

Preparation, properties and application of some important compounds: $KMnO_4$, $K_2Cr_2O_7$ $K_4Fe_2(CN_6)$ $CUSO_4 5H_2O$ Calamine.

Unit 6 General Metallurgical Principles

- Occurrence of metals
- Important ores of some common elements: Na, Al, Sn, Pb,Ti, Fe, Cu, Ag and Zn
- General principles involved in the isolation of metals from their ores and refining taking examples from these metals)

MODULE 7: CHEMISTRY OF ORGANIC COMPOUNDS Unit 1 General

Principles, Classification and Nomenclature

- Classification

- Type of bond fission : Homolytic, Heterolytic
- Inductive effect,
- Types of reactions: substitution and addition (electrophonic and nucleophilic),

elimination an rearrangement
- Functional groups : definition and types
- IUPA nomenclature of monofunctional organic compounds
- Isomerism

Unit 2 Hydrocarbons

- Definition and types of hydrocarbons
- IUPA nomenclature

Unit 3 Preparation and Properties of Hydrocarbons – II

- Preparation of hydrocarbons
- Physical properties of hydrocarbons

Unit 4 Preparation and Properties of Hydrocarbons – II

- Chemical properties of hydrocarbons (addition, substitution, oxidation) **Unit 5**

Compounds of Carbon Containing halogens (Haloalkanes and haloarenes)

- IUPAC Nomenclature of hologen compounds
- Preparation of haloalkanes and haloarenes
- Physical and chemical properties

Unit 6 compounds of Carbon Containing Oxygen

- Different types of oxygen containing compounds (alcohols, ethers, aldehydes, ketones, acids, esters)
- IUPAC nomenclature of oxygen containing compounds
- Preparation and properties of alcohols, phenols, aldehydes, ketones and acids.

Unit 7 Compounds of Carbon Containing Nitrogen

- Types of compounds-amides, animes, nitro compounds
- IUPAC nomenclature of amides, amines and nitro compounds
- Preparation and properties of primary aromatic and aliphatic amines.

OPTIONAL MODULES

MODULE 1 : AGRICULUTRAL CHEMISTRY

UNIT 1 soil and Plant Nutrients

- Simple idea of soil
- Types of soil
- Soil Texture
- Soil Reaction
- Plant Nutrients

UNIT 2 manures and Fertilizers

- Essential Plant Nutrients
- Types of manures
- Compost production
- Vermicompost and vermiculture
- Types of fertilizers
- Methods of using fertilizers

UNIT 3 Pests and Pesticides

- Pests
- Pest control
- Pesticides
- Pest management

UNIT 4 Biological Nitrogen Fixation and Plant Growth Hormones

- Nitrogen cycle
- Nitrogen fixation
- Biolfertilizers
- Plant growth hormones

MODULE 2 : BIOCHEMISTRY

UNIT 1 Carbohydrates

- Natural sources of carbohydrates
- Monosaccharide, disaccharide and polysaccharide
- Structure of carbohydrates
- Biological significance of carbohydrates

UNIT 2 Proteins

- Simple idea of proteins
- Classification and structure of proteins
- Amino acids

UNIT 3 Fats and Lipids

- Lipids
- Oils and fats

UNIT 4 Nucleic Acid

- Nucleic Acid
- DNA and RNA

UNIT 5 Enzymes

- A simple idea of enzymes
- Classification of enzymes
- Uses of enzymes

MODULES 3 : ENVIRONMENTAL CHEMISTRY

UNIT 1 Environment and its pollution

- Idea of environment
- Threats to environment
- Pollutants

UNIT 2 Atmosphere, Oxygen and air Pollution

- Composition of air
- Respiration, photosynthesis and decay cycle
- Air pollutants
- Green house effect
- Global warming
- Depletion of ozone layer
- Acid rain

UNIT 3 Water Pollution

- Water resources
- Water pollutants
- Biological oxygen demand
- Prevention of water pollution

- Legislative measures for prevention of water pollution

UNIT 4 Heavy Metal Contamination

- Heavy metal
- Effects of heavy metal contamination
- Preventive measures

UNIT 5 Radioactive Waste Management

- Radioactive sources
- Ill effects of radiation
- Preventive measures
- Regulations regarding safety

CURRICULUM FOR PRACTICAL WORK IN CHEMISTRY

Objectives of the present course in practical work are as follows :

1. To develop and inculcate laboratory skills and techniques
2. To enable the students to understand the basic chemical concepts,
3. To develop basic competence of analyzing and synthesizing chemical compounds and mixtures.

To meet these objectives three different type of laboratory experiments are provided in the present practical course.

1. Experiment for developing laboratory skills/techniques
2. Concept based experiments
3. Traditional experiments (for analyzing and synthesing chemicals)

List of Practicals

1. (i) General safety measures with special reference to safe handling of chemicals.
   (ii) Acquaintance with boring of glass tubes, sealing of apparatus, filtration, distillation, crystallization, preparation calibration, cleaning of glass apparatus and use of burner, etc.)
   (iii) Measurement of volume, length, mass and density and common erros therein.

2. Preparation, collection and study of some important physical and chemical properties of at least three gases, one each from the following groups :

   (a) Hydrogen and oxygen
   (b) Carbon dioxide and hydrogen sulphide
   (c) Chlorine, hydrogen chloride, and sulphur dioxide

3. Preparation of dilute solutions of known concentration of sulphuric acid, hydrochloric acid and nitric acid. (Dilution should be carried out strictly under the supervision of a teacher).

4. Study of interaction of metals (any four) with salt solution and arranging them according to their activity (to form activity series). Metals and salts may be selected from the following.

   Mg, Zn, Fe, Sn, Pb, Cu and Al and their salts. (Checking the order of metal sin series based on the electrode potential will be desirable.)

5. (a) Determination of pH of following substances by using a universal indicator solution or pH papers.

(i) Salt solution
(ii) Acids and bases of different dilutions
(iii) Vegetable and fruit juices

(b) Study of pH change by common-ion effect in base of weak acids and weak bases by above method (specific examples of CH_3COOH and CH_3COONa and NH4OH and NH_4 OH and NH_4 CI may be taken).

6. Determination of melting point of a solid substance or low melting point (below 100^0C) by glass capillary tube method (Paraffin oil may be used as bath).

7. Study of solubility of solid substances in water at different temperatures and plotting of a solubility curve.

8. Study of the shift in equilibrium between ferric ions and thiocyanate ions by increasing/decreasing the concentration of their ions.

9.

The effect of concentration on the rate of reaction between sodium thio-sulphate and hydrochloric acid.
The effect of temperature on the rate of reaction between sodium thiosulphate and hydrochloric acid.

10. Separation of coloured substances by paper chromatography and comparison of their Rf values.

(a) a mixture of red and blue ink or a black ink.
(b) Juice of a flower or grass.

11. Detection of nitrogen, sulphur and halogens in an organic compound (combinations of halogens t be avoided). Not more than two of the above elements should be present in the given organic compound.

12. Study of simple reactions of carbohydrates, fats and proteins in pure form and detection of their presence in given food stuffs.

13. Preparation of soap by using different oils and its comparison with the market soap by determining the foaming capacity and cleaning effect.

14. Use of chemical balance to be demonstrated.

(a) preparation of solution of oxalic acid and ferrous ammonium sulphate of known molarity by weighing (non-evaluative)

(b) A study of (i) acid-base and (ii) redox titrations (single titration only). (both the solutions to be provided).

(i) Oxalic acid and sodium hydroxide
(ii) Ferrous ammonium sulphate and potassium permanganate.

15. Elementary qualitative analysis of a salt involving detection of one cationic and one anioninc species from the following groups. (Salts insoluble in hydrochloric acid excluded).

Cations:

Pb^{2+}, Cu^{2+}, Cd^{2+}, Fe^{3+} Al^{3+} Ni^{2+} Zn^{2+}
Mn , Ca NH

Anions:

Co_3^{2-}, S^{2-}, Cl^-, Br^-, I^-, NO_2 , NO_3 -, $SO4^{2-}$; $PO4^{3-}$

16. Functional groups in organic compounds

Test of unsaturation
Test for Carboxylic, phenolic, aldehydic and ketonic groups.

PRACTICAL EXAMINATION

There will be a practical examination of 20 marks and 3 hours duration.
The distribution of marks is as follows:

			Marks
Salt Analysis (one cation + one anion)			4
Velumetric Analysis			6
	(i)	(write-up in which student may be asked to write brief method, indicator, equation, end point.	2
	(ii)	Set-up of experiment	2
	(iii)	Results	2
3.	(i)	Detection of elements in an organic compound	2
	(ii)	Detection of functional group	2
OR			
Setting up of one experiment from experiments at serial number 2 to 10, 12 and 13.			4
4.	Viva-voce		3
5.	Record book		3
		Total	20

Syllabus(Computer Science)

Lesson 1

Anatomy of a Digital Computer

1.1 Introduction
1.2 Objectives
1.3 Functions and Components of a Computer
1.3.1 How the CPU and Memory work 1.4 Input devices
1.4.1 Keyboard
1.4.2 Magnetic Ink character Recognition (MICR)
1.4.3 Optical mark recognition (OMR)
1.4.4 Bar Code Reader
1.4.5 Digitigng Tablet
1.4.6 Scanners
1.4.7 Mouse
1.4.8 Light Pen
1.4.9 Speech input devices
1.5 Memory Unit
1.5.1 Capacity of Primary Memory
1.6 Secondary Storage
1.6.1 Magnetic Tape
1.6.2 Magnetic Disk
1.6.3 Floppy Disk
1.6.4 Optical Disk
1.7 Output Device
1.7.1 Display Screen
1.7.2 Printer
1.7.3 Plotter
1.7.4 Sound Cards & Speaker
1.7.5 3 D - Audio
1.8 What do you have learnt
1.9 Terminal Questions
1.10 Feedback to In –Text Question

Lesson - 2

Data Processing Concept

2.1 Introduction. 2.2
Objectives 2.3 Data
2.4 Processing 2.5
Information
2.6 Data Processing Activities
2.7 The Data Processing Cycle
2.8 Computer Processing Operation 2.9
Data Processing Systems
2.10 Data Organisation

Lesson – 3 Computer

Software

Lesson – 4

Operating System

Lesson – 5

Data Communication and Networking

1.1 Introduction
1.2 Objectives
1.3 Data Communication
1.4 Communication Protocol
1.5 Data Transmission Modes
1.6 Types of Communication Services
1.7 Communication Media Computer Network
1.8 Types of Networks Network Protocols
1.9 Network Architecture
1.10 Important terms used in Networking
1.11 What you have learn
1.12 Terminal Question
1.13 Feedback to In-Text Question
1.14
1.15

Lesson – 6

Fundamentals of Internet and Java Programming

Introduction
Objects
6.1 Internet – The History
6.2 Services of Internet – E-mail, FTP, Internet, WWW.
6.3 World Wide Web (WWW) Java and C++
6.4 Characteristic of Java
6.5 How to Java ignores after Java
6.6 Software Business after Java3
6.7 Java and the Internet
6.8 What you have learnt
6.9 Terminal Questions
6.10 Feedback
6.11
6.12

Lesson – 7

6.13 **Introduction to**

C++

1.1 Introduction
1.2 Objectives
1.3 C++ Character Set
1.4 Basic Data Types
1.4.1 Integer Type (int)
1.4.2 Floating Point type (float)
1.4.3 Character Type (char)
Tokens
Keyword
1.5 Identifiers
1.5.1 Literals
1.5.2 Punctuators
1.5.3
1.5.4

Lesson – 11

Array

Lesson 12

Structure, Type def & Enumerated Data Type

Lesson – 13

Classes & Objects with Constructors / Destructors

CURRICULUM OF SENIOR SECONDARY COURSE IN PAINTING

RATIONALE

Painting is a form of art. It is a powerful way of self-expression providing a sense of fulfillment and achievement. This course is aimed at providing with necessary inputs of practical work and skill to the learner's familiarity of the theory of art through ages. This will further help in aesthetic development, ability to appreciate and discover beauty of life and integrate it into one's own personality. Thus, art will make us more sensitive to our Cultural Heritage, environment and develop a creative attitude in day-to-day activities.

COURSE OBJECTIVES

The objectives of this course are to:

- develop knowledge and understanding of visual art;
- develop skill, ability and aesthetic attitude;
- acquaint about the development of art and various styles of art expression and their salient features;
- develop understanding about the visual aspects of composition, division of space, rhythm, texture, tonal gradation and expressive value of line in a learner;
- to work with harmony and contrast of colour, having various drawing and painting materials such as pencils, pastels, water and oil colour, ink etc.

COURSE STRUCTURE

This course in painting for the senior secondary level has been divided into three compulsory modules namely :

- History and Appreciation of Indian art.
- History and Appreciation of Indian painting and Sculptures
- Folk Paintings

It also includes one practical paper having three parts.

- Object Drawing
- Painting and Composition
- Folk Art as Motif

COURSE DESCRIPTION

Module – 1 : History and Appreciation of Indian art.
(From 2500 B.C. to 16th Century A.D.)

Approach :

The art objects, belonged to Indus Valley Civilization, are the only available earliest evidence of great tradition of India. The nature form of these art works help us to imagine that tradition of Indian art must have begun long before 2500 B.C. Changing condition of politics and religions kept on motivating Indian art through the ages from 4th C. B.C. to 16th C. A.D., leaving a missing link for approximately 1000 yrs from post Indus Valley civilization to Mauryan period. Indian Art under the patronage of Hindu, Muslim, Buddhist and Jain rulers, flourished till 16th C. A.D. to face a new era of art movement after the Mughals became the rulers of India.

Unit 1.1 Art of Indus Valley Civilization
(Harappan and Mohen-jo-daro 2500 B.C. to 1750 B.C.).

Brief introduction and appreciation supported with drawing, maps, and pictures of the following art objects:

Objects	Collection
•• Mother Goddess	National Museum, Delhi
•• Seal with Bull Design	National Museum, Delhi
•• Painted Pottery	National Museum, Delhi
•• Jewellery (necklace)	National Museum, Delhi

Supportive video programme(s) ••
Mother Goddess
•• Seal with Bull Design
•• Painted Pottery
•• Jewellery (necklace)

Unit 1.2: Art of Mauryan to Gupta Period (4th Century B.C. to 6th Century A.D.)

Brief introduction and appreciation supported with drawing and pictures of the following art objects:

Objects	Collection
•• Lion Capital	Sarnath Museum
•• Chauri Bearer (Yakshi)	Patna Museum
•• Stupa I at Sanchi	Sanchi, Madhya Pradesh
•• Lord Mahavira – Jain Tirthankara ••	National Museum, U.P.
Seated Buddha (Gandhara Style) ••	Sarnath Museum, Madhya Pradesh
Seated Buddha	Government Museum, Mathura

Supportive video programme(s)
•• Nataraja, (Cosmic dance of lord Shiva ••
Dokra Casting (Trible Bronze casting) ••
Triumph of Labour

Unit 1.6 : Indo – Islamic Architecture
(From 12th Century A.D. to 17th Century)

Brief introduction and appreciation supported with drawing, and pictures of the following heritages/monuments.

Pictures	**Place**
•• Qutab Minar	Delhi
•• Taj Mahal	Agra
•• Gol Gumbaz	Bijapur

Supportive video programme(s) ••
Qutab Minar
•• Taj Mahal
•• Gol Gumbaz

Module – 2 : History and Appreciation of Indian paintings and Sculptures (From 16th Century A.D. Pioneers to Contemporary Art Movements)

Approach :
The 16th century saw a profound change in the stylistic development of Indian art. Art of miniature painting became very popular in Rajputana and in the court of the Mughals. It also influenced the South Indian painters.

The muslim rulers were great admirers of architecture. They enriched Indian art with superb structures, including one of the wonders of the world, Taj Mahal.

Under the British rule, the character of Indian art underwent a thorough change. Beside the painters like self-taught artist Raja Ravi Verma, many Indian artists followed the realistic style of European art. On the other hand, Abanindranath Tagore and his Bengal school tried to bring back classical Indian style with contemporary themes and Jamini Roy modernised the folk style of India. Amrita Shergil, with her Parsian art education, was the most influential painter in contemporary art scene, while Rabindranath Tagore visualised the most modern aesthetics in his painting. These pioneers inspired the next generation of Indian artists to discover their identity in the filed of international art.

Unit 2.1: Mughal School
(From Akbar to Bahadur Shah II)

Brief introduction and appreciation of the following Miniature Paintings:

Paintings	**Artist**	**Collection**
• Bird catching at Baran	Bhag	National Museum, Delhi

•• Tanj ore Painting	Unknown	National Museum, Delhi

Supportive video programme(s)
•• Nizamuddin Awaliya and Amir Khusrau ••
Tanj ore Painting

Unit 2.5: Company School

Brief introduction and appreciation of the following Paintings:

Paintings	Artist	Collection
•• A group of Kashmiri Artisans	Unknown	National Museum, Delhi
•• The Bird	Unknown	National Museum, Delhi

Supportive video programme(s)
•• A group of Kashmiri Artisans
•• The Bird

Unit 2.6: Pioneers of Contemporary Art Movements in India

Brief introduction and appreciation of Paintings in the modern era :

Paintings	Artist	Collection
•• Ravana and Jatayu	Raja Ravi Varma	National Museum, New Delhi

Bengal School

•• Radhika	Abanindra Nath Tagore	National Gallery of Modern Art, New Delhi ••
Sri Chaitanaya under Garud Stambha	Nand Lal Bose	National Gallery of Modern Art, New Delhi
•• Crucifixion	Jamini Roy	National Gallery of Modern Art, New Delhi

Supportive video programme(s)
- Ravana and Jatayu

•• Radhika
•• Sri Chaitanaya under Garud Stambha ••
Crucifixion

Unit 2.7: Contemporary Arts of India

Brief introduction and appreciation of Paintings in modern era:

Paintings	NameoftheArtist	Colection
• Women Face	Rabindranath Tagore	National Gallery of Modern Art, New Delhi
•• Adornment of Bride	AmritaShergil	National Gallery of Modern Art, New Delhi
•• SanthalFamily(Sculpture)	RamKinkerBaij	National Gallery of Modern Art, New Delhi
•• Mother Teresa	M.F. Hussain	National Gallery of Modern Art, New Delhi
•• Thorn Prick	N.S. Bendre	National Gallery of Modern Art, New Delhi

PRACTICAL

Marks : 20

Part I : Object Drawing **`Study hours : 65**

(1) Object Study
(2) Nature Study

Approach:

Awareness of Fundamentals of Drawing like *space, line, tone, volume, perspective, light, and shade,* etc. through simple experimental exercises. Study of two or three simple objects including natural and geometrical be arranged together and composed on a given format either vertically or horizontally.

Simple objects based on geometrical shapes could include, for example, *jug, tumbler, basket, plate, bottle, kettle, vase, book, magazine, cup and box* etc. of a variety of materials like *terracotta, ceramics, cane, glass, paper, wood, plastic, drapery, leather and metal etc.* Natural forms locally available like *fruits, vegetables, flowers, leaves, twigs,* etc. are to be used. **Select any two or three on given objects.**

Materials to be used: Drawing paper-1/2 imperial size or (15"/11" approximate size); Various grades of pencils (soft lead); eraser; colours- Oil pastels, water colours and ink; various grades of flat / round brushes;

Part II : Painting and Composition **Study hours : 65** **Marks : 20**

(3) Fundamentals of Painting
(4) Composition
(5) Sketching from Life and Memory

Approach:

Free hand drawing directly from life of *Human Figures, Animals, Trees, Building, Interior of a Room, Bus stop, Market Place, Vehicles,* etc. Paint on a given topics like e.g. *Festival, Fair, Railway station, Man reading a book or newspaper, Playing with your pet, Eating out, Night scene, Rainy day, wedding, Gram Panchayat, Pollution,* Library, Mother & Child etc. using imagination and everyday sketches.

Starting with Basic Design and various Experiments to understand variety in forms and overlapping, their simplification, colour wheel, variety in colour, hue, tone and texture, rhythm and continuity in application, concept of far etc. **all brought together meaning fully in a composition. (Select any one on given topics).**

Materials to be used: Drawing paper-1/2 imperial size or (15"/11" approximate size); Various grades of pencils (soft lead); eraser; colours- Oil pastels, water colour andink; various grades of flat / round brushes;

SCHEME OF EVALUATION

Mode of Evaluation	Duration in hours		Marks			Parts
Theory	1½			30		1
Practical (Three Papers)	2½					
Part I : Object Drawing • Composition and Drawing • Treatment of Media • Overall impression			 8 8 4	**20**		1
Part II : Painting and Composition • Compositional arrangement including emphasis on the subject expressed • Treatment of media • Overall impression	2½	6	 8 8 4	**20**	70	1
Part III : Folk Art as Motif • Design and Layout • Overall impression	1		 10 5	**15**		1
Portfolio Submission • Complete work • Quality of work • Presentation	Self paced		 5 5 5	**15**		
Total	**7½**		**100**			**4**

ECONOMICS

(Cade No. 527)

CLASS XII

BRIEF

Economics is one of the social sciences, which has great influence on every human being. As economic life and the economy go through changes, the need to ground education in children's own experience becomes essential. While doing so, it is imperative to provide them opportunities to acquire analytical skills to observe and understand the economic realities.

At senior secondary stage, the learners are in a position to understand abstract ideas, exercise the power of thinking and to develop their own perception. It is at this stage, the learners are exposed to the rigour of the discipline of economics in a systematic way. The economics courses are introduced in such a way that in the initial stage, the learners are introduced to the economic realities that the nation is facing today along with some basic statistical tools to understand these broader economic realities. In the later stage, the learners are introduced to economics as a theory of abstraction.

The economics courses also contain many projects and activities. These will provide opportunities for the learners to explore various economic issues both from their day-to-day life and also from issues, which are broader and invisible in nature. The academic skills that they learn in these courses would help to develop the projects and activities. The syllabus is also expected to provide opportunities to use information and communication technologies to facilitate their learning process.

OBJECTIVES

1. 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.
2. Realisation of learners' role in nation building and sensitivity to the economic issues that the nation is facing today.
3. 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.
4. Development of understanding that there can be more than one views on any economic issue and necessary skills to argue logically with reasoning.

Paper 1 **1 Hour** **Marks : l00**

Units		**Marks**
Part A : Introductory Microeconomics		
1.	Introduction	4
2.	Consumer Equilibrium and Demand	18
3.	Producer Behaviour and Supply	18
4.	Forms of Market and Price Determination	10
5.	Simple applications of Tools of demand and supply	-
Part B : Introductory Macroeconomics		
6.	National Income and Related Aggregates	15
7.	Money and Banking	88
8.	Determination of Income and Employment	12
9.	Government Budget and the Economy	78
10.	Balance of Payments	7

Part A : Introductory Microeconomics

Unit 1 : Introduction

What is an economy? Central problems of an economy : what, how and for whom to produce; concepts of production possibility frontier and opportunity cost.

Distinctions between (a) planned and market economies, (b) positive and normative perspectives in economics, and (c) microeconomics and macroeconomics .

(Non-evaluative topics: Some basic tools in the study of economics - equation of a line, slope of a line, slope of a curve.)

Unit 2 : Consumer Equilibrium and Demand

Consumer's equilibrium - meaning of utility, marginal utility, law of diminishing marginal utility, conditions of consumer's equilibrium using marginal utility analysis.

Indifference curve analysis of consumer's equilibrium-the consumer's budget (budget set and budget line), preferences of the consumer (indifference curve, indifference map) and conditions of consumer's equilibrium.

Demand, market demand, determinants of demand, demand schedule, demand curve, movement along and shifts in the demand curve; price elasticity of demand - factors affecting price elasticity of demand; measurenment of price elasticity of demand - (a) percentage-change method and (b) geometric method (linear demand curve); relationship between price elasticity of demand and total expenditure.

Unit 3 : Producer Behaviour and Supply

Production function: Total Product, Average Product and Marginal Product. Returns to a Factor. Cost and Revenue: Short run costs - total cost, total fixed cost, total variable cost; Average fixed cost, average variable cost and marginal cost-meaning and their relationship.

Revenue - total, average and marginal revenue.

Producer's equilibrium-meaning and its conditions-under (a) total revenue-total cost approach and (b) marginal revenue-marginal cost approach.

Supply, market supply, determinants of supply, supply schedule, supply curve, movements along and shifts in supply curve, price elasticity of supply; measurement of price elasticity of supply - (a) percentage change method and (b) geometric methods.

Unit 4 : Forms of Market and Price Determination

Perfect competition - meaning and features.

Market Equilibrium under perfect competition - Determination of equilibrium price, Effects of shifts in demand and supply.

Non - Competitive Markets - monopoly, monopolistic competition, oligopoly - their meanings and features.

Unit 5 : Simple applications of Tools of demand and supply

(not to be examined)

Part B : Introductory Microeconomics

Unit 6 : National Income and related aggregates

Macroeconomics: Its meaning.

Some basic concepts of macroeconomics: consumption goods, capital goods, final goods, intermediate goods; stocks and flows; gross investment and depreciation. Circular flow of income; Methods of calculating National Income - Value Added or Product method, Expenditure method, Income method.

Concepts and aggregates related to National Income:

Gross National Product (GNP), Net National Product (NNP), Gross and Net Domestic Product (GDP and NDP) - at market price, at factor cost; National Disposable Income (gross and net), Private Income, Personal Income and Personal Disposable Income; Real and Nominal GDP. GDP and Welfare

Unit 7 : Money and Banking

Money - its meaning and function. Supply of money - Currency held by the public and net demand deposits held by commercial banks. Money creation by the commercial banking system. Central banking and its functions (example of the Reserve Bank of India).

Unit 8 : Determination of Income and Employment

Aggregate demand and its components. Propensity to consume and propensity to save (average and marginal). Short-run fixed price in product market, equilibrium output; investment or output multiplier and the multiplier mechanism. Meaning of full employment and involuntary unemployment. Problems of excess demand and deficient demand; measures to correct them - change in government spending, availability of credit.

Unit 9 : Government Budget and the Economy

Government budget - meaning, objectives and components. Classification of receipts - revenue receipt and capital receipt; classification of expenditure - revenue expenditure and capital expenditure. Various measures of government deficit - revenue deficit, fiscal deficit, primary deficit:their meaning and implications. Fiscal policy and its role (non-evaluative topic).

Unit 10 : Balance of Payments

Balance of payments account - meaning and components; balance of payments deficit-meaning. Foreign exchange rate - meaning of fixed and flexible rates and managed floating. Determination of exchange rate in a free market.

Sr. Secondary Course (Syllabus)

English

RATIONALE

In a multi – lingual society like India where different languages and diverse cultures interplay with each other all the time, learning second and third languages is becoming indispensable. In India, English has been assigned the status of an associate official language. It is also an as for international communication. English gives access to a large wealth of scientific and technical literature. It is also the language of business communication all over the world. The study of English is profitable to learners in several ways.

The syllabus centers to the needs of National Institute of Open Schooling learners, the majority of whom are adults. They are able to use their mother – tongue proficiently although they may not possess adequate knowledge of English. In the syllabus, therefore, a special effort has been made to create a sound language base areas as separate components and also by strengthening them further through the textual content.

A special feature of this syllabus in the introduction of English for Specific Purpose designed to need the varied professional and academic needs of the learners.

Thus an attempt has been made, in this course, to meet the vocational needs of learners who are already employed or will join the world of work;

- Academic needs of learners who are already employed or will join the world of work.
- Academic needs of learners who plan to pursue a college / university education.

The course assumes that the learner.

- Can read and comprehend simple passages in English with ease;
- Is familiar with the basic elements of English grammar;
- Can communicate wimple ideas clearly in writing and speech.

SPECIAL OBJECTIVES

The specific objectives of teaching English at the Senior Secondary stage are to enable the learners develop their:

- Reading ability, i.e. learner
- Locates important facts,
- Grasps the meaning, facts and ideas,
- Gets at the central idea of piece,
- Follows the sequence of ideas and events
- Identifies relationship between characters, facts and ideas,
- Compares facts and ideas,
- Infers meaning,
- Evaluates ideas, events and action,
- Interest non – verbal forms of presentations, develops the habit of reading for information& pleasure.
- Uses dictionary & encyclopedia
- **Writing ability**

- Writes simple sentences with correct punctuation and spelling
- Presents and develop simple ideas coherently
- Organizes ideas in to paragraphs using appropriate sentence linkers,
- Narrates event processes.
- Listening ability i.e. the learner
- Understands English spoken at normal conversational speed,
- Understands questions
- Follows directions.
- Understands the main ideas of stories, radio – broadcasts, commentaries and
- Academic pieces
- **Speaking ability**

COURSE CONTENT

The course in divided into four modules **Module**

1. Reading and functional grammar.

This module emphasizes the development of different reading skills, enhancement of vocabulary and functional grammar.

Module 2 Functional writing and study skills.

This module is designed to equip the learner with the ability to write clearly and correctly.

Module 3 Listening and speaking skillsis module provides th learners with opportunities to develop their listening and speaking skills. This will be done through two audio tapes accompanies by worksheets.

Module 4 E**nglish for specific purpose**

This module would help the learner to develop skills that are needs for academic and vocational purpose.

(i) English for Science

(ii) English for Receptionists

(iii) English for Office use

Total Study time

An approximate break up of the total reading time of 240 hours for the sections is as follows:

(i)	Reading and functional grammar	–	100 hrs.
(ii)	Functional writing and study skills	–	70 hrs.
(iii)	Listening and speaking skills	-	30 hrs.
(iv)	English and specific purpose	-	40 hrs

Distribution of marks

The total marks for English is 100. There will be one paper of 3 hrs. duration. The allocation of marks is a follows:

1. Prescribed texts	20 marks
2. Functional Grammar	15 marks
3. Functional writing skills	25 marks
4. Comprehension (unfamiliar passages)	20 marks
5. Optional module	20 marks
Total	**100 marks**

Module 1. Reading comprehension (prescribed texts) and functional grammar.

Study time 100 hrs.

Marks 20+15

A variety of genres – short stories, expository pieces, biographies, poems, plays, newspaper and magazine excerpts have been included. Teaching of grammar has been integrated with the reading texts. The emphasis is on functional grammar.

The following ten prose texts and five poems have been selected for development of different reading skills.

Prose texts (Prescribed)

1) A warmer or a colder earth (popular science) Arthur – C. Clark
2) The tiger in the tunnel (narrative) – Ruskin Bond.
3) First two or four pages from Sunny Days (autobiographical) – By Sunil Gavaskar
4) Case of suspension (narrative)
5) Big brother (narrative) Shekhar Joshi
6) Father, dear father (news paper article form the Hindu)
7) Face to face (autobiographical) Ved Mehta
8) I must know the truth (narrative) Sigrun Srivastva
9) If I were you (play) Douglas James
10) India, her past and her future (speech) Jawahar Lal Nehru

Poems

1) Leisure – W H Davis
2) The road not taken – Robert Frost
3) Where the mind is without fear- Tagore
4) My grandmother's house – Kamla Das

5) The night of the scorpion – Nissi, Ezekiel

Non prescribed

In this section learners will be exposed to newspaper, articles, tables, diagrams, advertisements etc. which they have to read carefully and interpret. In the examination similar pieces will be used.

Grammar and usage

The following points of grammar and usage have been selected from the reading passages.

1) agreement/concord: number – gender etc.
2) Tenses: simple past (negatives/interrogatives) present perfect, past perfect continuous, past perfect, expressing future time (will and going to)
3) Passive voice (perfect tenses and modals)
4) Modals (must, should ought to, would)
5) Linking words (to like because although, instead of, if, as, since, who, which that, when however, inspite of)
6) Reported speech, statements, questions (yes/no)

Module 2
Functional writing and study skills

Study time 70 hrs. 25 marks

This module help the learner to write descriptive and narrative paragraph, letters, reports notices etc. and also practice skills of note making

1. Paragraph writing
    - Describing objects
    - Describing people
    - Narrating events, stories

2. Letter writing
    - Application for leave
    - Application for jobs
    - Asking for information form various agencies (e.g. Last date for getting prospects; price of items before placing doers etc.)
3. Note making
4. Ending (punctuation, spelling, appropriate vocabulary, structures)

Module – 3

Listening and speaking skills

In this module the learners will be exposed to a variety of listening activities recorded on audiotapes. These will be samples of good spoken English, which the learners can use as models. Work sheets will accompany the listening material.

This module will include the following:

1. Introducing yourself/friends in formal and informal situations.
2. Inviting people (over the phone and face to face) giving details of occasion, time place and date. Acceptance and refusal of invitation – formal and informal.
3. Seeking and supplying information (example opening an account in a bank, applying for loans etc.)
4. Talking and conveying messages (over the phone and face to face).
5. Giving directions / instruction.
6. Discussing contemporary issues related to environment, child labour, gender bias etc.
7. Listening to excepts form television and radio.
8. Listening to poems/plays (prescribed).
9. Listening to speeches / talks.
10. Listening to songs like "We shall overcome".

Module 4 - 6

English for specific purposes

Study Time 40 hrs.

20 marks

There modules are being offered. A learner has to opt for any one. The first is for academic purposes and the next two are for vocational purposes. The focus is not on the teaching of the subject matter like science and literature but on the way in which language is used in the deferent subjects.

Module 4

English for Science

Study Time 40 hrs.

This course will introduce learners to some interesting pieces of popular science.

1. Health and hygiene
2. Conservation of (nearly extinct) animals.
3. Plant life.
4. Bio gas / solar energy.

These pieces illustrate the use of English in scientific writing: giving information factually, logically and objectively.

Module 5

English for Receptionist

Study Time 40 hrs.

This module will introduce the learners to a variety of exercises, tasks and meaningful activities related to the receptionist's use of English. The printed course materials will be supported by tapes.

The following competencies be developed:

1. Receiving messages, making request etc.
2. Supplying information
3. Giving advice and making suggestions
4. Dealing with complaints
5. Making entries in an appointment book, register etc.

Module 6

English for Office Use

Study Time 40 hrs.

This course will help the learner to use English effectively and appropriately in the office environment. The competencies will be developed.

1. Using the telephone taking and passing messages.
2. Receiving messages
3. Marking noting on files and circular.
4. Writing office notes, memos, notices, agendas for meetings.
5. Telegrams and fax messages.
6. Writing business letters, application enquires, complaints.
7. Filling in forms, cheques, pay in slips etc.

ENVIRONMENTAL EDUCATION (533)

Aims:

The learner

- To develop an in-depth understanding of various environmental issues and concerns of national and global importance.
- To develop a balanced view of the relationship between environment and development.
- To understand basic concepts related to sustainable development vis-à-vis improvement of quality of life.
- To develop a deeper concern for the environment and a sense of commitment andresponsibility to take proactive action.
- To appreciate the variety in living organisms and recognize India as a mega- diversity nation.
- To appreciate the role of the individual, community, national and international agencies in resolving environmental problems.
- To practice ways of bringing about qualitative improvement in the environment by assuming leadership role.
- To identify self with one's environment with an attitude to personally contribute towards its improvement.
- To respect customs and traditions related to local conservation practices and accept indigenous eco-friendly technologies.
- To develop skills to undertake and participate in investigative studies on various environmental issues; and
- To motivate others and participate in social and community activities in dealing with environmental problems.

CLASS XII

There will be two papers in the subject:

Paper I: *Theory – 3 hours …70 marks*

Paper II: *Practical/Project Work – … 30 marks*

PAPER I - THEORY

There will be one paper of three hours duration carrying 70 marks.

The paper will have two Sections:

Section A *(Compulsory) will contain short answer questions covering the entire syllabus.*

Section B *will consist of questions, which will require detailed answers. There will be a choice of questions in this section.*

1. Biodiversity

(i) Concept and value of biodiversity.

Understanding the concept of biodiversity. To appreciate various reasons for valuing and conserving biodiversity (ethical, moral, economic, aesthetic).

(ii) Types of biodiversity - species, eco and genetic.

Understanding each of the above with a few examples of each type.

(iii) Balance in nature.

Understanding the criticality of maintaining balance in nature and the consequences of interfering with natural cycles; study of an example where the balance was disturbed due to human interference, e.g. trawling and its impact on marine ecosystems. The self sustaining quality of undisturbed ecosystems.

(iv) Biodiversity for sustenance of mankind.

The various roles played by biodiversity in sustaining mankind - as a source of food, medicine, pollution control.

(v) Resource limitations.

What are the various factors that are responsible for limiting the resource availability /consumption.

(vi) Ecological role of biodiversity.

Understanding that each and every species plays a unique role in the functioning of an ecosystem, the concept of ecological niche (producers, consumers in the food chain and food web).

(vii) Interdependence between different species.

A basic understanding of different kinds of relationships – predation, competition, symbiosis, mutualism, commensalism, parasitism.

(viii) India as a mega diversity nation.

Appreciating that India with its varied climate and landscape is home to a variety of unique ecosystems and endemic species e.g. thelargest mangrove forest in the world - theSundarbans, vast mountain forests in the Himalayas, tropical evergreen forests in the western ghats and the north east region, desert vegetation in Rajasthan, thorn and scrub forests in the plateaus, etc.

(ix) Economic potential of biodiversity.

Evaluating the economic potential of biodiversity from several view points such as food, medicine, clean air, water, etc.

(x) Loss of biodiversity - threatened, endangered and extinct species.

Understanding the implications of loss of biodiversity.

Categorizing species in different groups like - threatened, endangered and extinct. Examples of plants and animals.

(xi) Strategies for conservation of biodiversity - insitu and exsitu.

Looking at various in-situ and ex-situ strategies for their efficacy and viability. In-situ - protected areas (biosphere reserves, national parks, wildlife sanctuaries).
Ex-situ - captive breeding, zoo, botanical garden, gene banks.

(xii) Mitigating people- wild life conflict.

Evolving strategies to mitigate people-wildlife conflict, especially for the communities staying close to forests or even within forests - fences or trenches around communities, building waterholes within forests, providing food for animals during times of drought to prevent them from straying outside the forest areas, maintaining a buffer zone between forest and human habitation, preventing human encroachment into forests. Preventing poaching by creating or increasing livelihood opportunities, involving local people in conservation by providing suitable incentives.

2. Environmental Management

(i) Need for environmental management vis-à-vis development.

Understanding that from the development point of view, environment may mistakenly be seen as a 'resource' to be exploited, whereas, environment needs to be viewed as a 'capital' that needs to be managed carefully.

(ii) Aspects of environmental management - ethical, economic, technological and social.

Understanding different aspects of environmental management as mentioned above.

Ethical - e.g. ensuring inter and intra generational equity, gender equity, etc.

Economic - e.g. Extended Producer Responsibility [EPR] taken up by companies in several countries - the producer of a product takes responsibility for the productafter its life is over e.g. battery companies taking back batteries after its life.

Technological - developing technologies that do not harm the environment - alternate technology products like solar cooker, solar car, biogas, etc.

Social - processes and policies that ensure social equity - use of commons and forests, urban land use, equitable representation and participation in local governing bodies.

(iii) Legal provisions for environmental management.

Understanding the role of legal provisions like – The Environment Impact Assessment [EIA] Notification; The Hazardous Waste (Management and Handling) Rules (1989), The Hazardous Bio-medical Waste (Management and Handling) Rules (1998), the Recycled Plastic Manufacture and Usage Rules (1999), The Ozone Depleting Substances (Regulations) Rules 2000. Ecomark scheme, Bharat standard for vehicular emissions.

Students are expected to be aware of existence of these Rules and the role they play in environmental management. They are not required to go into details of the Rules.

(iv) Approaches for environmental management - economic policies, environmental indicators, setting of standards, information exchange and surveillance.

Emphasis on ENVIS, ISO14000 and Environmental Indicators. Economic policies implemented by the government of India such as, penalties and subsidies.

3. Sustainable Development

(i) Concept of sustainable development.

Understanding the concept of sustainable development.

(ii) Concept of sustainable consumption.

Understanding the concept of sustainable consumption.

(iii) Need for sustainable development for improving quality of life for the present and future.

Developing an understanding of the need for sustainable development - looking at the deteriorating quality of air, water, food over time, developing an appreciation to sustain at least what exists for the generations to come.

(iv) Challenges for sustainable development - social, political and economic considerations.

Listing and understanding the challenges in each of the areas mentioned above, e.g. social - having to overcome resistance among people in the society to bring about changes in lifestyle (that will be needed for sustainable development to happen); political - to convince the Government to take hard unpopular decisions; economic - need for a change in economic viewpoint in order to implement sustainable development.

(v) Support base for sustainable development - political and administrative will, dynamic and flexible policies, appropriate technologies, comprehensive review and revision mechanism, humane approach.

Understanding the need for a support base. Study a few noteworthy examples of sustainable development e.g.- BarefootCollege in Tilonia, the work of NGOs like DDS in Andhra Pradesh in promoting self-sustenance in rural communities through developing seed banks, cultivation of millets and through promoting microfinance in theGrameen bank model.

(vi) Developing skilled manpower.

Understanding that there is a need for skilled manpower in the fields of agriculture and industry in order to carry out sustainable development.

(vii) Role of individual and community.

Self explanatory. An example from the local community to be studied along with an inspiring story from across the country. ***(only for the purpose of discussion and not for testing).***

(viii) Role of national and international agencies. (both governmental and non-governmental).

Understanding the role of agencies in creating awareness, framing policies, implementing laws and mobilising people.

4. Sustainable Agriculture

(i) Need for sustainable agriculture.

Understanding that modern agriculture is causing increasing amounts of land to be desertified, through the need to produce ever increasing quantities of food to feed the growing population.

To understand that on the one hand the demand for food is increasing due to population growth and on the other hand the land available is decreasing due to the impact of modern chemical farming.

(ii) Green revolution - impact on environment.

Introduction to Green revolution - Development of High Yielding Varieties (HYV); introduction of fertilizers and pesticides; consequences of using fertilizers; consequences of using pesticides on population of living organisms;contamination of soil, water, food, impact on human health; long term effects - increased incidence of cancer, malfunctioning of endocrine system, etc. Study of the impact of DDT.

(iii) Importance of soil for crops.

Role of soil biota in maintaining health ofsoil.

(iv) Irrigation systems, use of manure and fertilizers.

The role of irrigation in traditional agriculture. Traditional irrigation systems (micro, indigenous systems) vs. modern systems like large dams with their vast canal systems. Advantages of such macro systems, (like larger areas of cultivation) and disadvantages (like water logging).

(v) Crop protection - measures for control of pests– agrochemicals.

Study of a few traditional methods of pest deterrence vis a vis modern methods of pest control - viability of traditional methods in today's scenario and limitations and dangers of modern methods.

Role of agrochemicals in increasing food production.

(vi) Impact of agrochemicals on environment.

Study of a few commonly used agrochemicals and their impact on soil, water and air.

(vii) Elements of sustainable agriculture -mixed farming, mixed cropping, crop rotation, biological and economic consideration, use of

bio-fertilizers and bio-pesticides, biological pest control, integrated pest management.

Self-explanatory.

(viii) Application of biotechnology in crop improvement.

The scope biotechnology offers in developing favourable traits in crops, like pest resistance, drought resistance, salinity resistance.

(ix) Management of agricultural produce - storage, preservation, transportation and processing.

Understanding the dynamic of movement of agricultural goods from producers to consumers - understanding that tremendous amount of grain is lost to rats and spoilage due to poor storage facilities; food processing increasingly seen as a favourable option as it has a larger shelf life and brings about more revenue.

PAPER II – PRACTICAL/PROJECT WORK

Classes XI and XII

The practical/project work carrying 30 marks needs to be undertaken under the guidance of the teacher. The project will be evaluated by a Visiting Examiner (who has specific expertise in the content of the projectwork) appointed locally and approved by the Council.(For Class XI, Project Work may be evaluated by the teacher).

Exemplar Projects and Activities

It is expected that the students will undertake at least two projects or activities in each year, one of which should be undertaken individually and prepare a report in each case. Projects and activities may be planned and designed depending upon the local situations, available resources and environmental issues of concern. The projects and activities given below are only suggestive and not prescriptive.

1. To study the changes that have taken place in a given land area of a city/village/locality/market during the last five years in respect of at least five parameters like number of houses, residents and families, food habits, number of household goods in a family, consumption of water, electricity and fuels including that for personal vehicles by a family, sources of noise (public address systems being used, television, radio and vehicles on the road), common facilities like number of schools, hospitals, shops, theatres, public convenience, public utilities, public transport; number of' factories, industries and/or the facilities for, production and processing of goods, loss of water bodies, types and quantity of wastes, their disposal and treatment facilities with a view to discussing the patterns of changes and impact on the environment and quality of life. A specific project on these aspects may be:

- To study the changes that have taken place in a given land area during last five years in respect of number of houses, residents and families and prepare a report on their effects on civic amenities like availability of water, electricity and fuels; drainage-system, disposal of wastes including night soil.

2. To study the environmental profile of a town/locality/village in respect of population density, green cover, educational level ofresidents, social problems and sources of pollutionand their effect on air, water and soil.

3. Improvise two models of greenhouses of same dimensions made from low cost / no cost materials. Place them in open under identical conditions and put some potted plants in one of them. Note the temperature inside and outside both the greenhouses every two hours from dawn to dusk for two weeks. Explain the reasons for the differences in temperature, if any, between thetwo green houses.

4. Collect data on monthly consumption of electricity and fuels from at least five families, any two commercial establishments and for publicutilities in a given locality. Plan strategies to educate consumers to economize the consumption of electricity and fuel by reducing their over use, misuse and improper use.

5. To study for a period of one month the status of sanitary conditions and methods of waste disposal of a given locality vis-à-vis the role of Panchayat, Municipality or Corporation and prepare an action plan to make the conditions more environment friendly.

6. To investigate impact of an industry or a large manufacturing unit on local environment. The parameters could be land use, ratio of coveredarea and open space, raw materials used for production, inputs like electricity, water or any

other, types of waste generated and modes of waste disposal, use of environment friendly and efficient technology, types of pollutants emitted or discharged, average health status of the employees and residents in the area.

7. To study the impact of changes in agricultural practices or animal husbandry including poultry, piggery, fishery, apiculture over a period of time in a given locality or village on local environment. The components for analysis may include: types of crops, land area under cultivation, mechanization, use of electricity, mode of irrigation and agrochemicals, agro-wastes and their disposal, types of breeds and animal feed, types of shelter and health care, methods of preservation and processing of products, animal wastes and their disposal. Suggest an action plan to modify the prevailing practices so as to make them environment friendly and sustainable.

8. Collect samples of water from different sources and study their physical characteristics like turbidity, colour, odour; measure of pH, nature of suspended and dissolved impurities and pollutants, presence of toxic materials by testing presence of mercury, lead, arsenic, fluorine and presence of living organisms. Test the presence of toxic materials and living organisms with the help of local laboratory or institution may be taken, if available. Identify the most polluted sample ofwater and locate the sources of its pollution. Devise an action plan to mobilize public opinion for checking the pollution.

9. To study the practices followed in the region for storage, preservation, transportation and processing of perishable or nonperishable farm products and to assess the extent of wastage due to faulty practices.

10. To study the status of an endangered species listed for the region by collecting information through different sources and observation, if possible and to assess the reasons for its diminishing number. Suggest ways and means to protect the species.

11. To prepare a status report on prevalence of child labour in a given area through simple surveys on children engaged as domestic help and as workers in farms, commercial establishments and manufacturing units. The survey may be in respect of age group, education, wages, working hours, working conditions, safety in work place, health, handling hazardous materials and the like. Units dealing with hazardous materials and processes may be identified and an action plan to mobilize public opinion against practice of child labour may be prepared.

12. Conduct a survey of plants and trees in the locality and collect information about their cultural, economic and medicinal values from local people and available literature. Prepare an action plan for the propagation of trees that are most valuable in terms of their cultural,economical and medicinal use.

13. Prepare a flow chart to show different steps involved in the supply of tap water from source (river, bore well) to houses in the locality. Collect information from the concerned authorities about the quantity of water processed and the amount of energy required at each stage. Compute the energy spent for supplying 1 kilolitre of water to the consumer. Plan and execute a campaign to educate the community members about the implications of wastage of water in terms of energy.

14. Make a list of raw materials used by the family for preparing different types of dishes. Identify the plants and animals and their parts from which each food material is obtained. Also make a list of plants on which the animals in the list depend for their food. Name the processes, if any, inwhich action of microorganisms is made use of. Identify those plants and animals, which are foundin the locality. Prepare a report supported with diagrams/photographs/pictures/graphs to focus on the importance of biodiversity in providing food to human population.

NOTE: No question paper for practical work will be set by the NENBSE.

GEOGRAPHY

1. RATIONALE

The discipline of Geography promotes systematic studies of interaction between man and environment. The studies are undertaken on both the micro and macro levels. These studies at global, regional and local levels are taken up within the spatial and temporal frame work.

The contents of Geography become highly fascinating even to the beginner. Man has a reason to feel excited over the fact that his is a living planet pulsating with life and constantchange of every possible description. As far as his knowledge goes this is the only celestial body of its kind inhabited with intelligent life which he can think of.

Interplay between man an environment being the focal point of geographic study, its contents have become very exciting because of man's ingenuity and ability to adapt himself to the environmental variations spread over time and space. Since man and environment are equally dynamic, their interrelationship has been growing and becoming more and more complex day by day. A student of Geography is bound to be thrilled by the new insight into the exciting partnership between two.

Since Geography deals with both man and environment, it acts as a natural bridge between humanities and sciences. The former includes the contents from economics, history, political science, sociology, anthropology and commerce. The latter include earth sciences such as geophysics, geology, geomorphology, oceanography, climatology and meteorology. Astronomy and space sciences also provide a meaningful back drop.

It is against this broad perspective that the course in Geography has been drawn up for the Senior Secondary Stage. It is hoped that it would be dealt with accordingly.

Previously, the courses of study was divided in to two categories i.e. foundation and certification units. In the revised syllabus, all the lessons are compulsory and questions will be asked from each lessons according to the weightages of marks assigned to each module.

To the extent possible, the practicals should be dovetailed to the theoretical portions. The theoretical knowledge can be better assimilated and reinforced through its practical application. Practical problems can be quickly grasped only through the mastery over theory and basic principles. Thus theory and practicals must be seen in their complementary and reinforcing role instead of dealing with them in compartments in a routine or mechanical fashion.

2. OBJECTIVES

The main objectives of this course are as follows:

- To provide spatial (i.e. areal and locational) and temporal (i.e. time) dimensions to the patterns of interactions between man and environment for their proper appreciation.
- To help in appreciating different and changing social perceptions of environments as seen by different groups of people from place to place and by the same people from time to time.
- To help in understanding that man everywhere tries to make the best possible use of natural resources commensurate with his social and technological level of development.
- To help in realizing that man must use his environment and natural resource base on a continuing basis avoiding their destruction and westage.
- To help in understanding that the study of Geography of India should lead to emotional integration of her diverse people and removal of regional imbalances in its economic growth and developments.
- To help in appreciating the spirit and structure of Geography as discipline.

3. DISTRIBUTION OF MARKS

Module	Marks
1. The Earth – A Living Planet	03
2. The Domain of Air on the Planet Earth	08
3. The Domain of Water on the Planet Earth	04
4. Changing Face of the Planet Earth	12
5. Life on the Earth	08
6. Physical Setting in India	08
7. Natural Resources and their Development in India	07
8. Man-made Resources and their development in India	12
9. Human Resource and their Development in India	08
10. Optional Module	
A. Teaching of Geography at Primary Level	
OR	
B. Geography of Tourism in India	10
OR	
C. Field Work in Geography	
11. Map and its Elements	05

12. Map Interpretation	05
13. Statistical Diagram	05
14. Practical Record Book & Viva Voce	05
Total	100

4. COURSE DESCRIPTION

4.1 THE EARTH-A LIVING PLANET

Approach: The module is designed to give an idea of the vastness of the Universe and almost insignificant position of the earth in space. The uniqueness of the Earth sustaining intelligent life as we know it today in an endless expanse of the Universe needs to be brought out.

1. The Sun in the Universe:
    (1) The Sun – our star;
    (2) The Sun in Milkyway – our Galaxy
    (3) Galaxy and the Universe
2. The Sun's Family and Planet Earth –
    (1) Planets, Satellites, Asteroids, Comets;
    (2) Uniqueness of the Planet Earth
    (3) Moon-Earth's satellite.
    (4) Artificial satellites of the earth and the services they render.

4.2 THE DOMAINS OF AIR AND WATER ON THE PLANET EARTH

Approach: The module is designed to highlight important atmospheric phenomena and their direct bearing on man. The emphasis is on understanding the weather phenomena and its impact on day to day life.

4.2.1 Insolution and Temperature
1. Composition and structure of atmosphere
2. Insolation and heat budget
3. Global warming – its causes and effects.
4. Horizontal distribution of temperature; Factors affecting – (January and July temperature distribution.)
5. Vertical distribution of temperature and inversion of temperature.

4.2.2 Pressure and Winds
1. Atmospheric pressure and its measurement
2. Horizontal distribution of pressure (January and July pressure distribution)
3. Vertical distribution of pressure
4. Winds and their types: planetary, periodic and local winds.
5. Cyclones and anti cyclones

4.2.3 Humidity and Precipitation

1. Humidity and its measurement – absolute and relative humidity.
2. Evaporation and condensation, forms of condensation
3. Precipitation – forms and types
4. Distribution of precipitation in the world.

4.2.4 Weather and Climate

1. Weather and climate
2. Elements of weather and climate
3. Factors affecting climate

4.3 THE DOMAIN OF WATER ON THE PLANET EARTH

Approach: The module is also designed to acquaint the learner with the various submarine relief features, deposits and oceanic circulations along with their significance for man.

4.3.1 Oceans, Submarine Relief and Circulation of Ocean Waters

1. Ocean basins and continents; submarine relief.
2. Temperature – process of heating and cooling vertical and horizontal distribution of temperature.
3. Salinity and its distribution
4. Motion of ocean waters.
    (a) Waves;
    (b) Tides-causes, types and effects.
    (c) Currents-types; cause and effects. (warm and cold currents – Gulf stream and labradore current).
5. Importance of ocean for man.
    (a) moderators of temperature;
    (b) bridge between landmasses;
    (c) marine resource – fisheries, mineral, desalination of water for human use and
    (d) oceans as source of energy.

4.4 CHANGING FACE OF THE PLANET EARTH

Approach: The module is designed to understand the natural forces both internal and external responsible for the evolution of land fores around us. Significance of key land forms and processes of there development needs to be highlighted.

4.4.1 Earth's Interior and Materials of its Crust

1. Conditions inside the earth;
2. Materials of the earth's crust;
3. Rocks and minerals;
4. Types of rocks and their economic significance.

4.4.2 Major Landforms and their Economic Significance

1. Major landforms – mountains, plateaus and plains and their economic significance.

4.4.3 Evolution of landforms due to Internal Forces

1. Earth movements
2. Sudden and slow movements.
3. Vertical and horizontal movements.
4. Folding and faulting.
5. Volcanoes – causes and distribution.
6. Earthquakes-causes and distribution.

4.4.4 Evolution of Landforms due to External Forces.

1. Process of gradation.
2. Weathering – its types;
3. Formation of soils;
4. Agents of gradation – Work of running water, Underground water, moving ice, wind and sea waves.

4.5 LIFE ON THE EARTH

Approach: The module is designed to highlight the varied responses of man in different bio-physical conditions. Biosphere is the biotic realm of the earth, where man is the most effective component both as a constructive as well as destructive agent.

4.5.1 Significance of Biosphere

1. Three basic realms of the earth.
2. Biosphere – its limits and the main elements.
3. Ecology, ecosystem and energy flow.
4. Role of human being in the ecosystem and their varying responses.

4.5.2 Life in the Low Latitudes

1. Concept of natural region.
2. Environmental and human responses in the
   (a) Equatorial lowlands, (b) Monsoon lands and (c) Hot Deserts.

4.5.3 Life in the Mid-Latitudes

1. Environmental and human responses in the
   (a) Mediterranean lands and (b) Temperate grass lands.

4.5.4 Life in the High Latitude

1. Environmental and human responses in (a) Lands of Taiga and (b) Tundra.

GEOGRAPHY OF INDIA

4.6 PHYSICAL SETTING IN INDIA

Approach: The module is designed to give general acquaintance about physical environment of our country in terms of its physiographic, climatic characteristics and their combined impact on soil and natural vegetation.

4.6.1 Physiographic

1. Location, extent and size.
2. Structure and physiographic divisions-Northern Mountains, Northern plains, Peninsular plateau, Coastal plains and Islands.
3. Drainage Systems – the Himalayan and the Peninsular rivers.

4.6.2 Climate and Natural Vegetation

1. Climate – factors influencing the climate of India, cycle of seasons, concept of monsoon.
2. Natural vegetation – major natural vegetation regions and their characteristics.

4.7 NATURAL RESOURCE AND THEIR DEVELOPMENT IN INDIA

Approach: The module is designed to acquaint the learner with the variety of natural resource available in our country and their utilization for the economic development.

4.7.1 Natural Resources

1. Land resource – Land as a resource and its major uses.
2. Soil Resources – Major soil types; soil conservation.
3. Water Resources – Water budget, utilization and management of river waters for irrigation and hydroelectricity, (only example of major dams for explaining the idea of damming, diversion and canalization), ground water tapping, overuse and the need for conservation; The benefits of major river valley projects.
4. Forest Resource – Distribution of major forest types; forest produce, problems of deforestation, strategies of conservation and development with a few examples from specific areas.

5. Wild life Resources – Bio-reserves, national parks, wild life sanctuaries, impact of deforestation on wild life.
6. Mineral Resources: Distribution of mineral fuels, petroleum, natural gas and atomic minerals; Distribution of the minerals as industrial raw material – iron ore, bauxite, manganese, limestone, mica; Mineral rich zones; Production, consumption and trade of important minerals; Wastage and need for conservation.

4.8 MAN-MADE RESOURCES AND THEIR DEVELOPMENT IN INDIA

Approach: The module is designed to acquaint learner with the variety of man-made resources in India and their development.

4.8.1 Agricultural Development

1. Land use patterns and its significance for agriculture.
2. Scope for expansion/reclamation of cultivable land for raising agricultural productivity. Changing agricultural scenario as a result of induction of new technology and its significance in horticulture, sericulture, pisciculture and livestock rearing.
3. Kharif and Rabi crops & Zaid (short season crops); Areas and production of food crops-rice, wheat, millets; Areas and production of industrial crops – sugarcane, cotton, jute, coffee, oilseeds.
4. Prevailing agriculture practices – with examples from different regions.
5. Areas where horticulture, sericulture and livestock development has taken place.

4.8.2 Industrial Development

1. Existing patterns and newly emerging characteristics of agro-based and mineral based industries.
2. Locational factors in the distribution and development of (a) agro-based industries (i) Sugar, (ii) paper, (iii) cotton, jute, textiles and vegetable oil;
   (b) minerals-based industries (i) Iron and steel, (ii) transport equipment industries, (iii) cement; (iv) fertilizers, and (v) petrochemicals,
3. Industrial growth and its impact on environment and the required remedial measures.

3.8.3 Infrastructural resources.

1. Role of Infrastructure for development.
2. Production and distribution of energy in India-Thermal, hydel, nuclear and non-conventional sources of energy; National power grid, Inter-state problems.
3. Railways, influence of terrain; complimentarity with railways.
4. Roadways – influence of terrain; complimentarity with roadways.
5. Water ways and airways – benefits and development.
6. International Trade – Changing scenario, ports and airports.

3.9 HUMAN RESOURCE AND THEIR DEVLOPMENT IN INDIA

Approach: The module is designed to acquaint the learner with the importance of population as a resource. Relationship between economic prosperty and quality of life is highlighted.

4.9.1 Distribution of Population.

1. Density and distribution of population
2. Factors influencing density and distribution of population.

4.9.2 Growth of Population

1. Components of population Growth – Birth rate, Death rate, and Migration.
2. Regional trend in population growth.

4.9.3 Population Composition

1. Characteristics of the composition of population in India.
    (a) Rural – urban composition,
    (b) Sex-age composition,
    (c) Linguistic composition,
    (d) Religious composition,
    (e) Scheduled Castes, Schedule Tribes, composition and distribution.
    (f) Literacy

2. Conclusion

4.10 OPTIONAL MODULES

A. TEACHING OF GEOGRAPHY AT PRIMARY LEVEL

Approach: This module would reflect two fold approach containing pedagogical inputs on one hand and enrichment of basic knowledge needed to develop competencies to teach the subject with interest.

4.10.1 Nature and Scope of Geography Teaching.

1. Aims and objectives of teaching Geography as a part of Environmental studies or social studies.
2. Correlating geography with their school subjects.

4.10.2 Introducing Elementary Concepts in Geography.

1. Methods of teaching geographical concepts and skills (a) Promotion of observational skills, (b) playway and activity methods and (c) use and preparation of teaching aids.

4.10.3 Specimen content units with lesson plan.

1. Specimen content units : (a) different way of living in India, (b) Many ways of living in the world, (c) story of transport and communication and (d) Story of Trade – local, national and international.

B. GEOGRAPHY OF TOURISM IN INDIA

Approach: The module is designed to acquaint the learner with the concept and development of tourism and it relevance for India. It will also highlight various aspects related to it.

4.10.1 Concept of Tourism.

1. Meaning of Tourism, brief history of tourism (reference of famous early traveler)
2. Types of tourism.
3. Classification of resorts.

4.10.2 Development of Tourism in India.

1. Causes and factors of growth.
2. India's unique wealth for tourism.
3. Planning for organization of tour activities.

4.10.3 Impact of Tourism

1. Development of under developed areas.
2. Development of invisible exports.
3. Planning for organization of tour activities.

4.10.4 Problems of mass tourism

1. Profile of Indian tourism.
2. Undue pressure on local people and price rise.
3. Pollution of environment.
4. Alienation of local people from their culture.
5. Strategies for travel promotion.

C. FIELD WORK IN GEOGRAPHY

Approach: The module has been shaped to acquaint the learner with processes involved in socio-economic survey of an area to study its various aspects.

4.10.1 Field And Its Purpose

1. Role of Fieldwork in Geography.
2. Aim and Formulation of Hypothesis.
3. The Different Approaches to Fieldwork.

4.10.2 Design and Methodology of Field Work.

1. Design: Importance, Components and Types.
2. Selection of samples and sample size.
3. Formulation of Questionnaires and Schedules; Field Sketches etc.
4. Collection of Information:
    (a) Methods of administering the questionnaires and survey schedule;
    (b) Identification of samples;
    (c) Use of Field Sketches;
    (d) Precautions in collecting the information.

5. Processing and Presentation of Information:
    (a) Processing of primary data.
    (b) Presentation of data: tabular and cartographic

6. Preparation of Field Work

1. Land-use survey of a village
2. Survey of a Market/Weekly market
3. Survey of Civic Amenities in an area.
4. Survey of Landforms of an area.

PRACTICAL GEOGRAPHY

4.11 ELEMENTS OF MAP

Approach: The module is designed to acquaint the learner with the essential component of a map in order to develop man reading skills.

4.11.1 Directions and Scale

1. Definition of a map; types of maps
2. Directions- True North and Magnetic North.
3. Scale – Representation of scales on map.
    (i) Statement of scale,
    (ii) Representative Fraction (R.F.)
    (iii) Linear scale and its construction.
4. Latitude and longitudes.

Important latitudes;
Longitude and time, IST and date line and
Grid of latitudes and longitudes and location of places on maps.

4.11.2 Map Projections

1. Maps – grids of latitude and longitudes.
2. The globe and maps – their merits and demerits.
3. Developable and non-developable surfaces.
4. Classification of map projections.
5. Map projection –basis, identification and uses:
    (a) Cylindrical Equal – Area Projection
    (b) Mercator's Projection
    (c) Simple Conical Projection with one standard parallel.
    (d) Zenithal Equi-distant Project and
6. Choice of map projection for India.

4.12 MAP INTERPETATION

Approach: This module is designed to acquaint the learner with various types of maps, their characteristics and the interpretation.

4.12.1 Maps and their Interpretation

A. Interpretation of Topographical Map.

a. Marginal Information
b. Use of conventional signs and symbols;
c. Methods of representing relief on map contours level colouring spot heights, benchmarks.
d. Identification of relief features on a map through contours –conical hill, plateau, ridge, v-shaped valley, escarpment, cliff, waterfall, types of slopes (uniform, undulating, convex and concave, gentle and steep);
e. Drawing of a cross-section or a profile from a contour map;
f. Interpretation of topographical sheets.

4.12.2 Weather Instruments and Interpretation of Weather Maps

1. Weather instruments, uses and the data collected from them.
2. Significance of weather maps.
3. Weather Symbols.
4. Study of January and July Indian weather maps in respect of temperature, pressure, wind direction, velocity, cloud cover and precipitation.

4.13 STATISTICAL DIAGRAMS

A p p ro a ch : The module is designed to acquaint the learner with various methods of interpreting data for drawing meaning but inferences and converting them into visual and more comprehensible forms.

4.13.1 Representation of Statistics Data through Diagrams.

1. Line-graph
2. Pie-diagram
3. Bar-diagram
4. Star diagram
5. Distribution maps.

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Class XII

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SYL L AB U S

Total Reading Time : 240 Hours Max. Marks 100

Number of Papers One

RATIONALE

History is the scientific study of human beings and the evolution of human society in point of time and in different ages. As such it occupies all important place in the school curricu- lum. It is, therefore, taught as a general subject forming a part of Social Science both at the Middle and the Secondary Stages. At the Middle Stage, entire Indian History is covered, while at the Secondary Stage, the land marks in the development of human society are taught.

At the Senior Secondary Stage, History becomes an elective subject. Its main thrust is to bridge the gap between the presence of change-oriented technologies of today and the con-tinuity of our cultural tradition so as to ensure that the coming generation will represent the fine synthesis between change and continuity. It is, therefore, deemed essential to take up the entire Indian History from the Ancient to the Modem period for Senior Secondary Stage.

The rationale for taking up the teaching of History at this stage is :

1. to promote an understanding of the major stages in the evolution of Indian society through the ages.

2. to develop an understanding of the historical forces responsible for the evolution of Indian society in the Ancient, Medieval and Modem times.

3. to develop an appreciation of

   the diverse cultural and social systems of the people living indifferent parts of the country.

   the richness, variety and composite nature of Indian culture.

   the growth of various components of Indian culture, legitimate pride in the achieve-ment of Indian people in. different parts of the country.
   the process of change which evolved as a result of interaction with other cultures.

   4. to identify the fissiparous trends which hampered the growth of the Indian nation in different periods.

5. to recognize that the Indian culture has not remained and developed in isolation, rather was a result of a synthesis of different cultures and to understand thecontemporary process of change, continuity and development.

6. to remove from the minds of the younger generation prejudices and complexes

transmitted from the biased interpretation of History, the social environment and the accident of birth.

7. to develop an appreciation of the contribution made by the people from all parts of the country in the making of the national heritage.

8. to foster proper understanding of the contemporary problems of India in historical perspective so as to develop an enlightened citizenship for active participation in the establishment of a just social order.

9. to inculcate scientific temper and objectivity to the study of India's past in order to relate to the present.

The study of History at this stage is intended to initiate and introduce students to the 'Elements of Historical Methodology' as also how the historian thinks and works. For this,he should be acquainted with the various types of sources which form the basis of historyand develop the competence to evaluate the reliability of the sources.

APPROACH

Keeping in view the implications of the National Policy on Education (May, 1986, PP. 3,4) providing access to education of a comparable quality for all students, irrespective of caste, creed, location or sex and the Programmes of Action (August, 1986, P. 144) emphasizing the immediate need for introducing the curricular change in the content of history essentialto nurture national identity, protect, preserve and promote our common cultural heritage, the approach to the teaching-learning of History at the +2 Stage (Senior Secondary) will highlight the following:

1. The new focus will be on the socio-economic and cultural development of man in society. The political developments and dynastic treatment, which has been hitherto the main thrust in the teaching-learning process, will no longer be given undue emphasis.

2. The emphasis at this stage will be laid on the development of a composite culture and national integration by highlighting the contribution of the people from all parts ofthe country through the ages. The development of the components of composite culture has assumed different forms in different periods of Indian History. In Ancient and Medieval India, the cultural identity and unity formed the main basis whereas in Modern India, the political unification during the British rule constituted the main plank of the composite culture which was strengthened further with the integration of the Princely States with the India Union.

3. It is necessary to highlight the role, the suffering and sacrifice of the people in the struggle for freedom against the British rule irrespective of religion and region.

4. Other important areas include the removal of social evils and emancipation of women in modern India.

The study of History at this stage will not remain confined to the reading material alone. The whole process will be activity oriented with more emphasis on the self-learning activities of the learners. To create further interest in the study of History frequent use will be made of audio-visual aids (T.V.-CCTV), maps, charts, time-line, genealogical tables and the learner will be required to study historical geography of India and undertake field trips wherever feasible. The development of the entire process of learning History will take place with theclose co-operation and active participation of the learner during the contact programmes.

Each module of the course (Unit and Sub-Unit) has been divided into two parts-the *General Foundation* Units and the *Certification* Units. The General Foundation Units provide a comprehensive view of Indian History in chronological sequence for proper understanding of the main events of Indian History in self-contained units. The Certification Units are to be studied in reasonable depth including interpretation critical thinIdng and balanced views for eItemal examination at the Senior Secondary level.

SYLLABUS IN OUTLINE

Module		*Marks*
1.	Ancient Indian History	08
2.	Climax of Ancient India	10
3.	Legacy of Ancient India	12
4.	Rise and Fan of the Delhi Sultanate	08
5.	The Mughal Empire	10
6.	Contribution of Medieval India	12
7.	Renascent India	08
8.	India's Struggle for Independence	22
9.	Maps	10

The *General Foundation* units form the base for understanding the *Certification-units.* All units should therefore be studied. Howeverthe examination will be based only on the units marked *Certification.*

The erstwhile Module 9 *India Since Independence* has now been incorporated as Unit 65 *India Since Independence* in Module 8.

MODULE—1

EARLYANCIENTINDIAN HISTORY

Study Time : 25 hrs. Marks : 08

Approach

This module is designed to highlight the continuity and change inthe socio-religious life of the Harappan and Vedic cultures followed by the interaction of Brahamanism, Jainism, Buddhism, the impact of Persian and Greek culture and the growth of political unity underMagadh.

Pre -requisite Knowledge

- Knowledge of the historical geography of ancient India.
- A proper perspective of the Dravidian Civilisation.
- Knowledge of the beginning of the Age of Metals—use of copper and bronze which produced the earliest urban civilisation in India.

CONTENTUNITS

Unit 1 Prehistoric India

1.1 Pre-historic India

General Foundation

— Impact of geography on Indian History
— Unity in Diversity
— Ancient people of India
— Pre-historic Cultures
— Palaeolithic Culture
— Neolithic Culture
— Chalcolithic Culture

Unit 2 The Harappan Civilisation

General Foundation

2.1 Salient features of the Harappan Civilisation

— Sites, Extent and Period
— Town Planning
— Social Life
— Crafts and Trade
— Pottery
— Seals
— Terra-cotta figurines
— Religion
— Script
— Weights and Measures
— Disappearance

Certification 2.2 Its Significance

- Legacy of the Harappan Civilization
- Harappan Civilisation and West Asia
- Harappans Aryans and the Vedic

Unit 3 The Vedic Age

General Foundation 3.1 The Rig-Vedic Age

- The Aryan Advent
- Political Organisation
- Early Aryan Society
- Economic Life
- Rig Vedic Gods

General Foundation 3.2 The Later Vedic Age

- Expansion
- Political Changes
- Material Life
- Social Development
- The Epic Age
- Religion

Certification 3.3 Importance of Vedas

- Schools of Vedic Philosophy
- Vedic Literature : Samhitas, Brahmanas, Aranyakas
- The Upanishads and the Puranas
- Concept of Dharma: Four ends of Life
- Evolution of the Caste System- The Dharmashastras
- Varnashrama System (Four Stages of Life)

Unit 4 Ancient Indian Religions

General Foundation 4.1 Jainism

- Vardhaman Mahavira
- Doctrine of Jainism
- Spread of Jainism
- Rise of Sects

General Foundation 4.2 Buddhism

- Life of Gautama Buddha
- Doctrines of Buddhism
- Spread of Buddhism
- Rise of Sects
- Decline of Buddhism

Certification 4.3 Contribution of Jainism and Buddhism

- Importance of Jainism
- Influence of Buddhism
- Comparison of Jainism with Buddhism

Unit 5 Growth of Political Unity

General Foundation 5.1 Rise of Magadh

- Concept of Political Unity
- Sixteen Mahajanapadas
- Magadhan Supremacy
- The Nandas

General Foundation 5.2 Persian and Greek Invasions

- Persian Conquest
- Alexander's Invasion
- Extinction of Greek rule in Northwest India

Certification 5.3 Importance of Magadhan Supremacy and Foreign

- Importance of the first Magadhan Empire
- Results of the Persian Impact
- Effects of Alexander's Invasion

Suggested Activities for Extended Learning

Prepare a time line showing:

(1) the period of Harappan Civilisation
(2) the Rig-Vedic Age
(3) the Epic Period
(4) the Jaina-Buddhist period.
(5) the rise of first Magadhan Empire
(6) the invasion of Alexander

- Draw a list of important Vedic, Jaina and Buddhist literature relating to this period.
- List important archaeological materials of the Harappan civilisation.
- On a given outline map of India show the following:
  (1) Harappa, Mohenjodaro, Lothal and Kalibangan
  (2) Areas of Mahajanapadas of
  (a) Avanti (b) Gandhara (c) Kosala (d) Magadh (e) Vatsa (f) Matsya
  (3) Route of Alexander's invasion
  (4) Extent of Magadhan Empire under Mahapadma Nanda.

– A visit to a nearby museum, if there is one, to see the archaeological remains of ancient Indian bricks, pottery, seals, implements, ornaments, toys and idols. Collect available picture postcards relating to the art,sculpture and architecture of ancient Indian Published by the Archaeological Survey of India, New Delhi

– Read about the social and political conditions asreflected in the 'Epics' (Ramayan and Mahabharata).

MODULE – 2
CLIMAX OFANCIENT INDIA

Study Time: 25 hrs. **Max. Marks: 10**

Approach This module is designed to highlight the cultural aspects of life in the Maurya,Gupta and Vardhana empires and also the development of culture in Eastern and Southern India.

Pre-requisite Knowledge

* Rise of Mahajanapadas and transition from Republic to the centralised monarchy.
* Spread of Indian religions: Hinduism, Jainism and Buddhism.
* Cultural impact of the Persian and the Greek Invasions.

CONTENT UNITS

Unit 1 The Age of Mauryas

General Foundation

- Chandra Gupta Maurya
– Imperial organisation
– Ashoka; Impact of the Kalinga War
– Dharma and spread of Buddhism
– Edicts
– Cause of Downfall of the Mauryan Empire

Unit 2 Kanishka and Satavahanas

General Foundation

2.1 The Indo-Greeks
– The Sakas
– The Parthians
– The Kushans – Kanishka-Achievements of Kanishka

2.2 The Satavahanas
– Political Developments

- Foreign Trade and Settlements
- Pattern of Social Life
- Religious Life

Unit 3 The Gupta Empire and Harsha

General Foundation 3.1 The Gupta Empire

- Rise and expansion of the Gupta Empire - Chandragupta I
- Samudragupta
- Chandragupta II
- Decline of the Gupta Empire-Invasions of the HunasLife

Certification 3.2 in the Gupta Age

- Administration
- Social development-Status of women
- Economic life
- Religious life
- Account of Fa-hsien

Certification 3.3 Harsha

- Main events
- The Assembly at Kanauj, - Account of Hsuan Tsang
- Nalanda University

Unit 4 Development in Eastern and Southern India *Certification* *General Foundation*

4.1 Development of Culture in - Assam

- Bengal
- Kalinga

4.2 Early Kingdoms of the South

- Early Cholas, The Cheras and Pandyas - The Chalukyas
- The Rashtrakutas
- The Pallavas
- The Cholas

Unit 5 Life under the Maurya and The Gupta Empire

Certification

- Asoka's place in History
- Contacts with Central Asian Countries - Growth of Brahmanism and Buddhism
- Development of Art, Architecture, Painting, Literature under the Guptas

— Science and Technology under the Guptas

Suggested Activities for Extended Learning

— Visiting nearby museum to prepare list of archaeological remains and pieces of the Mauryan, Kushan and Gupta Age

— Identifying sea-ports of India on a map of India.

— Studying the contributions of Aryabhatta to the development of Science.

MOD UL E - I

LEGACYOFANCIENT INDIA

Study Time : 25 Max. Marks : 12

Approach

This module is designed to highlight the development of Indian painting, sculpture and different styles of architecture, schools of philosophy and development of science in ancient India. It also reflects a wonderful resource in men and money possessed by the rulers and the changes in spiritual ideals and ideas. Art in ancientIndia was a true reflex of national mind. Modern India is indebted to the important cultural contributions of ancient India.

Pre -requisite Knowledge

- A proper understanding of different phases of evolution of Indian
- religions.
- Indian colonial and cultural expansion in Asia,
- Appreciation of the cultural contributions of the Maurya, Kushan, Gupta and Vardhana Empires.

CONTENT-UNITS

General Foundation **Unit 1 Indian Culture Abroad**

— Spread of Indian Culture in West Asia, Tibet, China and South EastAsia

— Colonial Settlement Abroad

— Development of Trade and Commerce

— Art and Architecture—Angkor Vat and Borobudur

Certification

Unit 2 Our Cultural Heritage Contributions of Ancient India :

— Aryan—non-Aryan Synthesis

— Agrarian Economy

— Rise of Landed class

- Changes in the Vama System
- Hindu-Jain-Buddhist Interaction
- The Coming of Christianity
- Mathematics and Medicine
- Literature and Philosophy: The Tamil Hertiage
- Sculpture, Painting and Architecture: Brief Outlines of Schools of Art; Gandhara and Mathura: Contributions of the Pallavas and the Cholas; Mahabalipuram, Tanj ore and Halebid

Suggested Activities - Visiting important historical places e.g. Bodhgaya, Sarnath, Sanchi, Mount Abu, Mahabalipuram, Kanchipuram, Tanj ore and Halebid, Ajanta and Ellora.

- Collecting picture postcards of important sculptures of the period.
- Locating important cultural sites on a map of India.

MODULE - IV
RISE AND FALL OF THE DELHI SULTANATE

Study Time: 20 hrs. **Marks: 08**

Approach This module is designed to highlight the foundation, expansion and disintegration of the Delhi Sultanate, Vijaynagar and Bahmani Kingdoms and also the invasion of the Mongols and the advent of the Portuguese in India. *Pre-requisite* * The state of affairs under different dynasties of Rajputs, their internal

Knowledge conflicts.

* Temptation of invaders for Indian wealth.

CONTENT UNITS

General Foundation **Unit 1 Establishment of the Delhi Sultanate**

1.1 Advent of Islam in India

- Coming of Arab traders
- Conquest of Sind (712 A.D.)

General Foundation 1.2 Indian invasion of Sultan Mahmud of Ghazni (996-1030 A.D.)

- The emergence of Rajput states and the struggle for supremacy.

– Advent of Muhammed Ghuri (1173-1205 A.D.) and the Battles of Tarain
– The Mamluk Sultans, Iltutmish, Raziya and Balban
– The Mongol invasions
– Conquest of Northern India by the Mamluk Sultans

Certification 1.3 A comparative estimate of the achievements of Sultan Mahmud of Ghazni and Muhammad Ghuri.

– Effects of Sultan Mahmud of Ghazni's invasion of India.
– Causes of success of Turkish conquest of Northern India and the failure of Rajput resistance.
– Achievements of Iltutmish and Balban.

Unit 2 Alauddin Khalji and Muhammad Bin Tughlaq

General Foundation 2.1 The Khaljis (1210-1320)

– Jalaluddin Firuz Khalji (1210-96)
– Alauddin Khalji (1296-1316)
– Expansion of Delhi Sultanate: Devgiri, Rajputana and Malwa
– Deccan Expedition of Malik Kafur (1307)
– Mongol Invasions

General Foundation 2.2 The Tughlaqs (1320-1412 A.D.)

– Ghiyas-ud-din Tughlaq (1320-24 A.D.)
– Territorial expansion and suppression of revolts
– Fall of Warangal
– Accession of Muhammad Tughlaq
– Expansion in the South: Kampili and Hoysala

Certification 2.3 Reforms of Alauddin Khalji

– Military Organisation
– Agrarian Reforms
– Market Regulations
– Assessment of Reforms

Certification 2.4 Experiments of Muhammad-Bin-Tughlaq (1325-1351 A.D.)

– Transfer of Capital
– Taxation in the Doab
– Introduction of Token Currency
– Invasion of Khurasan
– Ibn Batuta
– Appraisal of the Experiments

— Rise of Provincial Dynasties : Jaunpur, Gujarat, Malwa, Bengal, Kashmir

— The Saiyids and the Lodi Sultans

Certification

3.2 Impact of Reforms of Firuz Tughlaq — Effects of Timur's invasion of India

— Estimate of Zainul Abidin of Kashmir

— Achievements of Sikander Lodi

Unit 4 Rise and fall of the Vijaynagar and Bahmani Kingdoms

General Foundation

4.1 Foundation of the Vijaynagar Kingdom

— Rise and expansion of the Bahamani Kingdom and conflict with Vij aynagar

— Advent of the Portuguese

— Bread-up of the Bahmani Kingdom

— Battle of Talikota and Distintegration of the Vijaynagar Kingdom.

Certification

4.2. Climax of Vijaynagar : Deva Raya II, Krishna Deva Raya III

— Evaluation of the Achievements of Mahmud Gawan

— Causes of the break-up of the Bahmani Kingdom

— Causes of the downfall of the Vijaynagar Kingdom

Suggested Activities for

Extended Learning

— Visit to a nearby museum of any place historical importance related to the Delhi Sultanate

— Collection of the extract from account of foreign travellers visiting Vijaynagar Kingdom.

— Study the extent of the territories under the provincial dynasties of Jaunpur, Gujarat, Malwa, Mewar and Kashmir.

— Study the strength and weaknesses of Pataliputra, Kanauj, Daulatabad and Calcutta (until 1911) as capitals of India.

MODULE V

THE MUGHAL EMPIRE

Study Time : 30 hrs. Max. Marks : 10

Approach

This module is designed to highlight the efforts of the Mughals towards political integration of India and development of a composite culture. It also identifies the forces which contributed to the disintegration of the Mughal Empire and the emergence of independentprovincial states.

Pre-requisite Knowledge

* Recognizing the factors which led to the rapid changes of dynasties during (the Delhi Sultanate)
* Understanding the political condition of India in the fifteenth century.
* Knowledge of the results of Timur 's invasion of India.
* Knowledge of the weaknesses of the Lodi dynasty which helped Babur to establish Mughal rule in India.

CONTENT-UNITS

Unit 1 Establishment of the Mughal Empire

General Foundation

1.1 Establishment of the Mughal Empire
- India at the opening of the sixteenth century
- Babur and the foundation of the Mughal Empire.
- Humayun's struggle with Bahadur Shah and Sher Shah
- End of Sur Dynasty and return of Humayun

Certification

1.2 Significance of Babur 's advent into India
- Administration of Sher Shah

Unit 2 Consolidation of the Mughal Empire

General Foundation

2.1 Accession of Akbar and expansion of the Mughal Empire
- Jahangir and Shah Jahan
- Foreign Policy of the Mughals: North Western Frontier and Central Asia.

Certitication

2.2 Achievements of Akbar: Efforts towards Integration
- Assessment of the achievements of Jahangir and Shah Jahan

Unit 3 Decline of the Mughal Empire

General Foundation

3.1 Aurangzeb and War of Succession
- Relations with Assam and Bengal
- Popular Revolts : Jats, Satnamis, Bundelkhand

Certification

3.2 Role of Aurangzeb
- Causes of Aurangzeb's success in the War of Succession
- Significance of Popular Revolts

Unit 4 Mughal Relations with Rajputs and Sikhs

General Foundation

4.1 Babur and the Rajputs
- Akbar's Rajput policy: Conquest of Chittor, Ranthambhor
- Rana Pratap and war with Akbar

– Aurangzeb's relations with the Sikh Gurus: Guru Amar Das and Guru Ram Das

– Jahangir and Sikh Gurus: Guru Arjun Das and Guru Hargovind

– Aurangzeb and Sikh Gurus: Tegh Bahadur and Gobind Singh

Certification 4.2 Evaluation of Rajput policy of the Mughals

– Assessment of the Mughal Policy towards the Sikhs.

Unit 5 Mughal Empire and the Deccan

General Foundation 5.1 Mughal Policy towards the Deccan under Akbar

– Conquest of Berar, Ahmadnagar and Khandesh

– Shah Jahan and the Deccan

– Viceroyalty of Aurangzeb

– Annexation of Bijapur and Golconda by Aurangzeb

Certification 5.2 Assessment of the Mughal policy towards the Deccan

– Akbar

– Aurangzeb

Unit 6 Rise of the Marathas

General Foundation 6.1 Rise of Shivaji

– Aurangzeb's relations with Shivaji

– Aurangzeb's war with the Marathas after Shivaji (1680-1707)-Shambhaji, Raja Ram and Tara Bai *Certification* 6.2 Shivaji's Administration

– Estimate of Shivaji

– Assessment of Aurangzeb

– Aurangzeb 's responsibility for the decline of the Mughal Empire.

Suggested Activities for Extended Learning

- Collect picture post cards of important Mughal Monuments from Tourist Departments of Delhi and U.P.
- Visit to a nearby historical place relating to the Mughal Forts, Palaces and gardens.
- Prepare a flow chart of

(1) the administrative system of Akbar
(2) the administrative system of Shivaji

MODULE VI

CONTRIBUTION OFMEDIEVALINDIA

Study Time : 25 hrs. Marks : 12

Approach This module is designed to highlight the salient features of the social, economic, religious and cultural life of the people is medieval India so as to develop appreciation of the efforts towards the developmentof a composite culture. The richness and variety of our art and styleof architecture reflect the synthesis of various cultures.

Pre -requisite

- Contribution of the important rulers of medieval India.
- Difference in State policy between the Sultanate and the Mughal Empire.

CONTENTUNITS

Unit 1 Administrative system and Military organization

General Foundation 1.1 Administrative System : Nature of the Delhi Sultans and the Caliphate

— Secularism under Akbar
— Central Administration
— Provincial Administration
— Local Administration

General Foundation 1.2 Military Organisation : Military System during the Sultanate period

— The mansbdari system of the Mughals.

Unit 2 Social and Economic Conditions

Certification 2.1 Social Conditions : Feudal Society : The Sultans; the Nobles and the Slaves

— The Mughal nobility, middle class and masses
— Growing disparity in life-style
— Social customs, manners and education
— Social decline

Certification

Economic Conditions : General prosperity

- Prices and Wages
- Land revenue system
- Trade and Commerce

Unit 33 Religious policy

General Foundation 3.1 Religious policy of Delhi Sultante

— Interaction of Islam and Hinduism
— The Bhakti Movement - Vaishanavites
— The Sufism
— Contribution of Amir Khusrau

Certification 3.2 Religious Policy of the Mughals

— Akbar and Din-i-illahi
— Towards cultural synthesis
— Aurangzeb and alienation of Rajputs, Sikhs and Maradhas,

Unit 4 Development of Culture

Certification — Architecture under the Sultanate

— Architecture under the Mughals
— Development of languages and literature
— Arabic, Persian, Sanskrit, Urdu and Regional Languages : Tamil, Hindi, Bengali and Marathi.
— Mughal painting; Music and Dance ; other arts, Gardening, Pottery, Metal-works, Jewellery and Textiles.

Suggested Activities for Extended Learning — Visiting any local medieval forts, palaces, gardens, museums. — Locating cultural centres on a map of India.

— Listing architectural specimens of the Mughal period.
— Study of the literary developments in the regional languages.
— A select study of the composition of the Sufi and the Bhakti saints.
— Study the different styles of architecture during the period.
— Study the different schools of painting during the Mughal period.
— Collection of printed paintings of Mughal period published by the Publication Division, Patiala House, New Delhi - 1.

MODULE VI

RENASCENT INDIA

Study Time : 20 hrs. Marks : 08

Approach This module is designed to promote a critical look at the British policy which transformed a trading company into a sovereign power and to study the impact of modern western ideas on the Indian society which contributed to the social awakening the religious reform movements.

Pre-requisite Knowledge

* Knowledge of the advent of European tradingcompanies i the

Portugueses, the Dutch, the French and the English East India company.

* Knowledge of social conditions of Indian in the 1 9th centu

CONTENT UNITS

Unit 1 Establishment of British Rule in India

General Foundation Nations

1.1 Advent of the European Trading

- New trade routes to India and advent of European trading companies.
- Growth of the English East India Company
- Causes of Success of the English East India Company.

General Foundation India Company

1.2 Territorial expansion of the East

- Bengal, Avadh, Mysore and Sind
- The fall of the Marathas
- British policy towards Nepal, Burma and Afghanistan

General Foundation

1.3 Economic Impact of British Rule

- Land Revenue Policy-The Permanent Settlement, the Ryotwari, the Mahalwari system
- Economic exploitation of India
- Development of modern industries and export policy

Unit 2 Assessment of the British Rule

Certification administration in Bengal

- Dual System of Company's

- System of Subsidiary Alliance
- Doctrine of Lapse
- Assessment of agricultural

and industrial policies.

– Ruin of Handicrafts
– Darinof wealth
– A Balancesheet of British Rule in India

Unit 3 English Education in India

General Foundation - Early Missionary efforts and private enterprise

– Contributions of to the growth of English education in India.
  (i) Raja Rammohan Roy
  (ii) Macaulay
  (iii) William Bentinck
  (iv) M.G. Ranade

Certification

– Deccan Education Society
– Development of education in the 20th century
– Growth of professional education
– Move towards universalisation of elementary education and equal educational opportunity. **Unit 4 Religious Reform Movements**

Certification

– The Brahmo Samaj and Raja Rammohan Roy
– The Prarthana Samaj and Mahadev Govind Ranade
– Arya Samaj and Swami Dayanand Saraswati
– The Ram Krishna Mission and Swami Vivekanand
– The Theosophical Society and Annie Besant
– The Aligarh Movement and Sayyid Ahmed Khan

Unit 5 Social Reforms

– Abolition of Sati and Female Infanticide
– Widow remarriage and education of women
– Removal of untouchability and emphasis on social equality:
– Role of (i) Jyotiba Phule (ii) B .R. Ambedkar, (iii) Mahatma Gandhi
– Social legislation
– Servants of India Society

Suggested Reading Activities for Extended Learning

* Compare the boundaries of British territories in India in 1757 and

1857

* Study the historical importance of (i) Sultan Siraj-ud-daulah (ii) Mir Qasim (iii) Tipu Sultan
* Prepare a time line showing the birth of Brahmo Samaj, Prarthana Samaj, Arya Samaj, Theosophical society, Aligarh movement, Ram Krishna Mission.
* Read the biographies of Raja Rammohan Roy, Mahadev Govind Ranade, Swami Dayanand, Sayyid Ahmed and Vivekanand and collect their views.
* Visit a local Arya Samaj centre or Ram Krishna Mission and assess its activities.
* Visit a nearby social welfare organisation and study its activities relating to promotion of education among women and deprived sections of Indian population and removal of untouchability.

MODULE V I

INDIA'S STRUGGLE FOR INDEPENDENCE

Study Time : 40 hrs. Marks : 22

Approach

This module is designed to examine critically the struggle for independence in order to highlight the fact that this struggle involved people of all regions and religious communities of India. The National Movement regarded political independence as the essential pre-requisites for the reconstruction of Indian society. It became a movement under the leadership of Mahatma Gandhi. It also exposedthe British policy of divide and rule.

This module also highlights the significant achievements of India since independence, inculcation of democratic values, economic resurgence, social mobility, cultural development and advances in science and technology. It also stresses India's role in world affairs with special reference to our neighbours and contribution to world peace.

Pre -requisite

- Impact of the British rule in India, in more ways than one, was responsible for the national struggle for independence.
- The social and religious reform movements of the 19th century played an important role in the development of Indian nationalism.

CONTENT-UNITS

Unit 1 The Revolt of 1857

General Foundation Certification

1.1 Causes : remote and immediate ; course of the Revolt 1.2 Nature, Causes of failure and Results of the Revolt.

Unit 2 Factor contributing to the growth of Indian Nationalism

Cert ification

— British policy : political and economic
— Administrative unification of the country
— Introduction of Western ideas and institution
— A new awakening through Western education; rediscovery of India's past
— Economic exploitation
— Racial discrimination
— Impact of press and literature
— Impact of social and religious reforms.

Unit 3 Indian National Movement (1885-1905)

General Foundation

— Early political movements
— Establishment of the Indian National Congress
— Policy of Indian National Congress till 1905
— British Government's attitude towards the Indian NC

General Foundation

Unit 4 Growth of Indian National Movement (1906-1918)

- The partition of Bengal and its consequences
- The Swadeshi and Boycott Movements
- Formation of the Muslim League (1906)
- The Moderates and the Extremists: The Surat split of Indian National Congress (1907)
- Inadequacy of Morley Reforms
- The Revolutionary Activities
- The Home Rule Movement
- Lucknow Pact (1916)
- Emergence of Mahatma Gandhi
- Champaran Satyagraha

General Foundation

Unit 5 Struggle for Freedom (1919-1942)

- The Montague-Chelmsford Reforms
- The Rowlatt Act
- The Jallianwala Bagh Massacre
- The Swarajists
- Resurgence of the masses
- The Simon Commission
- Hindu-Muslim Relations
- Lahore Congress and Poorna Swaraj
- Revival of Revolutionary Activities
- Civil Disobedience Movement
- Round Table Conference
- Growth of Socialist Ideas
- Formation of Congress Ministries
- International Developments and the Congress
- All India State People Movement
- New Communal Trends.

Certification

Unit 6 Towards Poorna Swaraj 1942-1947

- World War II and the Cripps Mission
- Quit India Movement
- Subhas Chandra Bose and the Indian National Army
- Interim Government
- Partition of India
- Emergence of a Socialist, Secular and Democratic Republic. *Certification*

Unit 7 An Over-View

- Features of the freedom movement

— Participation by the masses

— Emphasis on social reforms :-

(i) Removal of Untouchability

(ii) Emancipation of Women

— Economic planning and rural reconstruction

— Secular character

— Leaders from all regions

Role of :

1. Abul KalamAzad
2. Annie Besant
3. Bal Gangadhar Tilak
4. Bhagat Singh
5. C. Rajgopalachari
6. Gopal Krishna Gokhale
7. Jawahar Lal Nehru
8. Lala Lajpat Rai
9. Mahatma Gandhi
10. Muhammad Ali Jinnah
11. Sardar Patel
12. Sarojini Naidu
13. Subhas Chandra Bose
14. Subramania Bharati
15. V.D. Savarkar

Certification

Unit 8 India Since Independence

— Integration of princely states (1947-58)

— Reorganisation of the Indian States.

— India- A Democratic Republic

— Democratic planning, process.

— Social Mobility—Decline of cast rigidities and untouchability.

— Emancipation of woman.

— Development of science and technology.

— Problem of national integration.

— Principles of Indian Foreign Policy

— Indo-Pak Relations

— Sino-Indian Relations

— India's Relations with Bangladesh

— Non-Alignment Movement.

Suggested Activities for

Extended Learning — Visiting a nearby school/public library and collect material about the role of national leaders in the freedom struggle as listed above.

— Identifying important Centres of National Movement on a given map of India.

— Studying the text of (i) the Pledge of Independence on 20th January, 1930 (ii) The Quit India Resolution of 8th August, 1942. (iii) Nehru's address to the Constituent Assembly of 15th August 1945.

— Prepare a list of important Indian Exports in 1946-47.

— List the major Princely states which integrated with the Indian Union with dates.

MODULE IX

MAPS

Study Time : 30 hrs.

Approach This module is designed to acquaint the learner with the historical geography ofIndia from the pre-historic period to the attainment of independenceso as to relate the past to the present for reinforcing the knowledgeand understanding of the content areas covered under the above modules (I to IX).

Pre -requisite Knowledge

- Knowledge of important historical land-marks covered in the module I to IX.
- Knowledge of important historical sites and geography of India.
- Knowledge of successive changes in the political map of India through the ages.

CONTENT- UNITS

General Foundation **Unit 1 Maps**

The Palaeolithic and the Neolithic settlements.

Ancient Trade Centres.

Empire of Kanishka.

The Gupta Empire.

Empire of Harsha

India's Contact with Asian Countries.

India in 1210 A.D.

1.8 India under the 1.9 Tughlaqs

1.10 India in the 15th Century
1.11 The Mughal Empire in 1605 A.D.
1.12 Kingdom of Shivaji 1680
1.13 Anglo-French War- 1740-1761
1.14 Indian and European Settlements in 1705 A.D.
1.15 Major Indian States in 1750 A.D.
1.16
1.17 British Empire in India in 1805 A.D.
1.18 Kingdom of Ranjit Singh
1.19 Important Centres of the Revolt of 1857.
1.20 Major Indian States on the Eve of Independence
Famines in India in the 19th and 20th Centuries
Partition of India in 1947

Certification

Unit 2 Maps

2.1 Sites of the Harappan Culture
2.2 Asoka's Empire
2.3 South India in 750 A.D.
2.4 The Chola Empire
2.5 The Khalji Empire 1320 A.D.
2.6 Political conditions of India in 1525 A.D.
2.7 The Mughal Empire in 1707 A.D.
2.8 The Maratha Empire in India in 1760 A.D.
2.9 The British Empire in 1856 A.D.
2.10 Important Centres of The Freedom Movement from 1920-47.

Pre -requisite Knowledge

* Studying the content of the various units with the map listed above.
* Practising the location/identification of the important historical places, trade routes, and centres, places related to national movements.
* Use visual aids e.g. wall maps and historical Atlas wherever necessary to understand the appropriate textual material of the content.

S

WEIGHTAGE IN TERMS OF MARKS FOR EXTERNAL EXAMINATION

S .No.	Modules	Marks	Weightage of study hours	
			Foundation	Certification
(i)	Ancient Indian History	08	10	15
(ii)	Climax of Ancient India	10	10	15
(iii)	Legacy of Ancient India	12	10	15
(iv)	Rise and Fall of the Delhi Sultanate	08	10	10
(v)	The Mughal Empire	10	15	15
(vi)	Contribution of Medival India	12	10	15
(vii)	Renascent India	08	10	10
(viii)	India's Struggle for Independence	22	15	25
(ix)	Maps	10	10	20
	Total	100	100	140

Sr. Secondary Course (Syllabus)

HOME SCIENCE

1. RATIONALE

Home Science is a Subject, which promotes understanding of each of the home with necessary scientific basis and provides essential knowledge to face the changing ways of life. An attempt has been made to develop a course by adoping an integrated approach towards the application of science, technology and humanities in areas like resource management, mind the fact that the Senior Secondary stage could be the terminal point of study for most learners this course not only better equips them to deal with problems on thehome front but also offers information on advanced vocational streams for those whodecide to pursue a career.

2. OBJECTIVES

The comprehensive objectives of teaching Home Science at this level are to _

- develop a scientific approach through application of science and technology in everyday living.
- promote awareness of ill-effects of environmental degradation on human lives;
- explain principles and techniques to handle problems in middle childhood and adolescence;
- impart advanced knowledge of textiles;
- explain the need and basis of therapeutic nutrition.

3. DISTRIBUTION OF MARKS

Module	***Marks***
THEORY	
Resource Management	16
Development in Middle Childhood	16
Fabric Science	16
Food and Nutrition	16
Optional Module	16
	80
PRACTICAL	**20**
Total	**100**

4. COURSE DESCROPTION:

The course has been divided into two parts: the CORE modules and some OPTIONAL modules. The core modules comprise four in member and impart knowledge and information, which is essential for all learners. These are compulsory for all students of the course. There are three optional modules out of which the students have to choose and study any one module.

CORE MODULES

4.1 RESOURCE MANAGEMENT

This modules is designed to familiarize the reader with the concept of conservation of energy, to create a sense of maintaining ethics at work, to develop skills in money management, and to show how the available space and time can be effectively used to maximize output.

4.1.1 SCOPE OF HOME SCIENCE

- need
- scope
- employment opportunities

4.1.2 CONSUMER EDUCATION

- Definition
- Problems faced
- Consumer Protection Act
- Consumer redressal

4.1.3 WORK ETHICS

- meaning and importance
- competence and work ethics

4.1.4 INCOME MANAGEMENT

- definition
- recording income and expenditure
- supplementing income. **4.1.5**

SAVINGS AND INVESTMENT

- importance and methods of saving
- agencies of investment
- financing agencies **4.1.6**

WORK ORGANISATION

- meaning and need
- principles of work simplification
- time and energy management

4.1.7 SPACE ORGANISATION

- meaning and need
- space of work simplification
- space organization and aesthetics

4.1.8 ENERGY AND CONSERVATION

- meaning and need
- areas where energy can be conserved
- at home and work place
- non conventional sources of energy

4.1.9 ENVIRONMENT MANAGEMENT

- environment degradation
- effects on man
- creating an eco-friendly environment

4.1 DEVELOPMENT IN MIDDLE CHILDHOOD

This module gives information about the growth and development of children and adolescents and the factors influencing the same. It also sensitizes the student to the situation of the child in India.

4.2.1 GROWTH AND DEVELOPMENT IN MIDDLE CHILDHOOD

- characteristics of physical, motor, socio-emotional, cognitive and language development
- role of peers
- socialization at school

4.2.2 ADOLESCENCE

- characteristics of physical, motor, socio-emotional, cognitive and language development
- self concept
- developmental tasks
- sex education at school
- problems faced by adolescents

4.2.3 SPECIAL ISSUES IN CHILD DEVELOPMENT 3

- position and role of girl child
- juvenile delinquency
- child labour
- major physical disabilities
- socio-economic disadvantage children

4.2 FABRIC SCIENCE

This module aims at familiarizing the reader with the basic properties of the various fabrics, yarn and fabrics available in the market today, how to select fabrics for various end uses, and how a variety of designs can be obtained through weaves, finishes, colours and dyes. Some essential information on care and maintenance of clothes has also been given in the modules.

4.3.1 INTRODUCTION TO FABRIC SCIENCE

- definition and scope
- fibre-definition and classification
- properties of fibers

4.3.2 YARNS

- definition, terminology
- yarn processing
- yarn types
- textured yarns

4.3.3 FABRIC CONSTRUCTION

- meaning
- techniques of fabric construction
- weaving – process and designing
- knitting
- weaving vs knitting

4.3.4 TEXTILES FINISHES

- definition, importance and classification of finish as routine and special.
- Finishing with colour
- Printing, tie and dye batik

4.3.5 SELECTION OF TEXTILES AND CLOTHING

- labels and marketing
- malpractices
- judging quality of textile products.
- Selection of fabrics for different end uses
- Selection of clothing for different age group

4.3.6 CARE AND MAINTENCES

- need
- general principles
- storage of clothes

4.3 FOOD AND NUTRITION

This module gives useful information about foods, their functions, nutrients and their requirement. It equips one to plan and understand adequate meals and ways to combat them. Readers will also be able to modify diet to suit certain common diseased conditions.

4.4.1 YOU AND YOUR FOOD

- definition of food
- functions of food
- food group

4.4.2 NUTRITION

- definition
- nutrients-functions and source
- nutrient requirements –RDI based on household measures and food groups.

4.4.3 ADEQUATE MEALS

- balanced diet
- need for mean planning
- factors affecting meal planning
- meals for various age group
- modification of family meal
- hygienic foods handing **4.4.4 NUTRITONAL**

STATUS AND HEALTH

- malnutrition
- assessing nutritional status
- height and weight
- diet and nutrient intake
- recognizing deficiency disorders: anemia, PEM, vitamin A and iodine
- on going governmental and non-governmental nutrition programs

4.4.5 NUTRITIONAL CARE OF SICK IN FAMILY

- need for special care
- diet modification
- diet in common diseases: diarrhea, constipation, fever jaundice high blood pressure & diabetes
- diet in nutrition related problems: PEM anemia, vitamin A deficiency and obesity.

4.4.6 PURCHASE AND STORAGE OF FOOD

- selection of food
- food spoilage
- methods of storage **4.4.7**

FOOD PRESERVATION

- general principles of preservation
- preservation at home

ADDISON

RDE The future of a country depends on the state of health of its population. One has to understand the significance of good health of a community with reference to national

development. This module will bring awareness of the common nutritional problems facing India and at the same time describe the various methods used to assess the ongoing nutritional programmes in the community. The modules will give sufficient knowledge on planning and conduction nutrition education programmes in a community.

4.5.1 NATRITIONAL STATUS – ITS ASSESSMENT

- methods of assessment
- anthropometry
- clinical
- diet survey

4.5.2 NUTRITION EDUCATION METHODS

4.5.3 MAJOR NUTRITION PROBLEMS IN INDIA

- extent of major nutrition problems observed in India – energy def. , PEM, anemia, deficiency of Vitamin A,B and iodine, fluoride toxicity and obesity
- Government programmes and policies.

[redacted]

[redacted] This module will provide the essential knowledge for providing services to the under fives short periods, from the home itself. It will enable the reader to work efficiently at a day care centre / blawadi / home tutorial programme. It is also partly aimed at developing parenting skills in the young readers.

4.5.1 MEANING, NEEDS, OBJECT IVES

- meaning of home based care
- need-working parents / nuclear families
- objectives – safe Physical environment / stimulating activities / learning opportunities / preparation for school.

4.5.2 REQUIREMENTS / ESSENTIALS

- organizing and preparing available space
- equipment
- play materials
- safety / first aid

4.5.3 ORGANIZING ACTIVITIES

- creative activities
- preparing and using learning materials
- materials from environment

4.5.4 NUTRITIOUS MEALS

- creating nutritious snacks
- developing proper eating habits

4.5.5 ACCOUNTS

- setting up and starting the service
- records / costing / account knowledge

[redacted]

[redacted] This module will equip the readers with the skill to launder various type of fabrics and use the appropriate procedures as required. Learners will be in a position to provide professional services and set up their own units if required.

4.5.1 FABRICS AND LAUNDRY

- properties related to care and maintenance of – cotton, silk , wool, synthetics.

4.5.2 CLEAN EARS AND LAUNDRY AUXILIARIES

- characteristics, function and uses of soaps, detergent, blues, starchiest.

4.5.3 STAIN REMOVAL

- identifying stains
- methods of removal

4.5.4 WASHING AND FINISHING

- washing of cotton, silk, wool, synthetics
- special treatment given to heavy, light, delicate fabrics
- dirty articles

4.5.5 CLOTH MAINTENANCE

- ironing
- pressing
- folding
- for collection, washing, drying, ironing and holding

4.5.6 SETTING UP A UNIT

- setting up and starting the service

LIST OF PRACTICALS

1. To prepare a label depicting each of the following marks of standardization: i) ISI ii) FPO iii) agmark.
2. To fill various forms at a bank: i) cheques ii) pay in slip iii) withdrawal form.
3. To study the resource use pattern of various family members at your home.
4. To list habits of members of your family and neighbors which degrade the environment and suggest ways to conserve it.
5. To identify the discriminations against a girl child (if any) in your family and find justifications for the same.
6. To identify a child labourer in your locality and develop a profile of the child.
7. To identify a child with special needs and study the family's efforts in his/her achieving independence.
8. To develop a questionnaire to study a family's efforts in helping an adolescent achieve the developmental tasks.
9. To identify various types of fibers using: i) burning test ii) visual inspection.
10. To find out the thread count of different types of fabrics.
11. To tie and dye a cotton fabric using various methods of typing.
12. To remove the following stains from white cotton fabrics: i) curry ii) blood iii) mud iv) ink v) tea/coffee.
13. To prepare simple dishes using the following methods of food enrichment i) combination ii) fermentation iii) germination.
14. To study the nutritional intake and its effect on the nutritional status of a family by maintaining a food dairy.
15. To study the programme at a play center to determine the center's role in: i) socio-emotional development ii) physically motor development iii) cognitive development.

KASHMIRI

(Cade No. 508)

CLASS XII

BRIEF

One Paper **Time : 1 Hour** **Marks : l00**

Unit/Areas of Learning		**Marks**
A.	Advanced Reading Skills	10
B.	Effective Writing Skills	20
C.	Applied Grammar and Translation	20
D.	Literature and Criticism	50

LANGUAGES Marks Suggested

Periods

Section A : Advanced Reading Skills **10**

(i) An unseen passage of 150 words followed by 4 short question to text comprehension and to provide a suitable heading

Section B : Effective Writing Skills **20**

(i) Creativewriting

Section C : Applied Grammar and Translation **20**

(i)	Making of compound sentences from simple sentences	05
(ii)	Correct of tense	05
(iii)	Identification of noun phrases and verb phrases	05
(iv)	Translation of a passage of 50 words/5 sentences (from English into Kashmiri)	05

Section D : Literature and Criticism **50**

1.	Prose		12
	(i)	Explanation of a prose passage out of two with reference to their context	05
	(ii)	Sum and substance of a lesson with alterantive	07

Lessons to be studied :

(i) Vanka

(ii) Dante

(iii) Taph

(iv) Tote Senz Kath

(v) Shekhsiyat

(vi) Kasheere hund Ound Foukh

2. Poetry **15**

Poems to be studied :

(i) Faryaad

(ii) Noshlab chhai phairan Bagus

(iii) Akh Proon Shahar

(iv) Aka Nandun

(v) Bulbulas Kun

(vi) Hqndi phanoos

3. Identification of new words/images in a given extract.

4. Criticism **15**

Question shall be based on the exercises of the lesson

(alternative to be provided)

(i) Discussion on the theme of a poem.

(ii) Sum and Substance of oue poem out of the two offered

Book Prescribed :

Kashur Nisab (for Class XII) published by the J&K State Board of School Education 1986 Edition.

MALAYALAM

(Cade No. 509)

CLASS XII

BRIEF

One Paper **Time : 1 Hour** **Max. Marks : l00**

			Marks
			25
1.	**Grammar:**		**20**
	Elementary metres and alankaras		
	1. Upama		
	2. Utpreksha		
	3. Atishyokthi		
	4. Rupakam		
2.	**Writing Skills**		**25**
	A general study of newspapers/magazines and periodicals		
	in the language with the object of writing		
	(i)	Reportsofsimpleevents	05
	(ii)	Letter to Editor	10
	(iii)	Comprehension of an unseen passage followed	
		by short question	10
3.	**Prose, Poetry**		**50**

1. Text book : 'SAHITYA DARPANAM'Collection of Essays, Stories and Poems Prescribed by SCERT., Govt. of Kerala Pub. by All Saints International CMS College Road, Kottayam,Kerala (2005 Edition.)
2. Moulana Abul Kalam Azad (Biography) by Dr. M. Leelavathy Pub. by Lipi Publications, Kozhikode Prescribed by SCERT, Govt. of Kerala (2003 Edition.)
3. Vidura Bhiksha by Ulloor (Poem) Prescribed by SCERT Govt. of Kerala (Complete text) Pub. by Ulloor Publications, Thiravanthapuram, Kerala.

মণিপুরী (এমঃ আইঃ এলঃ)

ক্লাস XI

মতম — পূং ৩ | অপূনবা মার্ক — ১০০ | অপূনবা পেরিয়দ — ১৩০

(ক) মার্ক য়েম্বোকপগী মওং

	হীরম		মার্ক		পেরিয়দ
১।	পাবা	—	১০	—	১০
২।	ইবা	—	২৫	—	৩০
	(i) রচনা (এসে) (রিফ্লেক্টিভ/ইমাজিনেটিভ) - মার্ক ৮				
	(ii) চিঠি (ফোর্মেল) - মার্ক ৬				
	(iii) ৱা মচং (প্রেসি) - মার্ক ৫				
	(iv) ইবগী অতৈ মহৈশিং (ডেস্ক্রিপ্টিভ আর্টিকল, সমেরি, নোটিস, মেসেজ, ষ্টোরি) - মার্ক ৬				
৩।	শৈরেং	—	২৫	—	৩০
৪।	ৱারেং	—	৩০	—	৪৫
৫।	ফংসনেল গ্রামার	—	১০	—	১৫
			১০০		১৩০

(খ) তমগদবা লাইরিক্কী মমিংশিং — **অফোঙবা**

১।	অপূনবা মণিপুরী ৱারেং শৈরেং (এম: আই: এল: ক্লাস XI)	—	কাউন্সিল ওফ হাইয়র সেকেণ্ডরি ইডুকেসন, মণিপুর
২।	মতমগী মণিপুরী গ্রামার অমসুং কম্পোজিসন	—	কাউন্সিল ওফ হাইয়র সেকেণ্ডরি ইডুকেসন, মণিপুর

(গ) তমগদবা শৈরেংশিং — **মার্ক ২৫**

১।	মৈতৈ চনু	—	লমাবম কমল সিংহ
২।	লমন	—	হিজম অঙাংহল সিংহ
৩।	নাইতোম তাবা যাত্রী	—	রাজকুমার ঝালজিৎ সিংহ
৪।	মণিপুর	—	এলাংবম নীলকান্ত সিংহ
৫।	ইরৈপাক	—	অরাম্বম দরেন্দ্রজিৎ সিংহ

৬। চরূগী মী – রাজকুমার মধুবীর

৭। আপোকপা মপুগী তুংনফম – নাওরিয়া ফুলো

(ঘ) তমগদবা ৱারেংশিং মার্ক ৩০

১। ফৌ চরোং (ৱারী মচা) – আর. কে. এলাংবম

২। তৌগদবা থবক্তা মাই ওনশিল্লু, নোম্মু তনগনু – খ্বাইরাকপম চাউবা সিংহ

৩। ইমা খুল্লাকপীগী নোংগাংহৈদো – কুমারী খাইদেম প্রমোদিনী

৪। শান্নবদা মণিপুরীশিং – লৈশাংথেম অঞ্জিৎ সিংহ

৫। এডোলেসঙ্গ এডুকেশন – ৱাংখৈময়ুম তোমচৌ সিংহ

(ঙ) তমগদবা গ্রামারগী শরুকশিং মার্ক ১০

১। সিলেবল অমসুং কোন্সনন্ত ক্লস্তর

২। তোন (ৱাহৈগী অরূম-অয়াং)

৩। ৱাতপ (এজিক্স

৪। সন্ধি অমসুং সমাস

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DESIGN
QUESTION PAPER/UNIT TEST

Subject : MANIPURI
Class : X
Time : 3 Hours
Full Marks : 100

I.	**WEIGHTAGE TO OBJECTIVES :**						
	Objectives	**K**	**C**	**Exp.**	**S**	**Total**	
	Percentage of Marks	20	40	40	-	100	
	Marks	20	40	40	-	100	
II.	**WEIGHTAGE TO FORM OF QUESTIONS :**						
	Forms of Questions	**E**	**SA-I**	**SA-II**	**VSA**	**O**	**Total**
	No. of Questions	5	8	9	20	5	47
	Marks Allotted	33	24	18	20	5	100
	Estimated Time (in Minutes)	71	48	36	20	5	180
III.	**WEIGHTAGE TO CONTENT :**						
		Units/Topics					**Marks**
	A.	Reading					10
	B.	Writing					25
	C.	Poetry					25
	D.	Prose					30
	E.	Functional Grammar					10
		Total					**100**
IV.	**SCHEME OF SECTIONS :** 5 Sections (A, B, C, D and E)						
V.	**SCHEME OF OPTIONS:** Internal options in Essay Type Questions only.						
VI.	**DIFFICULTY LEVEL :** **Difficult : 15% marks** **Average : 50% marks** **Easy : 35% marks**						

Abbreviation : K (Knowledge), C (Comprehension), Exp (Expression), S (Skill), E (Essay Type), SA (Short Answer Type), VSA (Very Short Answer Type), O (Objective Type)

মণিপুরী (এমঃ আইঃ এলঃ)

ক্লাস XII

মতম – পূং ৩ অপূনবা মার্ক – ১০০ অপূনবা পেরিয়দ – ১৩০

(ক) মার্ক য়েম্থোকপগী মওং

	হীরম		মার্ক		পেরিয়দ
১।	পাবা	–	১০	–	১০
২।	ইবা	–	২৫	–	৩০
	(i) রচনা (এসে) (রিফ্লেক্টিভ/ইমাজিনেটিভ) - মার্ক ১০				
	(ii) চিঠি (ফোর্মেল) - মার্ক ৬				
	(iii) ইবগী অতৈ মহৈশিং (পেরেগ্রাফ রাইটিং/এমপ্লিফিকেসন, রিপোর্ট, আর্টিকল, এডভর্টিজমেন্ট, ইনভাইটেসন, ইন্সট্রক্সন) - মার্ক ৯				
৩।	শৈরেং	–	২৫	–	৩০
৪।	ৱারেং	–	৩০	–	৪৫
৫।	ফংসনেল গ্রামার	–	১০	–	১৫
			১০০		১৩০

(খ) তমগদবা লাইরিক্কী মমিংশিং অফোঙবা

১।	অপূনবা মণিপুরী ৱারেং শৈরেং (এম: আই: এল: ক্লাস XII)	–	কাউন্সিল ওফ হাইয়র সেকেণ্ডরি ইডুকেসন, মণিপুর
২।	মতমগী মণিপুরী গ্রামার অমসুং কম্পোজিসন	–	কাউন্সিল ওফ হাইয়র সেকেণ্ডরি ইডুকেসন, মণিপুর

(গ) তমগদবা শৈরেংশিং মার্ক ২৫

১।	মৈতৈ কবি	–	খাইরাকপম চাউবা সিংহ
২।	নোঙ্গুম্নকখোদা	–	অশাংবম মীনকেতন সিংহ
৩।	লৈ লাংবা	–	লাইশ্রম সমরেন্দ্র সিংহ
৪।	অনৌবা কুমগী কুমদমখোন	–	রাজকুমার সুরেন্দ্রজিৎ সিংহ
৫।	ডিখৌগী তোববান্দা	–	হিজম ইরাবত

৬।	য়োংগী জগোই	–	নোংথোম্বম শ্রীবীরেন
৭।	লাইরবগী ৱারী	–	থাংজম ইবোপিশক

(ঘ) তমগদবা ৱারেংশিং মার্ক ৩০

১।	মৈতৈ নুপী	–	এস. কৃষ্ণমোহন
২।	অকোয়বগী ফিভম ঙাকশেনবা	–	ডা: বি. মণিহার শর্ম্মা
৩।	ঐগী থাহৌদ্রবা হৈতুপ লালু	–	এম. কে. বিনোদিনী দেবী
৪।	বিজ্ঞান অমদি মীওইবা	–	প্রো. ঐচ. নন্দকুমার শর্ম্মা
৫।	ঈনখৎলকপা চহী মতাং অমদি এইডস	–	ডা. ওয়নাম ইবোচাউবা সিংহ
৬।	হুক	–	ডা. লনচেনবা মীতৈ
৭।	হিজম ইরাবত সিংহ	–	শিজগুরুময়ুম নীলবীর শর্ম্মা শাস্ত্রী

(ঙ) তমগদবা গ্রামারগী শরুকশিং মার্ক ১০

১।	ফ্রেজ অমসুং ক্লোজ
২।	ৱাহৈ পরেং মখলশিং অমসুং মখোয়গী হোংদোক-হোংজিন তৌবা
৩।	তেন্স
৪।	প্রমাণ-পাম্থৈ অমসুং পাউরৌ (ইডিয়মস এণ্ড প্রোভর্বস)

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DESIGN
QUESTION PAPER/UNIT TEST

Subject : MANIPURI
Class : XII
Time : Three Hours
Full Marks : 100

I. WEIGHTAGE TO OBJECTIVES :

Objectives	K	C	Exp.	S	Total
Percentage of Marks	20	40	40	-	100
Marks	20	40	40	-	100

II. WEIGHTAGE TO FORM OF QUESTIONS :

Forms of Questions	E	SA-I	SA-II	VSA	O	Total
No. of Questions	4	9	9	20	5	47
Marks Allotted	30	27	18	20	5	100
Estimated Time (in Minutes)	65	54	36	20	5	180

III. WEIGHTAGE TO CONTENT :

	Units/Topics	Marks
A.	Reading	10
B.	Writing	25
C.	Poetry	25
D.	Prose	30
E.	Functional Grammar	10
	Total	**100**

IV. SCHEME OF SECTIONS : 5 Sections (A, B, C, D and E)

V. SCHEME OF OPTIONS : Internal options in Essay Type Questions only.

VI. DIFFICULTY LEVEL :

Difficult : 15% marks
Average : 50% marks
Easy : 35% marks

Abbreviation : K (Knowledge), C (Comprehension), Exp (Expression), S (Skill), E (Essay Type), SA (Short Answer Type) VSA (Very Short Answer Type), O (Objective Type)

MANIPURI

(Cade No. 510)

CLASS XII

BRIEF

One Paper **Time : 1 Hour** **Max. Marks : l00**

			Marks
			10
1. (a)	**Grammar:**		**10**
	(i)	Pharase and clause	
	(ii)	Sentences and its Transformations	
	(iii)	Shandhi and Samas (Compound words)	

Manipuri Grammar Published by Council of Higher Education, Manipur.

(b)	**Composition**		10
	(i)	Comprehension	
	(ii)	Amplification (Idioms and Proverbs)	
2.	**Prose and Poetry**		**40**
A.	**Prose**		
	(i)	Expanation of the passages from the text.	
	(ii)	Short messages	
	(iii)	Questions on the text	

Lessons to be studied : (05)

(i)	Potsangbam Khongnang	by Asangbam Minaketan Singh
(ii)	Lei Langba	by Sinam Krishna Mohan Singh
(iii)	Akoibagi Phibham Ngak Senba	by Dr. B. Manihar Sharma
(iv)	Eigi Thahoudraba Heitup Lalu	by M.K. Binodini Devi
(v)	Hijam Irabot	S. Nilbir Sharma Shastri

Prescribed book : Apunba Manipuri Wareng Sheireng, Published by Council of Higher Sec. Edu. , Manipur

B.	**Poetry**		**40**
	(i)	Explanations of passages (from the text)	
	(ii)	Questions on the text.	
C.	**The following Poems are recommended as :**		**10**
	a)	Meitei Kabi	by Khwairakpam Chaoba Singh
	b)	Lei Longba	by Laishram Samarendra Songh
	c)	Anouba	by R.K. Srendrajit Singh
	d)	Komrei	by Khumanthem Ibohal Singh
	e)	Dikhougi Torbanda	by Hijam Irabot
	f)	Anouba Thunglaba Jiba	by Thangjam Ibopishak

Prescribed book :

Apunba Manipuri Wareng Sheireng, Published by Council of Higher Sec. Edu., Manipur

SYLLABUS

SENIOR SECONDARY COURSE IN MATHEMATICS

RATIONALE

The curriculum in Mathematics has been designed to cater to the specific needs of NIOS learners. The thrust is on the applicational aspects of mathematics and relating learning to the daily life and work situation of the learners. The course is modular in nature with – eight compulsory modules forming the core curriculum and four optional modules out of which the learner is to choose one optional module. An attempt has been made to reduce rigour and abstractness.

OBJECTIVES

The course aims at enabling learners to :

- become precise, exact and logical.
- acquire knowledge of mathematical terms, symbols, facts and formulae.
- develop an understanding of mathematical concepts.
- develop problem solving ability.
- acquire skills in applying the learning to situation including reading charts, tables, graphs etc.
- apply the above skills in solving problems related to Science, Commerce and daily life.
- develop a positive attitude towards Mathematics and its application.

COURSE STRUCTURE

The compulsory modules are :

1. Complex Numbers and Quadratic Equations
2. Determinants and Matrices
3. Permutations and Combinations
4. Sequences and Series
5. Trigonometry
6. Coordinate Geometry
7. Differential Calculus
8. Integral Calculus

The optional modules are :

9. Statistics and Probability
10. Vectors and Analytical Solid Geometry
11. Linear Programming

MODULE WISE DISTRIBUTION OF STUDY HOURS AND MARKS

Module No.	Compulsory Modules	Minimum Study Hours	Marks
1.	Complex Numbers & Quadratic Equations	15	10
2.	Determinants & Matrices	15	10
3.	Permutations & Combinations	20	08
4.	Sequences & Series	20	08
5.	Trigonometry	30	10
6.	Coordinate Geometry	30	10
7.	Differential Calculus	45	17
8.	Integral Calculus	45	17
	Optional Modules (The learner have to choose any one module)		
9. **10.** **11.**	Statistics & Probability OR Vectors & Analytical Solid Geometry OR Linear Programming	**20 each**	**10 each**
TOTAL		**240**	**100**

CURRICULUM OF SENIOR SECONDARY MATHEMATICS

COMPULSORY MODULES

Module 1: Complex Numbers and Quadratic Equations

Study Time: 15 hrs. Max. Marks: 10

Pre-requisites: Real numbers and quadratic equations with real coefficients.

Content and Extent of Coverage

• **Complex Numbers**

- Definition in the form $x + iy$
- Real and imaginary parts of a complex number.
- Modulus and argument of a complex number
- Conjugate of a complex number

• **Algebra of Complex number**

- Equality of complex numbers
- Operations on complex numbers (addition, subtraction, multiplication and division)

- Properties of operations (closure, commutativity, associativity, identity, inverse, distributivity)
- Elementary properties of modulus namely

(i) $z = 0 \Leftrightarrow z = 0$ *and* $z_1 = z_2 \Leftrightarrow |z_1| = z_2$

Module 2: Determinants and Matrices

$z_1 + z_2$ $\leq z_1 + z_2$

$|z|$

z $|z_2|$ $z\,z$

$_1$ $_1 = {}^1($ $0)_2$

z_2

- **Argand Diagram**

- Representation of a complex number by a point in a plane.

- **Quadratic Equations**
  - Solution of quadratic equation with real coefficients using the quadratic formula
- Square root of a complex number - Cube roots of unity

Extended Learning

- **Polar representation of a complex number**
- **Quadratic equations with complex coefficients**

NOTE :

- "Division by zero is not allowed in complex numbers" to be stressed.
- Lack of order in complex numbers to be highlighted.
- The fact that complex roots of a quadratic equation with real coefficients occur in conjugate pairs but the same may not be true if the coefficients are complex numbers is to be verified using different examples.

Study Time: 15 hrs. Max. Marks: 10

Pre-requisites : Knowledge of number systems; solution of system of linear equations.

Content and Extent of Coverage

- **Determinants and their Properties**
- Minors and Cofactors
- Expansion of a determinant
- Properties of determinants

- **Matrices**
- Introduction as a rectangular array of numbers
- Matrices upto order 3 ×4

- **Types of matrices**
- Square and rectangular matrices
- Unit matrix, zero matrix, diagonal, row and column matrices
- Symmetric and skew symmetric matrices

- **Algebra of matrices**
- Multiplication of a matrix by a number - Sum and difference of matrices
- Multiplication of matrices

- **Inverse of a square matrix -**
Minor and cofactors of a matrix - Adjoint of a matrix
- Inverse of a matrix

- **Solution of a system of linear equations**
  - Solution by Cramer's Rule - Solution by matrix method

NOTE:
- The properties of determinants to include the following:

1. If any two rows or columns of a determinant are interchanged, then

the sign of the determinant is changed.

2. If each element of a row (or column) of a determinant is multiplied by a constant, the value of the determinant gets multiplied by.
3. If k times a row (or column) is added to another row (or column) the value of the determinant remainsunchanged.

- The number of equations and variables to be restricted to three only.

Extended Learning

- **Cramer's Rule** for four or more equations
- **Determinant as a function**
- **Matrix as a function**
- **Matrices over complex numbers**
- **Hermitian and Skew Hermitian**
- **Rank of a Matrix**
- **Inverse by elementary row transformations**
- **Solution of 4 or more than 4 linear equations in 4 more than 4 variables**

Module 3: Permutations, Combinations and Binomial Theorem

Study Time: 20 hrs. Max. Marks: 8

Pre-requisites : Number Systems

Content and Extent of coverage

- **Mathematical Induction**

- Principle of mathematical induction
- Application of the principle in solving problems

- **Permutations**

- Fundamental Principle of Counting
- Meaning of ${}_nP_r$
- Expression for ${}_nP_r$

- **Combinations**

- Meaning of ${}_nC_r$
- Expression for ${}_nC_r$
- Properties of ${}_nC_r$ namely

$${}_nP_r = \frac{n!}{(n-r)!}$$

$${}_nC_r = \frac{{}_nP_r}{r!}$$

$${}_nC_r = {}_nC_{n-r}$$

$${}_nC_r + {}_nC_{r-1} = {}_{n+1}C_r$$

- **Binomial Theorem**

- Binomial theorem for a positive index with proof.

Extended Learning

- **Circular permutations**
- **Pascal's triangle**
- **Binomial theorem for negative index and rational indices (without proof)**

Module 4: Sequences and Series

Study Time: 20 hrs. Max. Marks: 8

Pre-requisites : Permutation, Combination and concept of a function, Exponential functions, Logarithmic functions and their properties, and graphs.

Content and Extent of coverage

- **Arithmetic Progression**

- Concept of a sequence
- A.P as a sequence
- General term of an A.P
- Sum upto 'n' terms of an A.P.

- **Geometric Progression**

- G.P as a sequence
- General term of a G.P
- Sum upto 'n' terms of a G.P.
- Sum upto infinite terms of a G.P.

- **Series**

- Concept of a series
- Some important series, etc. using method of differences and mathematical induction

- **Exponential and Logarithmic Series** - Representation of e^x and $\log(1 + x)$ as series.
- Properties of e^x and $\log(1 + x)$

Extended Learning

- **Arithmetic Mean, Geometric Mean**
- **Harmonic Progression, Arithmetico-Geometric Progression and their relationships**
- **Logarithms on any base**

Module 5 : Trigonometry

Study Time: 30 hrs. Max. Marks: 10

Pre-requisites : Trigonometric ratios of an acute angle.

Content and Extent of coverage

- **Functions**

- Concept of a function
- Domain, codomain and range of a function - Graphs of functions
- Odd and even functions
- Some important functions

- **Composition of Functions**

- Composition of two or more functions - Inverse of a Function

- **Trigonometric Ratios**

- Radian measure of angles
- Trigonometric ratios as functions - Graphs of T-ratios
- Periodicity
- T-ratios of allied angles
- Inverse Trigonometric ratios

- **Addition and Multiplication formulae** - Addition and subtraction formulae for trigonometric functions
- Sines, Cosines and Tangents of multiples and submultiples
- Solution of simple trigonometric equations

Extended Learning

- **Properties of triangles**
- **Solution of triangles**
- **Properties of inverse functions**
- **Trigonometric equations and their solutions**
- **General solution of Trigonometric equations**

Module 6 : Coordinate Geometry

Study Time: 30 hrs. Max. Marks: 10

Pre-requisites: Number systems and plotting of points on a graph.

Content and Extent of coverage

- **Introduction (Basic concepts)**

- Distance Formula
- Section Formula
- Area of a Triangle

- **Straight Line**

- Equation of a straight line in - Slope-intercept form
- Two point form
- Point-slope form
- Parametric form
- Intercepts form

- **General equation of first degree and its relationship with straight line**

- **Parallel and Perpendicular Lines** - Angle between two lines
- Parallel lines
- Perpendicular lines
- Distance of a point from a line
- Distance between two parallel lines - Family of lines

- **Circle**

- Equation of a circle whose radius and centre are given.

- Equation of a circle in terms of extremities of its diameter.
- General equation of a circle
- Equations of tangents and normals
- Parametric representation of a circle.

- **Conic Sections**

- Acquaintance with equation of parabola and ellipse in standard form
- Eccentricity, directrix and focus

NOTE:

- Problems on lines to include questions of the type *l* *lë+* = ' 0
- Conic sections to be introduced through examples of loci and not as a section of a cone.

Extended Learning

- **Locus -** Advanced examples of loci

- **System of Circles**

- Equation of a family of circles passing through the intersection of two circles - Condition for orthogonality of circles - Radical axis of two circles

- **Sections of a cone (Conic sections)**

- Derivation of equations of parabola, ellipse and hyperbola in standard form
- Condition for $y = mx + c$ to be a tangent to these conics
- Point of tangency

- **General second degree equation in two variables**

Condition for it to represent :
- A pair of straight lines
- A circle
- Different conic sections

MODULES 7: Differential Calculus

Study Time: 45 hrs. Max. Marks: 17

Pre-requisites: Trigonometry and Exponential and Logarithmic series

Content and Extent of Coverage

- **Limit and Coverage**

- Notion of limit (left hand and right hand limits)
- Continuity of functions at a point
- Continuity of functions in an interval

- **Differentiation**

- Derivatives from the first principle
- Derivative as instantaneous rate of change - Geometrical meaning of derivative
- Derivative of sum, difference, product and quotient of functions and chain rule
- Derivatives of algebraic, trigonometric, exponential and logarithmic functions.

- **Monotonicity of functions**

- Monotonicity and sign of the derivative - Second derivative of a function
- Maxima and Minima

NOTE:

- The concept of monotonic function will be introduced at the appropriate stage.

Extended Learning

- **Differentials and errors**
- **Approximation**
- **Rolle's theorem**
- **Lagrange's mean value theorem**
- **Derivatives of higher orders**
- **Points of inflexion**
- **Concavity and convexity of functions**

MODULE 8 : INTEGRAL CLACULUS

Study Time: 45 hrs. Max. Marks: 17

Pre-requisite : Differential Calculus

Content and Extent of Coverage

- **Introduction to Integral Calculus -**
  Integration as inverse of differentiation - Properties of integrals

- **Techniques of Integration**
  - Integration by Substitution
  - Integration by parts
  - Integration using partial fractions

- **Definite Integrals**
  - Idea of definite integral as limit of a sum
  - Geometrical interpretation of definite integrals in simple cases.
  - Properties of definite integrals

(i) $\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$

(ii) $\int_a^b f(x)\,dx = \int_a^c f(x)\,dx + \int_c^b f(x)\,dx$

(iii) $\int_0^{2a} f(x)\,dx = \int_0^a f(x)\,dx + \int_0^a f(2a-x)\,dx$

(iv) $\int_a^b f(x)\,dx = \int_a^b f(a+b-x)\,dx$

(v) $\int_0^a f(x)\,dx = \int_0^a f(a-x)\,dx$

(vi) $\int_0^{2a} f(x)\,dx = 2\int_0^a f(x)\,dx$ if $f(2a-x) = f(x)$

$= 0$ if $f(2a-x) = -f(x)$

(vii) $\int_{-a}^{a} f(x)\,dx = 2\int_0^a f(x)\,dx$ if f is an even function of x

= 0 if f is an odd function of x

- Fundamental theorem of Integral Calculus (statement only)
- Application of definite integrals in finding area under a curve

- **Differential Equations**

- Notion of differential equation, its order and degree
- Solution of first order, first degree differential equations

NOTE:

The fact that integral is called primitive, anti-derivative to be specified.

The following types of integrals may be taken up giving appropriate details.

$$\int \frac{dx}{a^2 \pm x^2}, \quad \int \frac{dx}{\sqrt{a^2 - x^2}}, \quad \int \frac{dx}{ax^2 + bx + c}, \quad \int \frac{dx}{\sqrt{ax^2 + bx + c}}, \quad \int \frac{dx}{(px+q)\sqrt{ax^2 + bx + c}},$$

$$\int \frac{px+q}{ax^2 + bx + c}\,dx, \quad \int \frac{px+q}{\sqrt{ax^2 + bx + c}}\,dx, \quad \int (px+q)\sqrt{ax^2 + bx + c}\,dx,$$

$$\int e^{ax} \sin bx\,dx, \quad \int e^{ax} \cos bx\,dx$$

Extended Learning

- **Application of definite integrals in finding the area under a curve**
- **Formation of a differential equation**
- **Higher order differential equations reducible to variable separable cases**

OPTIONAL MODULES
(The learner have to choose any one out three modules)

Module 9 : Statistics and Probability

Study Time: 20 hrs. Max. Marks: 10

Pre-requisites : Mean, median and mode of ungrouped and grouped data.

Content and Extent of coverage

- **Measures of dispersion**

- Range
- Mean deviation
- Variance and standard deviation

- **Random Experiments and Events**

- Ramdom experiments
- Sample space, events
- Types of events, viz. mutually exclusive events and equally likely events

- **Probability**

- Concept of probability
- Use of permutation and combination in probability
- Probability as a function
- Conditional Probability and independent events
- Random variable as a function on sample space.

- **Probability Distribution**

- Introduction to probability distribution - Binomial distribution
- Expected value of a random variable
- Mean and variance of a Binomial distribution.

NOTE:

- Probability to be explained as the ratio of number of cases favourable to an event and the total number of cases.
- Venn diagrams to be used as frequently as possible to give a pictorial representation of the concepts
- Use of addition theorem when product of event is easily identifiable.

Extended Learning

- **Correlation and regression**
- **Curve fitting (fitting a line)**
- **Mean and variance of Poisson distribution**
- **Bivariate probability distributions.**

Module 10: Vectors & Analytical Solid Geometry

Study hrs. : 20 Max. Marks: 10

Pre-requisites: Knowledge of Two-Dimensional Geometry ,Coordinate Geometry and Trigonometry.

Content and extent of Coverage

- **Vectors**

- Scalars and vectors
- Vectors as directed line segments
- Magnitude and direction of a vector - Null vector and Unit vector
- Equality of vectors
- Position vector of a point

- **Algebra of vectors**

- Addition and subtraction of vectors and their properties
- Multiplication of a vector by a scalar and their properties

- **Resolution of a vector**

- Resolution of a vector in two dimensions. - Resolution of a vector in three dimensions - Section formula

- **Co-ordinates of a point**

- Co-ordinates of a point in space. - Distance between two points - Co-ordinates of a division point. - Direction cosines and projection.
- Condition of parallelism and perpendicularity of two lines.

- **The Plane**

- General equation of a plane.
- Equation of a plane passing through three points.
- Equation of a plane in the normal and intercept form.
- Angle between two planes.
- Plane bisecting angles between two planes.
- Homogeneous Equations of second degree representing two planes.
- Projection and Area of a triangle.
- Volume of tetrahedron.

- **The Straight Line**

- Equation of a line in symmetrical form.
- Deduction of the general equation into symmetrical form.
- Perpendicular distance of a point from a straight line.
- Angle between a line and a plane.
- Condition of coplanarity of two lines.

- **The Sphere**

- Equation of a sphere : Centre-radius form.
- Equation of a sphere through four non coplanar points.
- Diameter form of the equation of a sphere.
- Plane section of a sphere and sphere through a given circle.
- Intersection of a sphere and a line.

Extended Learning

- **Skew lines**
- **Intersection of three planes.**
- **Pole and polar plane in a sphere.**
- **Equation of a cylinder and its properties.**
- **Equation of a cone and its properties.**

Module 11: Linear Programming

Study Time: 20 hrs. Max. Marks: 10

Pre-requisites : Matrices

Content and Extent of coverage

- **Introduction**

- Introduction through a real life problem. - Solution by graphical method
- General terms used in linear programming (inequation, objective function, convex polygon, feasible solution, optimal solution, etc.)
- Constraints in a linear programming problem
- Feasible and optimal solutions.
- Simplex method.

- **Applications**

- Dual problem
- Assignment problem
- Transportation problem

Extended Learning

- **Product-mix problem**
- **Duality**
- **Simplex method.**

MIZO

(Code No. 512)

CLASS XII

BRIEF

One Paper	**Time : 1 Hour**	**Marks: 100**
Section A		**40**
Grammar		15
1.	Prefix and Suffix	5
2.	Borrowed words into Mizo from other languages	5
3.	Double adverb/adjectival adverb	5
Section		
Composition and Writing		25
1.	Idioms and phrases	10
2.	Essay writing on real life experience	8
3.	Reports of events and incidents,	7
Section		
Literature		60
Prose		20
1.	Lung in Malsawmna H. Lallungmuana	
2.	Zinkawng rapthlak zawhtute R.L. Thanmawia	
3.	Mizo tawng khawvel C. Sangzuala	
4.	Tunge Mizo Z.T. Sangkhuma	
5.	Val upa Darchhawna	
6.	Pi Puke duh loh thil James Do khusma	
7.	Thamna leh ahlutna Lalthangliana	

Poetry **20**

1. Lungdawh hia V. Hawla
2. Khuanu leng chawi Hrawva
3. Zunphur thing tin Damhauhva
4. Lenna khua hmun lo Lalzova
5. Laikhum zala ka dawn pawhim Vankhama
6. Tunah a thar hmangaihna R.L. Kamlala
7. Zo linan hla Thanga
8. Raltaing I kai VeAngRokunga

Drama **10**

Zothansangi Vanneitluanga

Fiction Chhingpuii Kaphleia 10

Prescribed books :

1. Lentlang Expert committee on Mizo language

MUSIC-536

Aims:

1. To encourage creative expression in music.
2. To develop the powers of musical appreciation.

One of the Two following syllabuses may be offered:

(A) Indian Music (Hindustani)

(B) Indian Music (Carnatic)

(A) INDIAN MUSIC (HINDUSTANI)

(May not be taken with Western Music or Carnatic Music)

CLASSES -XII

The Syllabus is divided into three parts:

Part 1 (Vocal), ***Part 2 (Instrumental)*** *and* ***Part 3 (Tabla)***. *Candidates will be required to offer one of the parts of the syllabus.*

There will be two papers: ***Paper 1 (Theory)*** *of 100 marks and* ***Paper 2 (Practical)*** *of 100 marks. Candidates will be required to appear for both the papers from one part only.*

In the Theory paper candidates will be required to attempt ***five*** *questions in all;* ***two*** *questions from Section A (General) and* ***EITHER three*** *questions from Section B (Vocal or Instrumental)* ***OR three*** *questions from Section C (Tabla).*

CLASS XII

PART I: Vocal Music

PAPER 1 (Theory)

A. Explanation and definition of the following:

1. Production, Transmission and reception of Sounds, Volume, Pitch, and Timbre.

   Relation between frequency and length of wire vis-a-vis wire tension.

2. Type of Ragas: Purva, Uttar, Sandi-Prakash, Shudha, Chhayalag, Sankirana.

3. Forms of composition: Dhrupad, Dhamar and their division in to Sathai, Antra, Alap, Tan, Meend, Andolan, Gamak, Kan.

4. Sangeet:

   (i) Two systems of Indian classical music.

   (ii) Division of twenty two shruties among seven notes.

   (iii) Formation of "That" out of Saptak.

   (iv) Classification of Ragas among "Thats".

   (v) Relationship between Vadi Swar and time of Raga.

   (vi) Time Table of Raga.

5. Laya: Drut, Vilambit and Madhya Laya.

B. Complete theory of the following Ragas with:

1. Special reference to their notes, Aroh, Avroh, Pakar Vadi, Samvadi, time etc.

   (i) Rag Asawari (ii) Rag Khamaj (iii) Rag Kafi (iv) Rag Bhairvi.

2. General Knowledge of the following Ragas:

   (i) Rag Bageshwari, (ii) Rag Malkauns

3. Notation of the following Talas in Dugun and Chaugun Laya:

   (i) Chartal (ii) Tivra Tal (iii) Zhaptal (iv) Kahrva.

4. Notation of note combinations, "Khyal" with Alap & Tan (Any Indian system of notation can be adopted).

5. Identification of Ragas by written note-combination

6. Comparison and contrast between Ragas.

7. Brief History of Indian Music.

8. Contribution of the following musicians:

   (i) Adarang, (ii) Fiyaz Khan, (iii) Bade Ghulam Ali Khan (iv) Dagar Brothers, (v) Inayat Khan, (vi) Allaudin Khan.

9. Essay of general or topical interest on music and allied subject.

PAPER 2 (Practical)

The practical work is to be assessed by the teacher and a Visiting Examiner appointed locally and approvedby the Council.

1. Demonstration of the following Ragas by singing "Khyal" with Alap, Bol alap, Sargam and Tans:

   (i) Rag Asawari (ii) Rag Khamaj (iii) Rag Kafi (iv) Rag Bhairvi.

2. Swar Vistar in the following additional Ragas:

   (i) Rag Bageshwari (ii) Rag Malkauns.

3. One "Dhrupad" in any of the Ragas in Paragraph 1.

4. Identification and production of all the twelve notes individually or jointly in small combinations with definite Matras of each.

5. Use of grace notes, Khatka, Murki, Sparsh.

6. Identification of all the Ragas by listening to their main Alaps.

7. Singing of Ten Alankars.

8. Recitation of the following Talas in Dugun and Chaugun Laya:

   (i) Chartal (ii) Jhaptal (iii) Tivra (iv) Kaharva.

9. Practice of singing self-made Alaps by quick changeover from one Raga to another in a sequence of at least two Ragas.

10. Practice of rendering Dugun, Chaugun by Swaras, numericals or syllables.

11. Practice of singing Arohi and Avrohi of ten principal scales "Thats".

PART 2: Instrumental Music

PAPER 1 (Theory)

A. Explanation and Definition of the following:

1. Production, transmission and reception of Sound, Volume, Pitch and Timbre.

   Relation between frequency and length of wire vis-a-vis wire tension.

2. Types of Ragas: Poorva, Uttar, Sandhi-Prakash, Shuddha, Chhayalag, Sankirna.

3. Meend, Andolan, Gamak, Kan.

4. Sangeet:

   (i) Two main systems.

   (ii) Division of twenty-two shruties among seven notes.

   (iii) Placement of Swaras on specific shruties.

   (iv) Formation of "That" out of Saptak.

   (v) Classification of Ragas among "Thats".

   (vi) Relationship between vadi and time of Ragas.

   (vii) Time of Ragas.

5. Laya: Drut, Madhya, Vilambit, Athgun Laya.

B. 1. Complete theory of the following Ragas with special reference to their notes, Aroh, Avroh, Pakar, Vadi, Samvadi time etc. and special emphasis on their Ansh, Challan and Nayas Swaras:

   (i) Rag Asawari (ii) Rag Khamaj (iii) Rag Bhairavi (iv) Rag Kafi.

2. General knowledge of the following Ragas:

   (i) Rag Bageshwari (ii) Rag Malkauns.

C. Notation of the following Tals in Dugun and Chaugun Laya:

(i) Chartal (ii) Tivra (iii) Zhaptal (iv) Kaharva.

D. Notation of note combination.

Gat with Alap, Tora, Jhala (Any System of notation can be adopted).

E. Identification of Ragas by written notes combination.

F. Comparison and contrast between Ragas.

G. Brief history of Indian Music.

H. Contribution of the following Musicians:

(i) Adarang (ii) Fiyaz Khan (iii) Bade Ghulam Ali Khan (iv) Dagar Brothers (v) Inayat Khan (vi) Allauddin Khan.

I. Essay of general or topical interest on music and allied subjects.

J. Explanation/Definition of the following:

Chal Achal That, Zamzama, Murki, Khatka, Krintan, Kampan.

K. Brief history and origin of musical instruments.

PAPER 2 (Practical)

The practical work is to be assessed by the teacher and a Visiting Examiner appointed locally and approvedby the Council.

1. Demonstration of the following Ragas by playing Gat with complete improvisation: Ten Toras with five types of Jhala:

   (i) Rag Asawari; (ii) Rag Khamaj; (iii) Rag Bhairvi; (iv) Rag Kafi.

2. Swar Vistar or Jod Alap in the following additional Ragas:

   (i) Rag Bageshwari (ii) Rag Malkauns.

3. One Massit khani Gat in any of the Ragas in paragraph I.

4. Identification and production of all the twelve notes individually or jointly in small combinations with definite Matras of each.

5. Use of grace notes, Khatka, Murki, Sparsh.

6. Identification of all the Ragas prescribed for Class XII by listening to their Alap.

7. Playing of ten Alankars.

8. Recitation of the following Talas in Dugun and Chaugun Laya:

   (i) Chartal; (ii) Jhaptal; (iii) Tivra; (iv) Kahrva.

9. Practice of playing self made Alap by quick change over from one Raga to another in a sequence of at least two Ragas.
10. Practice of rendering Dugun, Chaugun, Tigun, Athgun speeds by Swaras numericals or syllables.
11. Practice of playing Arohis and Avrohis of ten principal scales - "That".

PART 3: Instrumental Music-Percussion (Tabla)

PAPER 1 (Theory)

A. Contribution of the following Musicians:

(i) Adarang (ii) Fiyaz Khan

(iii) Bade Ghulam Ali Khan (iv) Dagar Brothers

(vi) Allauddin Khan

B. Essay of general or topical interest on music and allied subjects.

C. Brief history of Indian music.

D. Five Pranas of Tal and explanation thereof:

(i) Grah (Sam, Visham, Atit, Anaghat)

(ii) Jati (Chatasra, Tisra, Misra, Khand, Sankirna)

(iii) Yati

(iv) Prastar

E. Explanation of the following:

(i) Sath (ii) Tihai (Damdar/Bedam) (iii) Gat (iv) Kayada (v) Palta (vi) Rela (vii) Laggi (viii) Lari

F. Complete Tal notation of the following Tals:

(i) Jhaptal (ii) Dadra (iii) Tilwara (iv) Dhamar (vi) Jhoomra

G. Tal rotation of Kayada, Palta, etc., with clear indication of Sam, Tali, Khali, Vibhag, etc.

PAPER 2 (Practical)

The practical work is to be assessed by the teacher and a Visiting Examiner appointed locally and approvedby the Council.

A. Playing of the following Tals on Tabla in That, Dugun and Chaugun Layakaries:

(i) Jhaptal (ii) Dadra (iii) Tilwara

(iv) Dhamar (v) Jhoomra

B. Keeping the wazan of the tal intact demonstration of the following:

(i) Four Kisme in Kaharwa.

(ii) Four Kisme in Dadra.

(iii) Two Tukadas and two Kisme in Jhaptal.

(iv) One Gat, One Laggi, One Leri and one Chakkardar Tukda in Teen Tal.

C. Identification and production of syllables on Tabla.

D. Accompaniment of Tabla (only Thekas) with music played or sung.

(B) INDIAN MUSIC (CARNATIC)

(May not be taken with Western Music or Hindustani

(Music) CLASSES-XII

There will be two papers: Paper 1 (Theory) of 100 marks, Paper 2 (Practical) of 100 marks.

PAPER 1: Theory (three hours)

Candidates will be required to answer **five** questions.

1. The fundamental technical terms and their meanings (Ref. *South Indian Music, Book* 1 by P. Sambamoorthy, Chap. III, pp. 38-48).
2. Principles of Sa, re, ga, ma, notations as laid down in K.V. Srinivasa Iyengar's Music Books and in P. Sambamoorthy's "South Indian Music Series", Significance of symbols commonly used.
3. Raga classification in Carnatic Music. The scheme of the 72 Melakartas. The names of the 12 chakras. Katapayadi Formula and its application.

4. Lakshanas of the following 24 ragas:

1. Todi	2. Saveri
3. Chakravakam	4. Bhairavi
5. Anandha Bhairavi	6. Karaharapriya
7. Shri Ranjani	8. Ritigoula
9. Mukhari	10. Harikambhoji
11. Natakuranji	12. Kedaragoula
13. Sahana	14. Kambhoji
15. Yadukulakambhoji	16. Sankarabharana
17. Hamsadhwani	18. Begada
19. Atana	20. Nata
21. Purvakalyani	22. Shanmukhapriya
23. Kalyani	24. Saranga

5. Manodharma Sangita and its forms - Paddati in developing rage alpana and Kapana Svaras.
6. Dasavida gamakas (Ten gamakas).
7. The scheme of the 35 Talas. Chapu tala and its varieties. Desadi and Madyadi talas, Kriya, Anga. Laya, Gati, Matra (a detailed knowledge of two/ five pranas) shadhangas.
8. Musical forms and their association. An advanced knowledge of the following musical forms:

1. Gita	2. Tana Verma
3. Padavarna	4. Kriti
5. Ragamalika	6. Padam
7. Javali	8. Tillana

9. History of Carnatic Music with special reference to the following composers and theorists including their biographies and their contributions to Carnatic Music. 10 out of 20 must be known.
   1. Jayadeva
   2. Purandaradas
   3. Ramamatya
   4. Somanatha
   5. Narayana Tirtha
   6. Bhadrachala Ramadas
   7. Venkatamakhi
   8. Kshetrajna
   9. Paidala Guruthy Sastri
   10. Tyagaraja
   11. Muthuswami Dikshitar
   12. Syama Sastri
   13. Arunachalam Kavirayar
   14. Gopalakrishna Gharat
   15. Svati Tirunal
   16. Subbaraya Shastri
   17. Veena Kuppayyar
   18. Mysore Sadasiva Rao
   19. Patnam Subramanya Iyar
   20. Pallavi Seshayyar
10. Classification of musical instruments into stringed, wind and percussion group. A general knowledge of the structure of the vina, violin tampuro, gottuvadyam and flute. Tuning of thehuman voice and the compass of the concert instruments of South India.
11. Musical sound and voice. Pitch. Intensity and timbre. Sympathetic vibration. Resonance. Echoes, Musical intervals. Modal shift of tonic. (Grahabhedam).

PAPER 2: (Practical - about 20 minutes)

The practical work (in Class XII), is to be assessed by the teacher and a Visiting Examiner appointed locally and approved by the Council.

Two padas of Kshetrajna. One Ragamalika. Two Tillanas. Two Javalis and the following compositions:

1. Todi	Kaddanna Variki
2. Saveri	Sankari Sankuru
3. Chakravakam	Etula Brotuvo
4. Bhairavi	Neepadamule
5. Anandha Bhairavi	Nimadi Challaga
6. Karaharapriya	Pakkala Nilabadi
7. Sri Ranjani	Marubalka

8.	Harikambhoji	Entharanidaya
9.	Natakuranji	Manasuvishaya nata
10.	Shana	Rama Ikananu
11.	Kambhoji	Koniyadina napai
12.	Sankarabharana	Saroja dala netri
13.	Hamsadhwani	Vatapi ganapatim
14.	Begada	Nadopasana
15.	Atana	Ilalo pranatharthi hara
16.	Purvi Kalyani	Ninnu Vina gamari
17.	Shanmukhapriya	Mariveredikkevaraiya rama
18.	Kalyani	Ninnu Vina gati
19.	Saranga	Neevada negana

Note: Candidates shall have the option of singing or playing these pieces or other classical pieces of an equal standard.

Candidates shall be expected to know in outline the meaning of at least six songs of the classical composers learnt by them.

2. Alapana of the following ragas

1. Todi	2. Saveri
3. Bhairavi	4. Anandha Bhairavi
5. Mohana	6. Kedaragoula
7. Kambhoji	8. Yadukula Kambhoji
9. Sankarabharana	10. Begada
11. Kalyani	

3. Ability

(i) to sing Kalpada swara for the songs learnt in Todi, Bhairavi, Kambhoji, Sankarabharana and Kalyani ragas and in Adi and Rupaka talas;

(ii) to sing or play a given musical passage in sa, re, ga, ma notation in any of the prescribed 24 ragas.

(iii) to give swaras for musical phrases sung or played;

(iv) to recognise ragas from alpanas heard or played; and

(v) to recognise the talas of unfamiliar songs heard or played.

4. In addition to the individual tests there will also be common ear tests, sight-singing tests and musical dictation at the practical examination.

In the practical examination, candidates may offer vocal music or one of the following:

Vina, Gottuvadyam, Violin, Balakokil, Flute or Nagasvaram. A vocal candidate shall sing to the sruti accompaniment of Tambura. A vocal candidate may sing playing the Tambura himself/herself or he/she may utilise the services of another person to provide the Tambura accompaniment for him/her, provided this other person is not a candidate for this same examination.

ORIYA

(Code No. 513)

CLASS XII

BRIEF

One Paper : **Time : 1 hour** **Marks : l00**

Unitwise Allocation

Unit/Areas of Learning		Marks
1.	Reading Skills	10
2.	Writing Skills	25
3.	Applied Grammar, Prosody and Rhetorics	15
4.	Literature	50

LANGUAGE **Marks**

Section A : Reading Skills **10**

Unseen Passage for Reading/Comprehension followed by 4 to 5 questions. 1 mark may be allocated for suitable heading. 10

Section B : Writing Skills **25**

1. Essay on Current topics (Social and Cultural issues)
2. Letter to the Editor of Newspaper
3. Factual description of place or object

Section C : Applied Grammar, Prosody and Rhetorics **15**

(i) Applied Grammar 09

1. Transformation of sentences (Simple, Complex, Compound) 03
2. Idioms and Proverbs 03
3. Correction of errors in words 03

(ii) Prosody and Rhetorics 06

1. Prosody (Sama, Bisama, Matra bruta)
2. Rhetorics (Anuprasa, Rupak)

Section D : Literature **50**

Prose : Prescribed Text : Gadya Dhara, Orissa State Bureau of 20
Text Book preparation and Production, Bhubaneswar, 2006

1.	Swadhina Chinta	Biswanath Kar
2.	Odia Jati Kie	Gopabandhu Das
3.	Kshyama	Mayadhar Mansingh
4.	Manisa (2)	Bhubaneswar Behera
5.	Jatira Jibana O Samskruti	Golak Bihari Dhal
6.	Madhu Sandhan	Chandra Sekhar Rath

Marks **20**

Poetry : Prescribed text : Padya Dhara, Orissa State Bureau of Text Book 2020
Preparation and Production,
Bhubaneswar, 2006
Enu Kapota
Guru Moro - Jagannath Das
Jagate Kebala - Baladev Rath
Mo Jibana Pachhe Narke Padithau
- Bhima Bhoi Mu Hata Bahuda
- Fakir Mohan Senapati
Barsa - Radhanath Roy
Utkala Kamala
- Godabarisha Mohapatra
Chhota Mora Ganti - Sachidananda Routroy
Grama Patha - Binod Chandra Nayak
Sarata Rutura Janma - Guru Prasad Mohanty

Marks **20**

Drama : Buxi Jagabandhu by Manoranjan Das, Dasarathi Pustakalya, Cuttack-2

Marks **10**

PHYSICAL EDUCATION

(Cade No. 540)

Max.Marks.100 **Time: 40 Minutes**

Theory: 60 Marks

Practical: 40 Marks (External : 25, Internal : 15)

THEORY

Unit 1. PHYSICAL FITNESS **05 Marks**

- Meaning and importance of Physical fitness.
- Components and types of Physical fitness.
- Factors effecting physical fitness.

Unit II. TRAINING METHODS **10 Marks**

- Meaning and concept of training.
- Methods of training: Isometric and ISO- kinetic Exercise, Continuous Method, Interval Training and Fertlek, Circuit training, Acceleration Runs and Pace Races.

Unit III. SOCIOLOGICAL ASPECTS OF PHYSICAL EDUCATION **10 Marks**

- Meaning of Sociology and its Importance in Physical Education and Sports.
- Games and Sports as man's cultural heritage.
- Development of leadership qualities and group dynamics through physical Education.
- Value Education through physical Education programmes.

Unit IV. MORAL EDUCATION **05 Marks**

- Need and Importance of Moral Education.
- Moral Education through Physical Education.

Unit V. SPORTS AND ENVIRONMENT **10 Marks**

- Concept of environment.
- Need of environment in physical education programme.
- Role of individual in improvement of environment for health promotion and prevention of sports related accidents.

Unit VI. YOGA **05 Marks**

- Meaning and importance of yoga.
- Yoga and Indian heritage.
- Elements of yoga.

Unit VII. CONCEPT OF MAJOR GAMES/SPORTS **10 Marks**

- Cricket, Athletics, Basketball and Table Tennis.
- History of games (Above Games)
- Rules, measurement of the field/court. (Above Games)

Unit VIII. SPORTS MEDICINE FIRST AID REHABILITATION **05 Marks**

- Meaning and Importance of Sports Medicine.
- Doping (meaning, and drugs for doping)
- First Aid and Rehabilitation of the following sports injuries:
  - Acute injuries: such as dehydration, heat stroke, and exercise-induced asthma.
  - Chronic injuries: such as aches and pain of unknown origin, tendinitis (swelling in the tendons), and stress fractures (hairline fractures of the bone due to overuse).

PRACTICAL: **40 marks**

Internal assessment: **15 Marks**

Internal assessment shall comprise Games/ sports (kho-kho, badminton, shot put) and Project work. The break up of the marks is as under;

1. Games / sports (kho-kho, badminton, shot put). 10 Marks
2. Trekking. 05 Marks

External assessment: **25 Marks**

External assessment shall comprise skill test of Games/ sports (any game/ sport of student's choice) and Record file (the students shall maintain the practical file by drawing the field/ court with measurement and rules of the games/sports. The break up of the marks is as under;

1. Skill test of Games/sports. (students choice game) 15 Marks
2. Record file. 05 Marks
3. Vivo-voce. 05 Marks

Sr. Secondary Course (Syllabus)

Physics

RATIONAL

Physical is a fundamental science because it deals with such basic feature of the world as time, space, motion matte, electricity, light and radiations. Every event that occurs in the natural world has some feature that can be viewed in these terms. Study of Physics need not necessarily be taken as means of becoming a physicist; it is a means of rationally understanding nature. Physics lies behind all technological advancement such as computer, internet, lunching of rockets and satellites, radios and TV communications, lasers, etc. It also finds applications in such simple activities of men as lifting a heavy weight or makinga long jump. Physics is thus an all-pervading science and its study helps us in finding answers to questions like why and how?

In order to bring out various aspects of Physics as a fundamental science the content of the present syllabus has been so chosen as to relate with the study of natural physical phenomenon. The underlying physical laws and principles of such phenomena and their effects on daily life have been reflected in the syllabus. Themes like motion, properties of matter, energies like heat, light and electricity and electronics with would be of interest to all and specially to those who are interested in pursuing Physics as a career have been selected to from our content. The syllabus also includes such emerging areas as electronics, nuclear physics, astrophysics, medical physics and photography, which find immense applications in daily life.

Though mathematics is basic to the understanding of most of the problems of physics, in the present course stress has been given to avoid rigour or mathematics like integration and differentiation. The focus has been to teach concepts of physics rather than mathematics calculation.

This course attempts.

(i) acquire knowledge and develop understanding of concepts, fundamental laws, principles and processes in the area of physics so that relationship between cause and effects of physical phenomenon can be understood;

(ii) appreciate the contributions of physics towards improving quality of lice;

(iii) promote interest in physics and foster a spirit of enquiry; and

(iv) improve competencies of individuals in work skills required in their procession.

As a part of this process, the course also aims at developing the following abilities in the learner:

- experimental skills (like taking observations, manipulation of equipment) and communicative skills such as reporting of observations and experimental result;
- problems solving ability e.g. analyzing a situation or data, establishing relationship between cause and effects:

- scientific temper of mind by making judgment on verified facts and not opinions, by showing willingness to accept new ideas and discoveries: and
- awareness of the dangers inherent in the possible misuse of scientific knowledge.

Structure of the Syllabus

The syllabus in physics includes two parts-core modules and optional modules. The core modules comprises of the essential concepts and phenomenon of physics, which a student at this level should know. It has eight core modules, which contain predominantly the subject matter of mechanics, electricity, light and other areas of physics representing the minimum knowledge required to progress into the more advanced areas and to develop appreciation for the fact that physics plays a significant role in most situations. The optional modules are on the specific fields and have four modules one each on Astrophysics, Electronics, Photography and Audio-Videography and Medical physics. In the optional modules there is a choice to opt any one of the given four modules.

(A) CORE MODULES

Modules	**Marks**	**Min. Study Time**
1. Motion, force and Energy	14	45
2. Properties of Matter	08	25
3. Heat and Thermodynamics	06	20
4. Electricity and Magnetism	14	45
5. Oscillations and Waves	06	20
6. Optics and Optical Instruments	08	25
7. Atoms and Nuclei	07	25
8. Semiconductors and their Applications	07	20
Total	**70**	**225 hours**

(B) OPTIONAL MODULES (One Module – 10 Marks Each and 30 hrs.)

Modules	**Marks**	**Min. Study Time**
1. Astrophysics	10	30
2. Electronics	10	30
3. Photography and Audio-Videography	10	30
4. Physics in Medical Sciences	10	30

The details of Curriculum is given below:

CORE MODULES

MODULE 1: MOTION, FORCE AND ENERGY

Unit 1: Dimensional Analysis and Vectors

(i) Units

(ii) Dimensions

(iii) Dimensional formula

(iv) Application of dimensional equations

(v) Vectors and their representation (graphically)

(vi) Resolution of vectors in to rectangular components (two dimensions)

(vii) Addition and subtraction of vectors

Unit 2: Motion in a Straight Line

(i) Distance and displacement,

(ii) Speed and Velocity with special reference to average and relative velocity

(iii) Instantaneous velocity

(iv) Uniform motion with examples.

(v) Non-uniform motion (constant acceleration) with examples.

(vi) Graphical representation of motion in two dimensions (including that of constant acceleration)

(vii) Equations of Motion with numerical problems.

Unit 3: Newton's Laws of Motion

(i) Concept of force and inertia

(ii) First law of motion with examples

(iii) Second law of motion with concept of momentum and force.

(iv) Third law of motion with examples.

(v) Free body diagram.

(vi) Conservation of linear momentum

(vii) Friction and lubrication

Unit 4: Motion in a Plane

(i) Projectile motion (equation, time of fight, rang, and maximum height)

(ii) Uniform circular motion (radial and tangential acceleration)

(iii) Centripetal acceleration

(iv) Application of circular motion

(v) Uniformly rotating frame of reference and non-inertial force (centrifugal force)

(vi) Relation between velocity and angular velocity

Unit 5: Gravitational motion

(i) Newton's universal law of gravitation.

(ii) Inertial mass and gravitational mass.

(iii) Acceleration due to gravity and its variation.

(iv) Kepler's laws.

(v) Motion of planets, orbital and escape velocity.

(vi) Satellites – geostationary, weightlessness.

Unit 6: Work, Energy and Power

(i) Work done by a constant force.

(ii) Work done by a carrying force (graphical method) with example of spring.

(iii) Work-energy relation

(iv) Conservative and non-conservative force.

(v) Mechanical energy (kinetic and potential) with examples.

(vi) Conservation of energy, (spring, pendulum, etc.)

(vii) Elastic and inelastic collision

(viii) Power and its units.

Unit 7: Rotational Motion

(i) Rigid body motion, center of mass, couple and Torque.

(ii) Moment of inertia, radius of gyration and its significance.

(iii) Theorems of Motion for a uniformly rotating rigid body (no derivation)

(iv) Angular momentum and its conservation with simple application.

(v) Rotational and translational motions with example (motion of ball, cylinder, flywheel on an inclined plane.

MODULE 2: MECHANICAL PROPERTIES OF MATTER

Unit 1: Properties of solids

(i) Elastic properties and hook's law.

(ii) Young's modules, Bulk modulus, modulus of rigidity and compressibility.

(iii) Applications of elasticity-cantilever, girder etc.

Unit 2: Properties of Liquids

(i) Hydrostatic pressure and buoyancy.

(ii) Pascal's law and its application

(iii) Forces of Cohesion and adhesion

(iv) Surface energy and surface Tension.

(v) Angle of contact and capillary action.

(vi) Application of surface tension, liquid drops, bubbles and detergents

(vii) Types of liquid flow-laminar and turbulent, Reynolds number,

(viii) Viscosity and Stoke's law.

(ix) Bernoulli's Theorem (no derivation) and its applications.

Unit 3: Properties of Gases

(i) Kinetic theory of gases (with derivation of ideal gas equation state)

(ii) K. E. and temperature relationship

(iii) Specific heat of gases, equilibrium of heat.

(iv) Specific heats C_p and C_v and their relationship.

MODULE 3: HEAT AND THERMODYNAMICS

Unit 1: Laws of thermodynamics

(i) Thermodynamic variables, concept of hear, and thermodynamic equilibrium.

(ii) Temperature and its measurement.

(iii) Principle of Calorimetery.

(iv) Thermodynamic processes – isothermal, adiabatic, reversible, irreversible and cyclic process

(v) First law of thermodynamics – internal energy

(vi) Second change, phase diagram, latent heat, triple point, and concept of entropy and its significance.

(vii) Carnot's Cycle and its Efficiency.

Unit 2: Transfer of Heat

Conduction of Heat

Convection of Heat

Radiation of Heat

Black Body Radiation

Wien's Law

Stefan's Law

Green House Effect

(viii) Newton's Law of Cooling.

MODULE 4: ELECTRICITY AND MAGNETISM

Unit 1: Electrostatics

(i) Properties of electric charge-quantizations & conservation.

(ii) Coulomb's law (vector form)

(iii) Electric field and field or point charge (through diagram)

(iv) Force in and charged particle in electric field.

(v) Electric field of a dipole and dipole moment

(vi) Behavior of electric dipole in uniform electric field.

(vii) Electric Potential due to appoint charge, due to a dipole and potential energy.

(viii) Relation between electric field and potential

(ix) Statement and use of Gauss theorem Determining electric field of a point charge, ling wire, plane sheet, solid sphere, spherical shell.

(x) Conductors, and field inside conductor, electrostatic shielding.

(xi) Capacitors and their combinations

(xii) Dielectric and their polarization

(xiii) Electric field in dielectric, capacitor with dielectric.

Unit 2: Electric Current

(i) Electric current in a conductor

(ii) Ohm's law, Resistivity of material and Colour coding of resistors.

(iii) Combination of resistances (series and parallel)

(iv) Kirchoff's laws and their application to electrical circuits

(v) Wheatstone bridge principle

(vi) Potentiometer and its application

Unit 3: Chemical and Thermal Effects of Electric Current

(i) Heating effect of electric current, joules law of heating

(ii) Electrolysis – Faraday's laws of electrolysis and their application

(iii) Thermoelectricity (Seabeck, peltier and Thomson effect (only qualitative)

Unit 4: Magnetic Effect of Electric Current

(i) Magnetic effect of electric current

(ii) Bio-Savart law – Magnetic field at the center of a coil carrying current (qualitative treatment)

(iii) Amprere's circuital law and its application in finding magnetic field of a wire loop (at a center), toroid and solenoid.

(iv) Force on a current carrying wire in a uniform magnetic field and definition of ampere.

(v) Force on a charged particle in a magnetic field and Lorentz force.

(vi) Magnetic dipole moment of a current loop

(vii) Torque on a current loop in magnetic field.

(viii) Moving coil Galvanometer and its conversion into ammeter and voltmeter.

Unit 5: Magnetism

(i) Magnet and magnetic field

(ii) Components of Earth's magnetic field

(iii) Molecular theory of magnetism (qualitatively)

(iv) Dia, para and Ferro magnetic materials

Unit 6: Electromagnetic Induction and Alternating Current

(i) Faraday's law of electro-magnetic induction

(ii) Lenz's law

(iii) Self and mutual induction

(iv) Growth and decay of current in L. R and CR circuits (qualitative)

(v) Alternating current and voltage, illustrating with phase diagram – Peak and RMS values.

(vi) Circuits containing only R. L or C separately, their phase relationship between I &V

(vii) Power in AC circuit – Power factor and watts current (pure inductor and Pure capacitor)

(viii) LCR series combination (using phaser diagram only) and resonance

Unit 7: Electric Power Generation and its Transmission

(i) Generators – AC and DC

(ii) Transformers

(iii) Transmission of power (domestic and industrial distribution)

(iv) Various energy sources, electrical power generation – hydro-electricity, chemical energy, molecular energy, wind energy and solar energy.

(v) Status of Electric power in India.

(vi) Problem of low voltage and load shedding.

MODULE 5: OSCILLATIONS AND WAVES

Unit 1: Simple Harmonic Motion

(i) Periodic motion – amplitude, period frequency and phase

(ii) Simple Harmonic Motion as a projection of uniform circular motion with examples of spring and simple pendulum.

(iii) Forced oscillations – resonance with examples.

(iv) Damped oscillations with example (without mathematics)

Unit 2: Elastic Waves

(i) Moving pulse, harmonic waves, wavelength, frequency, speed and their relationship, amplitude of wave

(ii) Wave motion in taut string, formula for its speed.

(iii) Wave motion in gaseous medium and formula for its speed.

(iv) Phase difference between two harmonic waves.

(v) Superposition of waves – interference of waves, reflection of waves from rigid boundary, standing waves and beast (only qualitative treatment, with equation)

(vi) Characteristics of sound waves.

(vii) Threshold of hearing, intensity of sound and its unit.

(viii) Shock waves, noise pollution.

(ix) Resonance column (overtones and harmonics) only through diagram

(x) Doppler's effect and its application.

MODULE 6: OPTICS AND OPTICAL INSTRUMENTS

Unit 1: Reflection and Refraction of Light

(i) Reflection of light from spherical mirrors, sign convention.

(ii) Mirror formulae and problems based on it

(iii) Reflection of light, Snell's law of refraction

(iv) Total Internal Reflection and its application.

(v) Refraction through single curved surface and lenses.

(vi) Lens maker's formula and magnification

(vii) Power of lens.

(viii) Combination of lenses.

Unit 2: Dispersion and Scattering of Light

(i) Dispersion of light through prism

(ii) Spectrometer and its uses

(iii) Spherical and chromatic aberration.

(iv) Scattering of light in atmosphere

(v) Rainbow

Unit 3: Electromagnetic waves

(i) Maxwell's theory of em-waves.

(ii) Properties of em-waves

(iii) Em-waves spectra

(iv) Em-waves propagation and their application

Unit 4: Wave Properties of Light

(i) Nature of light

(ii) Light as wave

(iii) Huygen's wave theory and wave propagation – reflection and refraction

(iv) Interference – Young's double slit experiment

(v) Diffraction of light (qualitative)

(vi) Polarization, polarization by reflection and its application in daily life

Unit 5: Optical instruments

(i) Compound microscope and its magnifying power

(ii) Telescope – astronomical (Newton's reflector) and terrestrial

(iii) Resolving power in terms of Rayleigh's criteria

(iv) Resolving power of eye, telescope and microscope

MODULE 7: ATOMS AN NUCLEI

Unit 1: Structure of Atom

(i) Alpha –particle scattering and Rutherford's atomic model

(ii) Bohr's atomic model, energy levels in electron volts

(iii) Hydrogen Spectrum

Unit 2: Photoelectric Effect and Mater Waves

(i) Emission of electrons

(ii) Photoelectric effect and its explanation

(iii) Photocell and its applications

(iv) Wave nature of matter, de-Broglie Waves – Davission and Germer Experiment

Unit 3: Nuclei and Radio - Activities

(i) Atomic mass unit, mass number, size of nucleus

(ii) Isotopes and neutrons

(iii) Mass-energy equivalence (MeV)

(iv) Mass defect and binding – energy curve

(v) Radio activity - á, â decay and ã emission

(vi) Half life and decay constant of nuclei

(vii) Application of radioactivity in carbon dating, medical and agriculture.

Unit 4: Nuclear Fission and Fusion

(i) Fission reaction
(ii) Fusion reaction
(iii) Energy in stars
(iv) Nuclear reactor
(v) Peaceful and destructive application of Nuclear Energy.
(i) Nuclear Pollution

MODULE 8: SEMICONDUCTORS AND THEIR APPLICATIONS

Unit 1: Basics of Semiconductors

(i) Energy bands in solids
(ii) Conductors, insulators, and semiconductors (on the basis of electrical conductivity)
(iii) Charge carries in semiconductors-Holes and electrons
(iv) Electrical conductivity of semiconductors
(v) Intrinsic and extrinsic semiconductors
(vi) P-type and n-type semiconductors.

Unit 2: Semiconductor Devices

(i) Pn – junction diode
(ii) Characteristic of pn-j unction diode
(iii) Types of diode
(iv) Transistor – *pup* and *npn*
(v) Characteristic curves of transistor

Unit 3: Applications of semiconductor Device

(i) Pn-j unction diode as a rectifier
(ii) Transistor as an amplifier (common emitter)
(iii) Transistor as a switching device
(iv) Logic gates and their realization (OR, AND, NOT, NAND, NOR)

OPTIONAL MODULE 1: ASTRO PHYSICS.

Unit 1: The Sun and the Solar Family

(i) The Sun – introduction

(ii) Interesting phenomenon on solar atmosphere – corona.

(iii) Magnetic field in the solar system

(iv) Sunspot cycle, granulation on solar surface, solar flares, prominence

(v) Planets and their characteristics.

(vi) Comets, meteors, meteoroids and asteroids

(vii) Evaluation of solar system

Unit 2: Astronomical Telescopes

(i) Windows in electro – magnetic spectrum

(ii) Principle and use of refraction and reflecting telescope

(iii) Newtonian and Cassegrainian telescopes- their principles and uses

(iv) X-ray telescope and radio – telescope

(v) Spherical aberration

(vi) Rayleigh's criterion

Unit 3: Stars

(i) Measuring distances and masses of stars

(ii) Brightness of stars

(iii) Surface temperature of Stars

(iv) Stellar spectra, stellar classification

(v) H. R. diagram

(vi) Evaluation of stars – different theories

Unit 4: Universe

(i) Our galaxy

(ii) Interstellar gas clouds

(iii) Structure of the galaxy, central bulge, disc of the galaxy

(iv) Halo and corona

(v) External galaxies

(vi) The expanding universe

(vii) Origin of the universe, evolving universe, steady state universe, cosmic back – ground radiation, open or closed universe

MODULES 2: ELECTRONICS IN DAILY

LIFE Unit 1: Measuring Instruments in

Electronics

Unit 2: Power Supply and Signal Generating Systems

(i) Multimeter principle and its uses.

(ii) C R O and its uses for measurement of voltage, frequency and wave form.

(iii) Transducers and their application

(iv) Display Device –L E D, L E D and their uses

(i) Solar cells and their uses

(ii) Frequency generator, power supply inverters, emergency light

(iii) Zener diode as a voltage regulator

Unit 3: Microprocessor and its Applications

(i) Microprocessor – architecture and functional blocks

(ii) Instructions – data transfer, control and branch, and input – output

(iii) Uses of microprocessor in household devices

Unit 4: Circuit Breaker, Timer and Power Control

(i) Electronic circuit breaker

(ii) Timers, M C B power control.

(iii) Calculator and Electronic watches –principle and operations

OPTIONAL MODULES 3: PHOTOGRAPHY AND VIDEO –AUDIOGRAPHY

Unit 1: PHOTOGRAPHY – CAMERA

(i) Camera – an introduction, part of a camera, camera eye (lens), shutters, special lens

(ii) Types of camera – their basic principle, constructions and working

(iii) Principle of video camera

(iv) Choosing a camera, picture size.

(v) Choice of lens – angle of view and resolving power, aperture and focusing.

Unit 2: Film Exposing and Processing

(i) Films (storture), types of films

(ii) Film exposure, aperture and speed relationship, use of exposure meter

(iii) Developing the exposed film, developers, ingredients and their functions, preparation of developers, types of developers B & W whored.

Preservation of developers, methods, field of developments, tray method tank method, precautions during film development

(v) Film fixing, fixing, washing and drying of film.

Unit 3: Audio – Video Recording

(i) Basic principle of recording (Inter-conversion)

(ii) Methods of conversion of video signal into electrical signals.

(iii) Methods of conversion of audio signal into electrical signals

(iv) Storage of audio – video signals on tapes

(v) Quality of recording, sound recording on cine films

Unit 2: Power Supply and Signal Generating Systems

(vi) Tape characteristics, structure and composition, tape format, tape speeds, important tape parameters

(vii) Preservation of tapes, storage techniques, precaution

(viii) Over recording, need for over recording various methods of over – recording, protection of over–recording.

Unit 4: Compact Disc For Audio – Video Recording

(i) Compact disc – limitation of traditional audio recording system, lamination video recording system.

(ii) Need for compact disc, advantages of compact disc.

(iii) C D for audio recording.

(iv) Basic principle of audio recording.

(v) Construction of CD for audio.

(vi) Methods of CD – audio –recording.

(vii) Care and cautions.

(viii) CD for video –recording, construction of CD for video.

(ix) Basic principle for video recording.

(x) Methods of CD – video recording.

(xi) General operating and installation

(xii) precautions.CD – players,operating principle.

(xiii) Quality of reproduction.

PHYSICS CURRICULUM FOR PRACTICAL WORK

The knowledge of physical concepts and generalization that is gained mainly throughtheory gets crystallized with the help of practical work undertaken by a learner. It leads to better understanding through first hand experience and reinforcement. The practical work acts as an aid to instruction. It science and facilitate the development of the physco-motor skills.

The skills which this course on practicals aims to develop are:

(i) Observing skills, which include, proper use of measuring instruments and apparatus.

(ii) Manipulative skills, which include selection of appropriate equipment, setting it up, performing experiments with reasonable speed, accuracy and neatness.

(iii) Reporting skills which include presenting the observations sin an appropriate manner / sequence, calculating the result accurately and interpreting data and drawing conclusion.

The syllabus in practical physics has been developed in consonance with the theory part of the physics syllabus so that the learner can understand better the knowledge gained in

theory. In order to expose the learner to different areas of physics, the practicals are grouped into three sections A, B and C. A learner is required to perform 18 experiments in all, selecting six from each section given below:

LIST OF PRACTICALS

Group A – Perform Any Six

1. Determine the internal diameter and depth of a cylindrical container (like tin can, calorimeter) using a vernier calipers and find its capacity. Verify the result using a graduated cylinder.

2. Determine the diameter of a given wire using a screw gauge and its length with the help of meter scale. Determine mass of the wire using a physical balance and calculate the density of the material of the wire in kg. /$m^{3.}$

3. Determine the radius of curvature of a concave mirror using a spherometer. Verify the result by parallax method using one needle.

4. Find the time period of a simple pendulum for small amplitudes and draw the graph of length of the pendulum against square of the time period. Use the graph to find the length of the second's pendulum.

OR

Find the time period of a simple pendulum of different amplitudes up to about 60_o) and draw a graph between the time period and amplitude of the simple pendulum for a given length.

5. Find the weight of a given body using law of parallelogram of vectors and verify by spring balance.

6. Study the Newton's law of cooling by plotting a graph between cooling time and temperature different between calorimeter and surroundings.

7. Determine the specific heat of a solid using the methods of mixtures.

OR

Determine the specific heat of a solid using the method of mixture.

8. Find the spring constant of a helical spring by measuring its extension by a known load. Then to find acceleration due to gravity by measuring time period of vertical oscillations of a known loan.

9. Find the required to empty a burette, filled with water, to ½ of its volume, to ¼ of its volume, to 1/8 of its volume a so on. Plot a graph between volume of water in the burette and time and thus study at each stage, that the fractional rate of flow is the same (analogy to radio – active decay)

10. Determine the radius of gyration about the center of gravity of a meter scale used as bar pendulum by studying its oscillations about axes close to its C. G.

Group B: Perform Any Six

1. Determine – (i) in an air column the wavelength of sound produced, (ii) the velocity of sound in air at room temperature using a resonance column and tuning fork.
2. Compare the frequencies of two tuning forks by finding first and second resonance positions in a resonance tube.
3. Establish graphically the relation between the tension and length of a string of sonometer vibrating in its fundamental mode resonating with a given tuning fork. Use the graph to determine the mass per unit length of the string.
4. Find the volume of v for different volume of u in case of a concave mirror and find its focal length (f) by plotting graph between $(1/u)$ and $(1/v)$.
5. Find the focal length (f) of convex lens by plotting graph between $1/u$ and $1/v$.
6. Find the focal length of a convex mirror using a convex lens.
7. Determine the focal length of concave lens by combining it with a suitable convex lens.
8. Draw a graph between the angle of incidence (i) angle of deviation (D) for a glass prism. Determine the refractive index of the glass of the prism using this graph.
9. Compare the refractive indices of two transparent liquids using a concave mirror and a single pin.
10. Set up an astronomical telescope and find its magnifying power.

Group C – Perform Any Six

1. Verify law of combination (series and parallel) of resistances using ammeter – voltmeter method and coils of known resistances.
2. Compare the e. m. f's of two given primary cells using a potentiometer.
3. Determine the specific resistance of two material of the given wire using ameter bridge.
4. Determine the internal resistance of a cell using a potentiometer
5. Determine the inductance and resistance of a given coil using suitable series resistance and A. C. voltmeter.
6. Study decay of current in R. C. circuit using a galvanometer and find thetime constant of the circuits.
7. Draw the characteristic curve in forward biased $p\,n$ junction diode and to determine the static and dynamic resistance of the given diode.
8. Study the characteristic of a, an $n\,p\,n$ transistor in common emitter mode andto find out the values of current and voltage gains.
9. Draw lines of force due to a bar magnet keeping

(i) North pole pointing north

(ii) North pole pointing south

Locate the neutral point.

10. Determine the internal resistance of a moving coil galvanometer by half deflection method. Convert the galvanometer into a voltmeter of suitable range and verify it.

SCHEME OF PRACTICAL EXAMINATION

Duration: 3 hours

There will be a practical examination of 20 marks apart from the theory examination.

The distribution of 20 marks is as follows:

Viva : 3 Marks

Record Book : 3 Marks

Two Experiments : 14 Marks (7 Marks each)

(Theory should not be from the same group)

POLITICAL SCIENCE

CURRICULUM FOR SENIOR SECONDARY

MODULE 1: INDIVIDUAL, STATE AND THE GLOBAL ORDER

- Sphere of Politics: Power and Authority Freedom and Justice
- Nation, State and the Government
- The Nation-State and Globalisation of Politics.

MODULE 2: ASPECTS OF THE CONSTITUTION OF INDIA

- The Making of the Constitution: The Preamble
- Salient Features of the Indian Constitution
- Fundamental Rights
- Directive Principles of State Policy and Fundamental Duties
- Federalism and Centre-State Relation
- Emergency Provisions
- Students Assignments

MODULE 3: ORGANS OF GOVERNMENT: CENTRE ANS STATE LEVELS

- The President and Governors
  The Council of Ministers:
- The Prime Minister and The Chief Minister
- The Parliament of India
- The State Legislature
- Structure and Jurisdiction of Indian Judiciary
- Judicial Review and Protection of Fundamental Rights
- Judicial Activism

MODULE 4: DEMOCRACY AT WORK

- Universal Adult Franchise
- Political Parties and Pressure Groups
- Role of Socio-Political Movements

MODULE 5: ORGANISATION OF THE GOVERNMENT

- Administrative System: Centre, State and District Level

- Parliamentary Control: The Parliamentary Committees
- Comptroller and Auditor General
- Public Grievances and Redressal Machinery
  Students Assignments
  Political Science Curriculum

MODULE 6: DEMOCRATIC DECENTRALISATION

- Urban Local Bodies
- Panchayati Raj Institutions
- Non-Government Organisations

MODULE 7: CONTEMPORARY POLITICAL CONCERNS

- Communalism and Regionalism
- Environmental Degradation
- Population Growth and Demographic Change
  The policy of economic liberalization if India
  Students Assignments-4

MODULE 8: WORLD POLITICS AND INDIA

- Post Cold War global Order
- The United Nations
- Some International Agencies
- Aspect of India's Foreign Policy
- Students Assignemnt-5
- Sample Question Papers

OPTIONAL

MODULE 1: SOME EMERGING ISSUES OF INDIAN POLITICS

- Case in Indian Politics Reservations
- Political violence
- Role of Media
- Students Assignment

MODULE 2: FREEDOM STRUGGLE AND CONSTITUTIONAL DEVELOPMENT IN INDIA

- Colonialism in India
- Freedom Struggle in India
- Landmarks in Constitutional Development

POLITICAL SCIENCE

CURRICULUM FOR SENIOR SECONDARY

MODULE 1: INDIVIDUAL, STATE AND THE GLOBAL ORDER

- Sphere of Politics: Power and Authority Freedom and Justice
- Nation, State and the Government
- The Nation-State and Globalisation of Politics.

MODULE 2: ASPECTS OF THE CONSTITUTION OF INDIA

- The Making of the Constitution: The Preamble
- Salient Features of the Indian Constitution
- Fundamental Rights
- Directive Principles of State Policy and Fundamental Duties
- Federalism and Centre-State Relation
- Emergency Provisions
- Students Assignments

MODULE 3: ORGANS OF GOVERNMENT: CENTRE ANS STATE LEVELS

- The President and Governors
  The Council of Ministers:
- The Prime Minister and The Chief Minister
- The Parliament of India
- The State Legislature
- Structure and Jurisdiction of Indian Judiciary
- Judicial Review and Protection of Fundamental Rights
- Judicial Activism

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- Freedom Struggle in India
- Landmarks in Constitutional Development

Sr. Secondary Course (Syllabus)

PSYCHOLOGY

1. RATIONALE

Psychology is relevant to all walks of life. Everyone learns some psychology, if not in school, through one's own experience and uses it without realizing it consciously. Prominent applications in psychology include areas of human development and adjustment, development of skills, communication, education, social change, stress etc. As mentioned earlier, psychology extends to all areas of human existence.

While imparting knowledge of the above to a student of Senior Secondary, it is our endeavor to acquaint him/her with his/her own life concerns and bring home on how psychology has bearing in such issues. It will also be important that while discussing modern psychological thought and research, the indigenous ideas are integrated into a collective perspective.

2. OBJECTIVES

- To make students understand the major areas of life concern (e.g. development, education., work, hearth, society etc.)
- To make students understand the relationship between the life concern and psychological perspective.
- To make student apply the knowledge of psychology in the solution of problems related to individual life concerns.
- To make students apply the knowledge to psychology for personal and social development.

3. DISTRIBUTION OF MARKS

Module	Marks
Foundations of behaviour – I	18
Foundations of behaviour – II	18
Human Development	18
Personally	18
Group Process	18
Work & Stress	10
Total	**100**

4. COURSE DESCROPTION:

4.1 FOUNDATIONS OF BEHAVIOUR – I

1) Psychology: an introduction.
2) Methods in Psychology
3) Biological Bases of behaviour
4) Sensory Processes
5) Perception and attention

4.2 FOUNDATION OF BEHAVIOUR – II

(1) Learning
(2) Memory and Forgetting
(3) Thinking
(4) Individual differences
(5) Motivation
(6) Emotion

4.3 HUMAN DEVELOPMENT

1. Nature of Development.
2. Stages of Development.
3. Factors of Development
4. Adolescence
5. Adulthood to Personality

4.4 PERSONALITY

(1) Nature of Personality
(2) Approaches to Personality
(3) Adjustment
(4) Self-control and Moral Development
(5) Strategies for Personality Development

4.5GROUP PROCESSES

(1) Group: its nature
(2) Social influence
(3) Leadership
(4) Intergroup Conflicts

OPTIONAL MODULE

4.6 A. WORK

(1) Education and Work
(2) Vocational choice
(3) Career Development
(4) Work in Organizations
(5) Vocational Adjustment

4.6 B. STRESS

(1) Stress processes
(2) Stress and health problems
(3) Stress management
(4) Promoting Well-being.

4.6 C. STREES

(1) Development Patterns in Early Childhood.
(2) Play Centre – Organization
(3) Play Centre – Structural Details
(4) Planning and Conducting Programmes
(5) Involvement of Parents and Community

SENIOR SECONDARY(12th)
PUBLIC ADMINISTRATION

Marks-100

I. Administrative Machinery in India:
II.
a) Central Secretariat – Organisation and Functions
b) Prime Minister's Secretariat – Organisation and Functions
c) State Secretariat – Directorate – Organisation and Functions
d) District Collectorate – Organisation and Functions

III. Planning Machinery in India:
IV. Planning Commission – Organisation and Functions
a) National Development Council – Organisation and Functions
b) State Planning Board – Organisation and Functions
c) District Planning Committee – Organisation and Functions

III. Urban Development Administration

a) Municipalities – Organisation and Functions
b) Municipal Corporations – Organisation and Functions
c) Urban Development Authorities – Organisation and Functions
d) NGOs and Urban Development

IV. Rural Development Administration

a) Panchayati Raj Institutions – Organisation and Functions
b) Rural Co-operative Societies – Organisation and Functions
c) Special Agencies, ITDA & DRDA – Organisation and Functions
d) Self – Help Groups & Rural Development

V. Social Welfare Administration

a) Woman Welfare Programmes
b) Scheduled castes & Scheduled Tribes Welfare Programmes
c) Backward Classes Welfare Programmes
d) Minority Welfare Programmes

VI. Citizen Administration

a) Citizen Charter
b) Central Vigilance Commission
c) Lok Ayukta
d) Human Rights Commission

VII. Good Governance

a) Right to Information Act
b) Information Technology
c) E-Governance
d) People's participation in Governance

VIII. Emerging Trends and Issues in Administration:
a) Corruption in Administration
b) Administrative Ethics
c) Public – Private Partnership
d) Globalisation and Public Administration

Total Teaching Periods :	130
Revision:	145

Reference Books:

1. Mohit Battacharya : New Horizans of Public Administration, Jawahar Publications, New Delhi – 2008
2. Ramesh K. Arora, & Rajni Goyal: Indian Public Administration Institutions and issues.
3. S.R. Maheswari: Local Government in India
4. A. Avasti: General Administration
5. Avasti and Avasti: Indian Administration

PUNJABI

(Cade No. 514)

CLASS XII

BRIEF

One Paper **1 Hour** **Marks : l00 Periods : 200**

Units/Area of Learning	Marks
A. Reading Skills (Comprehension of an unseenpassage)	10
B. Writing Skills	25
C. AppliedGrammar	15
D. Literature	50

LANGUAGE MarksSuggested

Periods

Section A : Reading Skills 10

One unseen passage of about 150 words followed by 4-5 questions to test comprehension and inferring meanings.Asuggestive heading may be asked and vocabulary may be tested.

Section B : Writing Skills **25**

1.	Essay on a current topic related to social or culturalissue	10
2.	Story building, composing messages and factual	07
3.	Letter to the editor	08

Section C : Applied Grammar 15

1.	Idioms	03
2.	Proverbs	02
3.	Marking punctuation marks in a small paragraph	03
4.	Analysis of Sentences	04
5.	Correction of Sentences	03

Section D : Literature **50**

Poetry **15**

1. Questions based on one out of two extracts taken from the poem
2. Questions to test factual comprehension and interpretation

Drama **15**

1. Four short type questions based on one out of two extracts taken from drama
2. A long question to test the theme, plot, character and setting based on the drama

Short Story **10**

1. Questions based on one out of two extracts taken from the story
2. Questions to test the theme/character based on

   the short story. History of Punjabi Literature

The origin, growth, development and characteristics of Punjabi Literature with special reference to the following literature movements and forms : Adikal, Gurmat Kav, Sufi Kav, Modern Poetry, Novel, Drama, Prose and Short Story.

Texts and Courses in Literature :

Poetry :

Kav Kirti published by Guru Nanak Dev University, Amritsar The following poets are to be studied

1. Bhai Veer Singh
2. Dhani Ram Chatrik
3. Puran Singh
4. Prof. Mohan Singh
5. Amrita Pritam
6. Pritam Singh Safir
7. Bawa Balwant
8. Harbhajan Singh
9. Shiv Kumar
10. Tara Singh

Drama :

Shobha Shakti by Dr. Harcharan Singh, Published by Arsee Publishers, Pleasure Garden Chandni Chowk, Delhi.

Short Story

Katha Kahani, published by Punjabi Academy, New Delhi-55

SANSKRIT

(Code No. 503)

Class XII

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SOCIOLOGY

(Cade No. 529)

CLASS XII

BRIEF

Sociology is introduced as an elective subject at the senior secondary stage. The syllabus is designed to help learners to reflect on what they hear and see in the course of everyday life and develop a constructive attitude towards society in change; to equip a learner with concepts and theoretical skills for the purpose. The curriculum of Sociology at this stage should enable the learner to understand dynamics of human behaviour in all its complexities and manifestations. The learners of today need answers and explanations to satisfy the questions that arise in their minds while trying to understand social world. Therefore, there is a need to develop an analytical approach towards the social structure so that they can meaningfully participate in the process of social change. There is scope in the syllabus not only for interactive learning, based on exercises and project work but also for teachers and students to jointly innovate new ways of learning.

Sociology studies society. The child's familiarity with the society in which she /he lives in makes the study of sociology a double edged experience. At one level sociology studies institutions such as family and kinship, class, caste and tribe religion and region- contexts with which children are familiar of, even if differentially. For India is a society which is varied both horizontally and vertically. The effort in the books will be to grapple overtly with this both as a source of strength and as a site for interrogation.

Significantly the intellectual legacy of sociology equips the discipline with a plural perspective that overtly engages with the need for defamiliarization, to unlearn and question the given. This interrogative and critical character of sociology also makes it possible to understand both other cultures as well as relearn about one's own culture.

This plural perspective makes for an inbuilt richness and openness that not too many other disciplines in practice share. From its very inception sociology has had mutually enriching and contesting traditions of an interpretative method that openly takes into account 'subjectivity' and causal explanations that pay due importance to establishing causal correspondences with considerable sophistication. Not surprisingly its field work tradition also entails large scale survey methods as well as a rich ethnographic tradition. Indeed Indian sociology, in particular has bridged this distinction between what has often been seen as distinct approaches

of sociology and social anthropology. The syllabus provides ample opportunity to make the child familiar with the excitement of field work as well as its theoretical significance for the very discipline of sociology.

The plural legacy of sociology also enables a bird's eye view and a worm's eye view of the society the child lives in. This is particularly true today when the local is inextricably defined and shaped by macro global processes.

The syllabus proceeds with the assumption that gender as an organizing principle of society cannot be treated as an add on topic but is fundamental to the manner that all chapters shall be dealt with. The chapters shall seek for a child centric approach that makes it possible to connect the lived reality of children with social structures and social processes that sociology studies.

A conscious effort will be made to build into the chapters a scope for exploration of society that makes learning a process of discovery. A way towards this is to deal with sociological concepts not as givens but a product of societal actions humanly constructed and therefore open to questioning.

OBJECTIVES

1. To enable learners to relate classroom teaching to their outside environment.
2. To introduce them to the basic concepts of sociology that would enable them toobserve and interpret social life.
3. To be aware of the complexity of social processes.
4. To appreciate diversity in society in India and the world at large.
5. To build the capacity of students to understand and analyze the changes in contemporaryIndian society.

One Paper Theory **1 Hour** **Marks 100**

Unitwise Weightage

Units

1.	Introducing Indian Society	Non evaluative
2.	Demographic Structure & Indian Society	8
3.	Social Institutions-Continuity and change	8
4.	Market as a Social Institution	8
5.	Pattern of Social Inequality and Exclusion	8
6.	Challenges of Cultural Deiversity	8
7.	Suggestions for Project Work	Non evaluative
	Change and Development in Indian Society	
8.	Structural Change	8
9.	Cultural Change	8
10.	The Story of Democracy	8
11.	Change and Development in Rural Society	8
12.	Change and Development in Industrial Society	8
13.	Globalization and Social Change	8
14.	Mass Media and Communications	8
15.	Social Movements	4

INDIAN SOCIETY

Unit 1 : Introducing Indian Society

Colonialism, Nationalism, Class and Community

Unit 2 : Demographic Structure And Indian Society

Rural-Urban Linkages and Divisions

Unit 3: Social Institutions: Continuity & Change

Family and Kinship

The Caste System

Unit 4 : Market As A Social Institution

Market as a Social Institution

Unit 5 : Pattern of Social Inquality & Exclusion

Caste Prejudice, Scheduled Castes and Other Backward Classes

Marginalization of Tribal Communities

The Struggle for Women's Equality

The Protection of Religious Minorities

Caring for the Differently Abled

Unit 6 : The Challenges Of Cultural Diversity

Problems of Communalism, Regionalism, Casteism & Patriarchy Role of the State in a Plural and Unequal Society

What We Share

Unit 7 : Suggestions For Project Work

B. CHANGE AND DEVELOPMENT IN INDIA

Unit 8 : Structural Change

Colonialism, Industrialization, Urbanization.

Unit 9 : Cultural Change

Modernization, Westernization, Sanskritisation, Secularization . Social Reform Movements & Laws

Unit 10 : The Story Of Democracy

The Constitution as an instrument of Social Change Parties, Pressure Groups and Democratic Politics Panchayati Raj and the Challenges of Social Transformation

Unit 11 : Change And Development In Rural Society

Land Reforms, Green Revolution and Agrarian Society

Unit 12 : Change And Development In Industrial Society

From Planned Industrialization to Liberalization Changes in the Class Structure

Unit 13 : Globalisation And Social Change

Unit 14 : Mass Media And Communication Process

Unit 15 : Social Movements

Class-Based Movements : Workers, Peasants.

Caste-Based Movements: Dalit Movement, Backward Castes, Trends in Upper Caste Responses.

Women's Movements in Independent India. Tribal Movements.

Environmental Movements.

Recommended textbooks

1. Indian Society - Sociology, Published by NCERT

TAMIL

(Code No. 515)

CLASS XII

BRIEF

One Paper **1 Hour** **Marks: 100**

LANGUAGE

		Marks
Section A : Grammar:		**30**
Letter writing :		
Grammar :		15
1.	Correction of Errors	5
2.	Vallinam Migum Idangal	5
3.	Do as directed	5

Thanvinai, peravinai, Seivinai, Seyapattuvinai, Udan Paattuvinai. Edhirmaraivinai, Nerkuttrru,Ayar Kurtru, Thani Vakkiyam. Thodar Vakkiyam, Kalavai Vakkiyam.

Letter Writing 10

Paraattuk Kaditham,Aarudhal Kaditham Sirappu Nigazhchigallukku Azhaippu Kaditham, Vinnappak Kaditham, Muraieettu Kaditham

Section B

Unseen reading and comprehension 10

Patthi vina vidai

Neerkaanal (Karpanai)

(or) Patthi or Seyyul Pagudi Koduthu vinaAmaithal

Section C

Composition and Essay Writing 15

(Literature, Science, CurrentAffairs)

LITERATURE

SECTION A

Prose from prescribed text (Answer only two questions. 20

Following lessons) : lessonno:

1. Vuyar thanich Chemmozhi-by Paridhimaar Kalainjar

2. Samarasam by Thiru-vi-ka

3. Kavidhai-Prof.S.Vaiapurippillai

4. Vaazhkai-by Illavazhaganaar

5. Neethe noolgalil Ilakkia Nayam by Dr. A. Chidambaranathan.

SECTION B **15**

Poetry and figures of speech from prescribed textPoetry SectionQuestions10

Annotation 05

1. Vazhthu
   - (i) Irai vazhthu
   - (ii) Mozhi Vazhthu
   - (iii) Naattu Vazhthu
2. Thokai Nuulkal
   - (i) Purunaanuru
   - (ii) Aganaannuru
   - (iii) Kurunthogai
3. Thirukural: Sainanriarithal, Porraiudaimai,Arrivudaimai, Vinaithitpam.
4. Thodarnelai seijul
   - (i) Silappadhikaaram
   - (ii) Kamba Ramayanam
   - (iv) Pandian Parisu

SECTION C **15** **35**

Kathai Kovai (Non-detailed text book) class-XII part-I Tamil

Short Story

Story No:

1. Paalvannam Pillai-by Pudumai Pithan
2. Aayaa-T. Janakiraman
3. Mookkappillaiveettu Virundhu-by Vallikannan
4. Chattai-Jeyakanthan
5. Veli-Rajam Krishnan

Text Books:

1. Podhu Thamizh Text Book Class XII Edition 2005

   (Published byTamilnadu Text Book Society)
2. Kathai Kovai-non-detailed Text book Class XII-Edition 2005

   (published byTamilnadu Text Book Society)

TELUGU

(Code No. 516)

CLASS XII

BRIEF

One Paper **1 Hour** **Marks: 100**

		Marks
SECTION-A (Grammer)		**22**
1.	Prosody and Rhetorics	
	(i) Prosody	5
	(ii) Alankaras	10
	Metre: Champakamala, Utpalamala, Mattebha, Shardula, Ataveladi, Tetagiti, Kandamu and Seesamu	
	Alankaras: Upama, Rupaka, Arthantaranyasa, Slesha and Kramalankara	
2.	Translation of given passage not exceeding	7
SECTION B		
Unseen Reading Comprehension		10
SECTION C		
Composition and Writing		
Descriptive and Narrative essays		10
SECTION D		
Literature		58

Prescribed Book: For both prose and poetry Intermediate Telugu II year Sahitee Manjusha-Part II Printed and Published by Telugu Akadami and Board of Intermediate Education, Andhra Pradesh (2004 Edition)

1. Prose: From prescribed text and non-detailed text. 22

Lessons to be studied:

1. Ammamma
2. Abhyudaya Kavita
3. Anuvaada Sahityamu

Non-detailed Text: **28**

Alluri Sitaramaraju Natakam (Telugu upavachakam Printed and published by

TeluguAkademi and Board of Intermediate Education Hyderabad.A.P. (2004 Edition)

Lessons to be studied:

1. Girika Balyam
2. Subhashitalu
3. Mutyala saralu

IV. History of Literature 16

From PrabandhaAge to ModernAge

(i) Only the following poets to be studied: Peddana,

Dhurjati, Chemakura, Kandukuri, Rayaprolu, Sri Sri,

Tirupati Venkata Kavulu and Viswanatha Satyanarayana

(ii) Salient features of Satakas (Neeti and Bhakti) Novel and Drama

Recommended Books:

(i) Andhra Vangmaya Charitra-Dr. D.V. Avadhani,

Andhra Saraswata Parishad, Tilak Road, Hyderabad

(ii) History of Telugu Literature by

(a) Dr. G. Nagaiah-Vol.I

(b) Dr. Dvana Sastry

URDU

(Code No. 504)

CLASS XII

BRIEF

One Paper **1 Hours** **Marks : 100**

Section A : **Marks 60**

1.	Reading Skills :		10
	(i)	Comprehension of an unseen passage (factual) of about 150 words followed by five questions.	
2.	Writing Skills :		50
	(i)	Essay	15
	(ii)	Letter writing (Personal, business and official connected with daily life and application writing)	10
	(iii)	Precis Writing	10
	(iv)	Sentence making with the help of idiomatic phrases	10
	(v)	Advertisements	5

Section B : **Marks 40**

A. Book I **20**

Jangal Ki Ek Rat

B. Book II **20**

Heroine Ki Talash

Prescribed Text Book :

1. Jangal Ki Ek Rat by Rehan Ahmed Abbasi
   published by Maktaba Payam-e-Ta'leem, N. Delhi.
2. Heroine Ki Talash by Prof. M. Mujeeb
   published by Maktaba Jamia, New Delhi.

Recommended Book :

1. Urdu Qawaid, published by the NCERT, New Delhi.