BIOLOGY (Code No. 044)
2020-21

The present curriculum provides the students with updated concepts along with an extended exposure to contemporary areas of the subject. The curriculum also aims at emphasizing the underlying principles that are common to animals, plants and microorganisms as well as highlighting the relationship of Biology with other areas of knowledge. The format of the curriculum allows a simple, clear, sequential flow of concepts. It relates the study of biology to real life through the use of technology. It links the discoveries and innovations in biology to everyday life such as environment, industry, health and agriculture. The updated curriculum focuses on understanding and application of scientific principles, while ensuring that ample opportunities and scope for learning and appreciating basic concepts continue to be available within its framework. The curriculum is expected to:

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

It is expected that the students would get an exposure to various branches of Biology in the curriculum in a more contextual and systematic manner as they study its various units.

BIOLOGY (Code No. 044)
COURSE STRUCTURE
CLASS XI (2020 -21) (THEORY)

Time:3 Hours **Max. Marks: 70**

Unit	Title	Marks
I	Diversity of Living Organisms	15
II	Structural Organization in Plants and Animals	8
III	Cell: Structure and Function	15
IV	Plant Physiology	15
V	Human Physiology	17
	Total	**70**

Unit-I Diversity of Living Organisms

Chapter-1: The Living World

What is living? Biodiversity; Need for classification; three domains of life; concept of species and taxonomical hierarchy; binomial nomenclature.

Chapter-2: Biological Classification

Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids.

Chapter-3: Plant Kingdom

Salient features and classification of plants into major groups - Algae, Bryophyta, Pteridophyta and Gymnospermae. (salient and distinguishing features and a few examples of each category).

Chapter-4: Animal Kingdom

Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and distinguishing features of a few examples of each category). (No live animals or specimen should be displayed.)

Unit-II Structural Organization in Animals and Plants

Chapter-5: Morphology of Flowering Plants

Morphology of inflorescence and flower, Description of 01 family: Solanaceae or Liliaceae (to be dealt along with the relevant experiments of the Practical Syllabus).

Chapter-7: Structural Organisation in Animals

Animal tissues.

Unit-III Cell: Structure and Function

Chapter-8: Cell-The Unit of Life

Cell theory and cell as the basic unit of life, structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; cell envelope; cell membrane, cell wall; cell organelles - structure and function; endomembrane system, endoplasmic reticulum, golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.

Chapter-9: Biomolecules

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes- types, properties, enzyme action.

Chapter-10: Cell Cycle and Cell Division

Cell cycle, mitosis, meiosis and their significance

Unit-IV Plant Physiology

Chapter-13: Photosynthesis in Higher Plants

Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

Chapter-14: Respiration in Plants

Exchange of gases; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient.

Chapter-15: Plant - Growth and Development

Growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA.

Unit-V Human Physiology

Chapter-17: Breathing and Exchange of Gases

Respiratory organs in animals (recall only); Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volume; disorders related to respiration - asthma, emphysema, occupational respiratory disorders.

Chapter-18: Body Fluids and Circulation

Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.

Chapter-19: Excretory Products and their Elimination

Modes of excretion - ammonotelism, ureotelism, uricotelism; human excretory system – structure and function; urine formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.

Chapter-20: Locomotion and Movement

Skeletal muscle, contractile proteins and muscle contraction.

Chapter-21: Neural Control and Coordination

Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse.

Chapter-22: Chemical Coordination and Integration

Endocrine glands and hormones; human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

Note: Diseases related to all the human physiological systems to be taught in brief.

PRACTICALS

Time Allowed : Three hours **Max. Marks: 30**

Evaluation Scheme		Marks
One Major Experiment Part A (Experiment No- 1,3)		5
One Minor Experiment Part A (Experiment No- 4,5,6)		4
Slide Preparation Part A (Experiment No- 2)		5
Spotting Part B		7
Practical Record + Viva Voce	Credit to the students' work over the academic session may be given	4
Project Record + Viva Voce		5
Total		**30**

A: List of Experiments

1. Study and describe a locally available common flowering plant, from any one family: Solanaceae or Liliaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams).
2. Study of distribution of stomata in the upper and lower surfaces of leaves.
3. Separation of plant pigments through paper chromatography.
4. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
5. Test for presence of sugar in urine.
6. Test for presence of albumin in urine.

B. Study/Observer of the following (spotting)

1. Parts of a compound microscope.
2. Specimens/slides/models and identification with reasons - Bacteria, *Oscillatoria, Spirogyra, Rhizopus*, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.
3. Virtual specimens/slides/models and identifying features of - *Amoeba, Hydra,* liverfluke, *Ascaris*, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.
4. Tissues and diversity in shape and size of animal cells (squamous epithelium, smooth, skeletal and cardiac muscle fibers and mammalian blood smear) through temporary/permanent slides.
5. Mitosis in onion root tip cells and animal cells (grasshopper) from permanent slides.

Practical Examination for Visually Impaired Students Class XI

Note: The 'Evaluation schemes' and 'General Guidelines' for visually impaired students as given for Class XII may be followed.

A. **Items for Identification/Familiarity with the apparatus / equipments/animal and plant material / chemicals etc. for assessment in practicals (All experiments)**

- Plants of Solanaceae - Brinjal, Petunia, any other or Liliaceae- Any of the Lilies.
- Mushroom, Succulents such as *Aloe vera*/*Kalanchoe*, Raisins, Potatoes.
- Honey comb, Mollusc shell, Model of cockroach, Pigeon and Star fish.

- Compound microscope, Test tube, Petri dish, Beaker, Scalpel.
- Chromatography paper, Chromatography chamber, Alcohol.

B. **List of Practicals**

1. Study one locally available common flowering plant of the family– Solanaceae or Liliaceae and identify inflorescence/flower.
2. Study the parts of a compound microscope- eye piece and objective lens, mirror, stage, coarse and fine adjustment knobs.
3. Study honey-bee/butterfly, snail shell, Starfish, Pigeon (through models).
4. Identify the given specimen of a fungus – Mushroom, gymnosperm- pine cone

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

Prescribed Books:

1. Biology Class-XI, Published by NCERT
2. Other related books and manuals brought out by NCERT (including multimedia)

CLASS XII (2020 - 21) (THEORY)

Time:3 Hours **Max. Marks:70**

Unit	Title	Marks
VI	Reproduction	14
VII	Genetics and Evolution	18
VIII	Biology and Human Welfare	14
IX	Biotechnology and its Applications	12
X	Ecology and Environment	12
	Total	**70**

Unit-VI Reproduction

Chapter-2: Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

Chapter-3: Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

Chapter-4: Reproductive Health

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary

idea for general awareness).

Unit-VII Genetics and Evolution

Chapter-5: Principles of Inheritance and Variation

Heredity and variation: Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in human being, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans -thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Chapter-6: Molecular Basis of Inheritance

Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central Dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Genome, Human and rice genome projects; DNA fingerprinting.

Unit-VIII Biology and Human Welfare

Chapter-8: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Chapter-10: Microbes in Human Welfare

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

Unit-IX Biotechnology and its Applications

Chapter-11: Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Chapter-12: Biotechnology and its Application

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

Unit-X Ecology and Environment

Chapter-13: Organisms and Populations

Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution.

Chapter-15: Biodiversity and its Conservation

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

PRACTICALS

Time allowed: 3 Hours **Max. Marks: 30**

<table>
<tr><th colspan="2">Evaluation Scheme</th><th>Marks</th></tr>
<tr><td colspan="2">One Major Experiment 5, 6</td><td>5</td></tr>
<tr><td colspan="2">One Minor Experiment 2, 3</td><td>4</td></tr>
<tr><td colspan="2">Slide Preparation 1, 4</td><td>5</td></tr>
<tr><td colspan="2">Spotting</td><td>7</td></tr>
<tr><td>Practical Record + Viva Voce</td><td rowspan="2">Credit to the students' work over the academic session may be given</td><td>4</td></tr>
<tr><td>Investigatory Project and its Project and its Record + Viva Voce</td><td>5</td></tr>
<tr><td colspan="2">Total</td><td>30</td></tr>
</table>

A. List of Experiments

1. Prepare a temporary mount to observe pollen germination.
2. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them.
3. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organism.
4. Prepare a temporary mount of onion root tip to study mitosis.
5. Study the effect of different temperatures or three different pH on the activity of salivary amylase on starch.
6. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.

B. Study/observation of the following (Spotting)

1. Flowers adapted to pollination by different agencies (wind, insects, birds).
2. Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
3. Meiosis in onion bud cell or grasshopper testis through permanent slides.
4. T.S. of blastula through permanent slides (Mammalian).
5. Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness.
6. Common disease causing organisms like *Ascaris, Entamoeba, Plasmodium*, any fungus causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause.
7. Two plants and two animals (models/virtual images) found in xeric conditions. Comment

upon their morphological adaptations.

8. Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.

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

Time Allowed: Two hours **Max. Marks: 30**

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

General Guidelines

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

Class XII

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

- Soil from different sites- sandy, clayey, loamy; Small potted plants, Cactus/*Opuntia* (model), Large flowers, Maize inflorescence.
- Model of *Ascaris* and developmental stages of frog highlighting morula and blastula.
- Beaker, flask, petri plates, test tubes, aluminium foil, paint brush, bunsen burner/spirit lamp/water bath.
- Starch solution, iodine, ice cubes.

A. List of Practicals

1. Study of the soil obtained from at least two different sites for their texture.
2. Study of flowers adapted to pollination by different agencies (wind, insects).
3. Identification of T.S of morula or blastula of frog (model).
4. Preparation of pedigree charts of genetic traits such as rolling of tongue, colour blindness.
5. Identify common disease causing organisms like *Ascaris (Model)* and learn some common symptoms of the disease that they cause.
6. Comment upon the morphological adaptations of plants found in xerophytic conditions.

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

Prescribed Books:

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

Assessment Areas (Theory) 2020-21
Class XII
Biology (044)

Time : 3 hrs. **Maximum Marks: 70 Marks**

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

Note:

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

Suggestive verbs for various competencies

- **Demonstrate Knowledge and Understanding**
  State, name, list, identify, define, suggest, describe, outline, summarize, etc.
- **Application of Knowledge/Concepts**
  Calculate, illustrate, show, adapt, explain, distinguish, etc.
- **Analyze, Evaluate and Create**
  Interpret, analyse, compare, contrast, examine, evaluate, discuss, construct, etc.

8. CHEMISTRY (Code No. 043)

Rationale

Higher Secondary is the most crucial stage of school education because at this juncture specialized discipline based, content -oriented courses are introduced. Students reach this stage after 10 years of general education and opt for Chemistry with a purpose of pursuing their career in basic sciences or professional courses like medicine, engineering, technology and study courses in applied areas of science and technology at tertiary level. Therefore, there is a need to provide learners with sufficient conceptual background of Chemistry, which will make them competent to meet the challenges of academic and professional courses after the senior secondary stage.

The new and updated curriculum is based on disciplinary approach with rigour and depth taking care that the syllabus is not heavy and at the same time it is comparable to the international level. The knowledge related to the subject of Chemistry has undergone tremendous changes during the past one decade. Many new areas like synthetic materials, bio -molecules, natural resources, industrial chemistry are coming in a big way and deserve to be an integral part of chemistry syllabus at senior secondary stage. At international level, new formulations and nomenclature of elements and compounds, symbols and units of physical quantities floated by scientific bodies like IUPAC and CGPM are of immense importance and need to be incorporated in the updated syllabus. The revised syllabus takes care of all these aspects. Greater emphasis has been laid on use of new nomenclature, symbols and formulations, teaching of fundamental concepts, application of concepts in chemistry to industry/ technology, logical sequencing of units, removal of obsolete content and repetition, etc.

Objectives

The curriculum of Chemistry at Senior Secondary Stage aims to:

- promote understanding of basic facts and concepts in chemistry while retaining the excitement of chemistry.
- make students capable of studying chemistry in academic and professional courses (such as medicine, engineering, technology) at tertiary level.
- expose the students to various emerging new areas of chemistry and apprise them with their relevance in future studies and their application in various spheres of chemical sciences and technology.
- equip students to face various challenges related to health, nutrition, environment, population, weather, industries and agriculture.
- develop problem solving skills in students.
- expose the students to different processes used in industries and their technological applications.
- apprise students with interface of chemistry with other disciplines of science such as physics, biology, geology, engineering etc.
- acquaint students with different aspects of chemistry used in daily life.
- develop an interest in students to study chemistry as a discipline.
- integrate life skills and values in the context of chemistry.

COURSE STRUCTURE CLASS-XI
(THEORY) (2020-21)

Total Periods (Theory 119 + Practical 44)

Time: 3Hours **Total Marks70**

Unit No.	Title	No. of Periods	Marks
Unit I	Some Basic Concepts of Chemistry	10	11
Unit II	Structure of Atom	12	
Unit III	Classification of Elements and Periodicity in Properties	6	04
Unit IV	Chemical Bonding and Molecular Structure	14	21
Unit V	States of Matter: Gases and Liquids	9	
Unit VI	Chemical Thermodynamics	14	
Unit VII	Equilibrium	12	
Unit VIII	Redox Reactions	4	16
Unit IX	Hydrogen	4	
Unit X	s -Block Elements	5	
Unit XI	Some p -Block Elements	9	
Unit XII	Organic Chemistry: Some basic Principles and Techniques	10	18
Unit XIII	Hydrocarbons	10	
	Total	**119**	**70**

Unit I: Some Basic Concepts of Chemistry **10 Periods**

General Introduction: Importance and scope of Chemistry.

Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

Unit II: Structure of Atom **12 Periods**

Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

Unit III: Classification of Elements and Periodicity in Properties 06 Periods

Modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

Unit IV: Chemical Bonding and Molecular Structure 14 Periods

Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules(qualitative idea only), Hydrogen bond.

Unit V: States of Matter: Gases and Liquids 9 Periods

Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation and deviation from ideal behavior.

Unit VI: Chemical Thermodynamics 14 Periods

Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions.

First law of thermodynamics -internal energy and enthalpy, measurement of ΔU and ΔH, Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics (brief introduction)

Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes.

Third law of thermodynamics (brief introduction).

Unit VII: Equilibrium 12 Periods

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, buffer solution, solubility product, common ion effect (with illustrative examples).

Unit VIII: Redox Reactions 04 Periods

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number.

UnitIX: Hydrogen 04 Periods

Position of hydrogen in periodic table, occurrence, isotopes, hydrides-ionic covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen as a fuel.

Unit X: s-Block Elements (Alkali and Alkaline Earth Metals) 5 Period

Group 1 and Group 2 Elements

General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens, uses.

Unit XI: Some p-Block Elements 9 Periods

General Introduction to p -Block Elements

Group 13 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties.

Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties.

Unit XII: Organic Chemistry -Some Basic Principles and Techniques 10 Periods

General introduction, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond:

inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

Unit XIII: Hydrocarbons 10 Periods

Classification of Hydrocarbons

Aliphatic Hydrocarbons:

Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.

Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water.

Aromatic Hydrocarbons:

Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene. Carcinogenicity and toxicity.

PRACTICALS

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

PRACTICAL SYLLABUS **Total Periods: 44**

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

A. Basic Laboratory Techniques

1. Cutting glass tube and glass rod
2. Bending a glass tube
3. Drawing out a glass jet
4. Boring a cork

B. Characterization and Purification of Chemical Substances

1. Determination of melting point of an organic compound.
2. Determination of boiling point of an organic compound.
3. Crystallization of impure sample of any one of the following: Alum, Copper Sulphate, Benzoic Acid.

C. Quantitative Estimation

i. Using a mechanical balance/electronic balance.
ii. Preparation of standard solution of Oxalic acid.
iii. Determination of strength of a given solution of Sodium hydroxide by titrating it against standard solution of Oxalic acid.
iv. Preparation of standard solution of Sodium carbonate.
v. Determination of strength of a given solution of hydrochloric acid by titrating it against standard Sodium Carbonate solution.

D. Qualitative Analysis

a) Determination of one anion and one cation in a given salt

Cations- Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+

Anions – $(CO_3)^{2-}$, S^{2-}, NO_2^-, SO_3^{2-}, SO_4^{2-}, NO_3^-, Cl^-, Br^-, I^-, PO_4^{3-}, $C_2O_4^{2-}$, CH_3COO^-

(Note: Insoluble salts excluded)

b) Detection of -Nitrogen, Sulphur, Chlorine in organic compounds.

c) PROJECTS

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

A few suggested Projects

- Checking the bacterial contamination in drinking water by testing sulphide ion
- Study of the methods of purification of water
- Testing the hardness, presence of Iron, Fluoride, Chloride, etc., depending upon the regional variation in drinking water and study of causes of presence of these ions above permissible limit (if any).
- Investigation of the foaming capacity of different washing soaps and the effect of addition of Sodium carbonate on it
- Study the acidity of different samples of tea leaves.
- Determination of the rate of evaporation of different liquids
- Study the effect of acids and bases on the tensile strength of fibers.
- Study of acidity of fruit and vegetable juices.

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

Practical Examination for Visually Impaired Students
Class XI

Note: Same Evaluation scheme and general guidelines for visually impaired students as given for Class XII may be followed.

A. List of apparatus for identification for assessment in practicals (All experiments)

Beaker, tripod stand, wire gauze, glass rod, funnel, filter paper, Bunsen burner, test tube, test tube stand, dropper, test tube holder, ignition tube, china dish, tongs, standard flask, pipette, burette, conical flask, clamp stand, dropper, wash bottle

- Odour detection in qualitative analysis
- Procedure/Setup of the apparatus

B. List of Experiments

A. Characterization and Purification of Chemical Substances

1. Crystallization of an impure sample of any one of the following: copper sulphate, benzoic acid

B. Experiments based on pH

1. Determination of pH of some solutions obtained from fruit juices, solutions of known and varied concentrations of acids, bases and salts using pH paper
2. Comparing the pH of solutions of strong and weak acids of same concentration.

C. Quantitative estimation

1. Preparation of standard solution of oxalic acid.
2. Determination of molarity of a given solution of sodium hydroxide by titrating it against standard solution of oxalic acid.

D. Qualitative Analysis

1. Determination of one anion and one cation in a given salt
2. Cations - NH^{+}_{4}
   Anions – $(CO_3)^{2-}$, S^{2-}, $(SO_3)^{2-}$, Cl^{-}, CH_3COO^{-}
   (Note: insoluble salts excluded)
3. Detection of Nitrogen in the given organic compound.
4. Detection of Halogen in the given organic compound.

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

Prescribed Books:

1. Chemistry Part – I, Class-XI, Published by NCERT.
2. Chemistry Part – II, Class-XI, Published by NCERT.

CLASS XII (2020-21)
(THEORY)

Total Periods (Theory 98 + Practical 36)

Time : 3 Hours **70 Marks**

Unit No.	Title	No. of Periods	Marks
Unit I	Solid State	8	23
Unit II	Solutions	8	
Unit III	Electrochemistry	7	
Unit IV	Chemical Kinetics	5	
Unit V	Surface Chemistry	5	
Unit VII	p -Block Elements	7	19
Unit VIII	d -and f -Block Elements	7	
Unit IX	Coordination Compounds	8	
Unit X	Haloalkanes and Haloarenes	9	28
Unit XI	Alcohols, Phenols and Ethers	9	
Unit XII	Aldehydes, Ketones and Carboxylic Acids	10	
Unit XIII	Amines	7	
Unit XIV	Biomolecules	8	
	Total	**98**	**70**

Unit I: Solid State **8 Periods**

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects.

Unit II: Solutions **8 Periods**

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties.

Unit III: Electrochemistry **7 Periods**

Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis.

Unit IV: Chemical Kinetics **5 Periods**

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions).

Unit V: Surface Chemistry **5 Periods**

Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state: distinction between true solutions, colloids and suspension; lyophilic, lyophobic, multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

Unit VII:p-Block Elements **7 Periods**

Group -15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen preparation properties and uses; compounds of Nitrogen: preparation and properties of Ammonia and Nitric Acid.

Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: preparation, properties and uses, classification of Oxides, Ozone, Sulphur -allotropic forms; compounds of Sulphur: preparation properties and uses of Sulphur-dioxide, Sulphuric Acid:-properties and uses; Oxoacids of Sulphur (Structures only).

Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of Chlorine and Hydrochloric acid, interhalogen compounds, Oxoacids of halogens (structures only).

Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit VIII: d and f Block Elements **7 Periods**

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.
Lanthanoids - Electronic configuration, oxidation states and lanthanoid contraction and its consequences.

Unit IX: Coordination Compounds **8 Periods**

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT.

Unit X: Haloalkanes and Haloarenes. **9 Periods**

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

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

Unit XI: Alcohols, Phenols and Ethers **9 Periods**

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration.

Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.

Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

Unit XII: Aldehydes, Ketones and Carboxylic Acids **10 Periods**

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

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

Unit XIII: Amines **7 Periods**

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

Unit XIV: Biomolecules **8 Periods**

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration

Proteins -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins.

Nucleic Acids: DNA and RNA.

PRACTICALS

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

PRACTICAL SYLLABUS **36 Periods**

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

A.Chromatography

i) Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values.

ii) Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in Rf values to be provided).

A. Preparation of Inorganic Compounds

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

B. Tests for the functional groups present in organic compounds:

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

C. Characteristic tests of carbohydrates, fats and proteins in pure samples and their detection in given foodstuffs.

D. Determination of concentration/ molarity of $KMnO_4$ solution by titrating it against a standard solution of:

i) Oxalic acid,

ii) Ferrous Ammonium Sulphate
(Students will be required to prepare standard solutions by weighing themselves).

E. Qualitative analysis

Determination of one cation and one anion in a given salt.

Cation : Pb^{2+}, Cu^{2+} As^{3+}, $A\ell^{3+}$, Fe^{3+}, Mn^{2+}, Zn^{2+}, Cu^{2+}, Ni^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+

Anions: $(CO_3)^{2-}$, S^{2-}, $(SO_3)^{2-}$, $(NO_2)^-$, $(SO_4)^{2-}$, $C\ell^-$, Br^-, I^-, PO^{3-}_4, $(C_2O_4)^{2-}$, CH_3COO^-,NO_3^-

(Note: Insoluble salts excluded)

PROJECT

Scientific investigations involving laboratory testing and collecting information from other sources

A few suggested Projects.

- Study of the presence of oxalate ions in guava fruit at different stages of ripening.
- Study of quantity of casein present in different samples of milk.
- Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.
- Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom).
- Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chilli powder and pepper.

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

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

Time Allowed: Two hours **Max. Marks:30**

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

General Guidelines

- The practical examination will be of two hour duration.
- A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes duration.

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

A. Items for Identification/Familiarity of the apparatus for assessment in practical (All experiments)

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

Hands-on Assessment

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

B. List of Practicals

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

SECTION- A

A Chromatography

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

B Tests for the functional groups present in organic compounds:

(1) Alcoholic and Carboxylic groups.

(2) Aldehydic and Ketonic

C Characteristic tests of carbohydrates and proteins in the given foodstuffs.

D Preparation of Inorganic Compounds- Potash Alum

SECTION-B (Mandatory)

E Quantitative analysis

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

(b) Determination of molarity of $KMnO_4$ solution by titrating it against a standard solution of Oxalic acid.

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

F Qualitative analysis:

(1) Determination of one cation and one anion in a given salt. Cation –NH_4^+

Anions – CO_3^{2-}, S^{2-}, SO_3^{2-}, Cl^-, CH_3COO^-

(Note: Insoluble salts excluded)

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

Prescribed Books:

1. Chemistry Part -I, Class-XII, Published by NCERT.
2. Chemistry Part -II, Class-XII, Published by NCERT.

Computer Science

(Revised)
CLASS-XI
Code No. 083
2020-21

1. Learning Outcomes

- Ability to understand and apply basic computational thinking.
- Ability to understand the notion of data types and data structures and apply in different situations.
- Ability to appreciate the notion of an algorithm and apply its structure including how algorithms handle corner cases.
- Ability to develop a basic understanding of computer systems - architecture, operating system, mobile and cloud computing.
- Ability to work in the cyber world with understanding of cyber ethics, cyber safety and cybercrime
- Ability to make use the value of technology in societies, gender and disability issues and the technology behind biometric ids.

2. Distribution of Marks

Unit No.	Unit Name	Theory Marks	Periods	
			Theory	Practical
I	Computer Systems and Organisation	10	10	5
II	Computational Thinking and Programming - 1	45	50	35
III	Society, Law and Ethics	15	20	----
	Total	70	80	40

Unit I: Computer Systems and Organisation

- Basic computer organisation: description of a computer system and mobile system, CPU, memory, hard disk, I/O, battery.
- Types of software: Application software, System software and Utility software.
- Memory Units: bit, byte, MB, GB, TB, and PB.
- Boolean logic: NOT, AND, OR, NAND, NOR, XOR, NOT, truth tables and De Morgan's laws, Logic circuits
- Number System: numbers in base 2, 8, 16 and binary addition.
- Encoding Schemes : ASCII, ISCII and Unicode

- Concept of Compiler and Interpreter
- Operating System (OS) - need for an operating system, brief introduction to functions of OS, user interface

Unit II: Computational Thinking and Programming - 1

Introduction to Problem solving: Problem solving cycle - Analysing a problem, designing algorithms and representation of algorithm using flowchart and pseudo-code.

Familiarization with the basics of Python programming: a simple “hello world" program, the process of writing a program (Interactive & Script mode), running it and print statements; simple data-types: integer, float and string.

- Features of Python, Python Character Set, Token & Identifiers, Keywords, Literals, Delimiters, Operators.
- Comments: (Single line & Multiline/ Continuation statements), Clarity & Simplification of expression
- Introduce the notion of a variable and methods to manipulate it (concept of L-value and R-value even if not taught explicitly).
- Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence.
- Operators & types: Binary operators-Arithmetic, Relational Operators, Logical Operators, Augmented Assignment Operators.
- Execution of a program, errors- syntax error, run-time error and logical error.
- Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number.
- Notion of iterative computation and control flow: for(range(),len()), while, using flowcharts, suggested programs: calculation of simple and compound interests, finding the factorial of a positive number etc.
- Strings: Traversal, operations – concatenation, repetition, membership; functions/methods–len(), capitalize(), title(), upper(), lower(), count(), find(), index(), isalnum(), islower(), isupper(), isspace(), isalpha(), isdigit(), split(), partition(), strip(), lstrip(), rstrip(), replace(); String slicing.
- Lists: Definition, Creation of a list, Traversal of a list. Operations on a list - concatenation, repetition, membership; functions/methods–len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), min(), max(), sum(); Lists Slicing; Nested lists; finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list.

- Tuples: Definition, Creation of a Tuple, Traversal of a tuple. Operations on a tuple - concatenation, repetition, membership; functions/methods – len(), tuple(), count(), index(), sorted(), min(), max(), sum(); Nested tuple; Tuple slicing; finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple.
- Dictionary: Definition, Creation, Accessing elements of a dictionary, add an item, modify an item in a dictionary; Traversal, functions/methods – len(), dict(), keys(), values(), items(), get(), update(), del(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted() copy(); Suggested programs : count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them.
- Introduction to Python modules: Importing math module (pi, e, sqrt, ceil, floor, pow, fabs, sin, cos, tan); random module (random, randint, randrange), statistics module (mean, median, mode).

Unit III: Society, Law and Ethics

- Cyber safety: safely browsing the web, identity protection, confidentiality, social networks, cyber trolls and bullying.
- Appropriate usage of social networks: spread of rumours, and common social networking sites (Twitter, LinkedIn, and Facebook) and specific usage rules.
- Safely accessing web sites: adware, malware, viruses, trojans
- Safely communicating data: secure connections, eavesdropping, phishing and identity verification.
- Intellectual property rights, plagiarism, digital rights management, and licensing (Creative Commons, GPL and Apache), open source, open data, privacy.
- Privacy laws, fraud; cyber-crime- phishing, illegal downloads, child pornography, scams; cyber forensics, IT Act, 2000.
- Technology and society:
    - understanding of societal issues and cultural changes induced by technology.
    - E-waste management: proper disposal of used electronic gadgets.
    - Identity theft, unique ids and biometrics.
    - Gender and disability issues while teaching and using computers.

3. Practical

S.No.	Area	Marks (Total=30)
1.	**Lab Test (12 marks)**	
	Python program (60% logic + 20% documentation + 20% code quality)	**12**
2.	**Report File + Viva (10 marks)**	
	Report file: Minimum 20 Python programs	**7**
	Viva voce	**3**
3.	**Project (8 marks)** (that uses most of the concepts that have been learnt See CS-XII for the rules regarding the projects)	

4. Suggested Practical List

Python Programming

- Input a welcome message and display it.
- Input two numbers and display the larger / smaller number.
- Input three numbers and display the largest / smallest number.
- Given two integers x and n, compute x^n.
- Write a program to input the value of x and n and print the sum of the following series:
  - $1+x+x^2+x^3+x^4+ \ldots\ldots\ldots x^n$
  - $1-x+x^2-x^3+x^4+ \ldots\ldots\ldots x^n$
  - $x + \frac{x^2}{2} - \frac{x^3}{3} + \frac{x^4}{4} + \ldots\ldots\ldots \frac{x^n}{n}$
  - $x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} + \ldots\ldots\ldots \frac{x^n}{n!}$

- Determine whether a number is a perfect number, an armstrong number or a palindrome.
- Input a number and check if the number is a prime or composite number.
- Display the terms of a Fibonacci series.
- Compute the greatest common divisor and least common multiple of two integers.
- Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
- Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.
- Find the largest/smallest number in a list/tuple
- Input a list of numbers and swap elements at the even location with the elements at the odd location.
- Input a list/tuple of elements, search for a given element in the list/tuple.
- Input a list of numbers and test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such number from the given list of numbers.
- Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have marks above 75.

Computer Science
CLASS-XII
Code No. 083
2020-21

1. Prerequisites

Computer Science- Class XI

2. Learning Outcomes

- Apply the concept of functions.
- Ability to use Python libraries.
- Apply the concept of file handling.
- Ability to use basic data structures: Stacks.
- Explain the basics of computer networks.
- Ability to use connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Theory Marks	Periods	
			Theory	Practical
I	Computational Thinking and Programming – 2	40	50	30
II	Computer Networks	10	10	---
III	Database Management	20	20	10
	Total	70	80	40

Unit I: Computational Thinking and Programming - 2

- Revision of the basics of Python covered in Class XI.
- Functions: scope, parameter passing, mutable/immutable properties of data objects, passing strings, lists, tuples, dictionaries to functions, default parameters, positional parameters, return values, functions using libraries: mathematical and string functions.
- File handling: Need for a data file, Types of file: Text files, Binary files and CSV (Comma separated values) files.

- Text File: Basic operations on a text file: Open (filename – absolute or relative path, mode), Close a text file, Reading and Manipulation of data from a text file, Appending data into a text file, standard input / output and error streams, relative and absolute paths.
- Binary File: Basic operations on a binary file: Open (filename – absolute or relative path, mode), Close a binary file, Pickle Module – methods load and dump; Read, Write/Create, Search, Append and Update operations in a binary file.
- CSV File: Import csv module, functions – Open, Close a csv file, Read from a csv file and Write into a csv file using csv.reader ( ) and csv.writerow( ).
- Using Python libraries: Import Python libraries.
- Data-structures: Lists as covered in Class XI, Stacks – Push, Pop using a list.

Unit II: Computer Networks

- Evolution of Networking: ARPANET, Internet, Interspace Different ways of sending data across the network with reference to switching techniques (Circuit and Packet switching).
- Data Communication terminologies: Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, Kbps, Mbps, Gbps, Tbps).
- Transmission media: Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link.
- Network devices: Modem, RJ45 connector, Ethernet Card, Router, Switch, Gateway, WiFi card.
- Network Topologies and types: Bus, Star, Tree, PAN, LAN, WAN, MAN.
- Network Protocol: TCP/IP, File Transfer Protocol (FTP), PPP, HTTP, SMTP, POP3, Remote Login (Telnet) and Internet, Wireless / Mobile Communication protocol such as GSM, GPRS and WLL.
- Mobile Telecommunication Technologies: 1G, 2G, 3G, 4G and 5G; Mobile processors;
  Electronic mail protocols such as SMTP, POP3, Protocols for Chat and Video Conferencing: VoIP, Wireless technologies such as Wi-Fi and WiMax
- Network Security Concepts:
  Threats and prevention from Viruses, Worms, Trojan horse, Spams
  Use of Cookies, Protection using Firewall, https;
  India IT Act, Cyber Law, Cyber Crimes, IPR issues, hacking.
- Introduction To Web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP); Domain Names; URL; Website, Web browser, Web

Servers; Web Hosting.

Unit III: Database Management

Database Concepts: Introduction to database concepts and its need.

Relational data model: Concept of domain, relation, tuple, attribute, degree, cardinality, key, primary key, candidate key, alternate key and foreign key;

Structured Query Language:

General Concepts: Advantages of using SQL, Data Definition Language and Data Manipulation Language;

Data Types: number / decimal, character / varchar / varchar2, date;

SQL commands **covered in class XI (2019-20)**

SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, LIKE, NULL / IS NULL, ORDER BY,GROUP BY, HAVING;

SQL functions: SUM ( ), AVG ( ), COUNT ( ), MAX ( ) and MIN ( );

Joins: equi-join and natural join

Interface of Python with an SQL database

- Connecting SQL with Python
- Creating Database connectivity Applications
- Performing Insert, Update, Delete queries
- Display data by using fetchone(),fetchall(),rowcount

4. Practical

S. No.	Area	Marks (Total=30)
1	**Lab Test:** 1. Python program (60% logic + 20% documentation + 20% code quality) 2. Small Python program that sends a SQL query to a database and displays the result. A stub program can be provided.	**7** **5**
2	**Report file:** Minimum 20 Python programs. Out of this at least 4 programs should send SQL commands to a database and retrieve the result	**7**
3	**Project** (that uses the concepts that have been learnt in Class 11 and 12)	**8**
4	**Viva voce**	**3**

5. Suggested Practical List:

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/ consonants/ uppercase/ lowercase characters in the file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Remove all the lines that contain the character `a' in a file and write it to another file.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Write a Python program to implement a stack and queue using a list data-structure.
- Take a sample of ten phishing e-mails (or any text file) and find most commonly occurring word(s)

Database Management

- Create a student table and insert data. Implement the following SQL commands on the student table:
  ALTER table to add new attributes / modify data type / drop attribute
  UPDATE table to modify data
  ORDER By to display data in ascending / descending order
  DELETE to remove tuple(s)
  GROUP BY and find the min, max, sum, count and average
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing the MySQL module.

6. Project

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

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

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

ECONOMICS (Code No. 030)
(2020-21)

Rationale

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:

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

ECONOMICS (030)
CLASS – XI (2020-21)

Theory: 80 Marks **3 Hours**
Project: 20 Marks

Units		Marks	Periods
Part A	**Statistics for Economics**		
	Introduction	13	07
	Collection, Organisation and Presentation of Data		27
	Statistical Tools and Interpretation	27	41
		40	**75**
Part B	**Introductory Microeconomics**		
	Introduction	4	4
	Consumer's Equilibrium and Demand	13	32
	Producer Behaviour and Supply	13	26
	Forms of Market and Price Determination under perfect competition with simple applications	10	13
		40	**75**
Part C	**Project Work**	**20**	**15**

Part A: Statistics for Economics

In this course, the learners are expected to acquire skills in collection, organisation and presentation of quantitative and qualitative information pertaining to various simple economic aspects systematically. It also intends to provide some basic statistical tools to analyse, and interpret any economic information and draw appropriate inferences. In this process, the learners are also expected to understand the behaviour of various economic data.

Unit 1: Introduction **07 Periods**

What is Economics?

Meaning, scope, functions and importance of statistics in Economics

Unit 2: Collection, Organisation and Presentation of data **27 Periods**

Collection of data - sources of data - primary and secondary; how basic data is collected with concepts of Sampling; methods of collecting data; some important sources of secondary data: Census of India and National Sample Survey Organisation.

Organisation of Data: Meaning and types of variables; Frequency Distribution.

Presentation of Data: Tabular Presentation and Diagrammatic Presentation of Data: (i) Geometric forms (bar diagrams and pie diagrams), (ii) Frequency diagrams (histogram, polygon and Ogive) and (iii) Arithmetic line graphs (time series graph).

Unit 3: Statistical Tools and Interpretation **41 Periods**

For all the numerical problems and solutions, the appropriate economic interpretation may be attempted. This means, the students need to solve the problems and provide interpretation for the results derived.

Measures of Central Tendency- Arithmatic mean, median and mode

Measures of Dispersion - absolute dispersion standard deviation); relative dispersion co-efficient of variation)

Correlation – meaning and properties, scatter diagram; Measures of correlation - Karl Pearson's method (two variables ungrouped data)

Introduction to Index Numbers - meaning, types - wholesale price index, consumer price index, uses of index numbers; Inflation and index numbers.

Part B: Introductory Microeconomics

Unit 4: Introduction **4 Periods**

Meaning of microeconomics and macroeconomics; positive and normative economics

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

Unit 5: Consumer's Equilibrium and Demand **32 Periods**

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 and its slope, movement along and shifts in the demand curve; price elasticity of demand - factors affecting price elasticity of demand; measurement of price elasticity of demand – percentage-change method.

Unit 6: Producer Behaviour and Supply **26 Periods**

Meaning of Production Function – Short-Run and Long-Run

Total Product, Average Product and Marginal Product.

Returns to a Factor

Cost: Short run costs - total cost, total fixed cost, total variable cost; Average cost; Average fixed cost, average variable cost and marginal cost-meaning and their relationships.

Revenue - total, average and marginal revenue - meaning and their relationship.

Supply, market supply, determinants of supply, supply schedule, supply curve and its slope, movements along and shifts in supply curve, price elasticity of supply; measurement of price elasticity of supply - percentage-change method.

Unit 7: Forms of Market and Price Determination under Perfect Competition with simple applications. **13 Periods**

Perfect competition - Features; Determination of market equilibrium and effects of shifts in demand and supply.

Simple Applications of Demand and Supply: Price ceiling, price floor.

Part C: Project in Economics 20 Periods

Guidelines as given in class XII curriculum

Suggested Question Paper Design
Economics (Code No. 030)
Class XI (2020-21)
March 2021 Examination

Marks: 80 **Duration: 3 hrs.**

SN	Typology of Questions	Marks	Percentage
1	**Remembering and Understanding**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55%
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	18	22.5%
3	**Analysing, Evaluating and Creating:** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	18	22.5%
	Total	**80**	**100%**

ECONOMICS
CLASS - XII (2020-21)

Theory: 80 Marks **3 Hours**
Project: 20 Marks

Units		Marks	Periods
Part A	**Introductory Macroeconomics**		
	National Income and Related Aggregates	10	23
	Money and Banking	6	8
	Determination of Income and Employment	12	22
	Government Budget and the Economy	6	15
	Balance of Payments	6	7
		40	**75**
Part B	**Indian Economic Development**		
	Development Experience (1947-90) and Economic Reforms since 1991	12	28
	Current Challenges facing Indian Economy	22	35
	Development Experience of India – A Comparison with Neighbours	06	12
	Theory Paper (40+40 = 80 Marks)	**40**	**75**
Part C	**Project Work**	**20**	**15**

Part A: Introductory Macroeconomics

Unit 1: National Income and Related Aggregates **23 Periods**

What is Macroeconomics?

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

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

Aggregates related to National Income:

Gross National Product (GNP), Net National Product (NNP), Gross Domestic Product (GDP) and Net Domestic Product (NDP) - at market price, at factor cost; Real and Nominal GDP.

GDP and Welfare

Unit 2: Money and Banking **8 Periods**

Money - meaning and supply of money - Currency held by the public and net demand deposits held by commercial banks.

Money creation by the commercial banking system.

Central bank and its functions (example of the Reserve Bank of India): Bank of issue, Govt. Bank, Banker's Bank, Control of Credit

Unit 3: Determination of Income and Employment **22 Periods**

Aggregate demand and its components.
Propensity to consume and propensity to save (average and marginal).
Short-run equilibrium output; investment multiplier and its mechanism.
Meaning of full employment and involuntary unemployment.

Problems of excess demand and deficient demand; measures to correct them - changes in government spending, taxes and money supply through Bank Rate, CRR, SLR, Repo Rate and Reverse Repo Rate, Open Market Operations, Margin requirement.

Unit 4: Government Budget and the Economy **15 Periods**

Government budget - meaning, objectives and components.

Classification of receipts - revenue receipts and capital receipts; classification of expenditure – revenue expenditure and capital expenditure.

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

Unit 5: Balance of Payments **7 Periods**

Balance of payments account - meaning and components;
Foreign exchange rate - meaning of fixed and flexible rates and managed floating.

Part B: Indian Economic Development

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

A brief introduction of the state of Indian economy on the eve of independence.
Indian economic system and common goals of Five Year Plans.

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

Economic Reforms since 1991:

Features and appraisals of liberalisation, globalisation and privatisation (LPG policy); Concepts of demonetization and GST

Unit 7: Current challenges facing Indian Economy **35 Periods**

Poverty- absolute and relative; Main programmes for poverty alleviation: A critical assessment;

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

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

Employment: Growth and changes in work force participation rate in formal and informal sectors; problems and policies

Infrastructure: Meaning and Types: Case Studies: Health: Problems and Policies- A critical assessment;

Sustainable Economic Development: Meaning, Effects of Economic Development on Resources and Environment, including global warming

Unit 8: Development Experience of India: **12 Periods**

A comparison with neighbours

India and Pakistan

India and China

Issues: economic growth, population, sectoral development and other Human Development Indicators

Part C: Project in Economics 15 Periods

Prescribed Books:

1. Statistics for Economics, NCERT
2. Indian Economic Development, NCERT
3. Introductory Microeconomics, NCERT
4. Macroeconomics, NCERT
5. Supplementary Reading Material in Economics, CBSE

Note: *The above publications are also available in Hindi Medium.*

Suggested Question Paper Design
Economics (Code No. 030)
Class XII (2020-21)
March 2021 Examination

Marks: 80 **Duration: 3 hrs.**

SN	Typology of Questions	Marks	Percentage
1	**Remembering and Understanding**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55%
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	18	22.5%
3	**Analysing, Evaluating and Creating:** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations. Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	18	22.5%
	Total	**80**	**100%**

Guidelines for Project Work in Economics (Class XI and XII)

The **objectives** of the project work are to enable learners to:

- probe deeper into theoretical concepts learnt in classes XI and XII
- analyse and evaluate real world economic scenarios using theoretical constructs and arguments
- demonstrate the learning of economic theory
- follow up aspects of economics in which learners have interest
- develop the communication skills to argue logically

The **expectations** of the project work are that:

- learners will complete only **ONE** project in each academic session
- project should be of 3,500-4,000 words (excluding diagrams & graphs), preferably hand-written
- it will be an independent, self-directed piece of study

Role of the teacher:

The teacher plays a critical role in developing thinking skills of the learners. A teacher should:

- help each learner select the topic based on recently published extracts from the news media, government policies, RBI bulletin, NITI Aayog reports, IMF/World Bank reports etc., after detailed discussions and deliberations of the topic
- play the role of a facilitator and supervisor to monitor the project work of the learner through periodic discussions
- guide the research work in terms of sources for the relevant data
- educate learner about plagiarism and the importance of quoting the source of the information to ensure authenticity of research work
- prepare the learner for the presentation of the project work
- arrange a presentation of the project file

Scope of the project:

Learners may work upon the following lines as a suggested flow chart:

Choose a title/topic

↓

Collection of the research material/data

↓

Organization of material/data

↓

Present material/data

↓

Analysing the material/data for conclusion

↓

Draw the relevant conclusion

↓

Presentation of the Project Work

Expected Checklist:

- Introduction of topic/title
- Identifying the causes, consequences and/or remedies
- Various stakeholders and effect on each of them
- Advantages and disadvantages of situations or issues identified
- Short-term and long-term implications of economic strategies suggested in the course of research
- Validity, reliability, appropriateness and relevance of data used for research work and for presentation in the project file
- Presentation and writing that is succinct and coherent in project file
- *Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.*

Mode of presentation/submission of the Project:

At the end of the stipulated term, each learner will present the research work in the Project File to the External and Internal examiner. **The questions should be asked from the Research Work/ Project File of the learner. The Internal Examiner should ensure that the study submitted by the learner is his/her own original work.** In case of any doubt, authenticity should be checked and verified.

Marking Scheme :

Marks are suggested to be given as –

S. No.	Heading	Marks Allotted
1.	Relevance of the topic	3
2.	Knowledge Content/Research Work	6
3.	Presentation Technique	3
4.	Viva-voce	8
	Total	20 Marks

Suggestive List of Projects:

Class XI	
• Effect on PPC due to various government policies	• Invisible Hand (Adam Smith)
• Opportunity Cost as an Economic Tool (taking real life situations)	• Effect of Price Change on a Substitute Good (taking prices from real life visiting local market)
• Effect on equilibrium Prices in Local Market (taking real life situation or recent news)	• Effect of Price Change on a Complementary Good (taking prices from real life visiting local market)
• Solar Energy, a Cost Effective Comparison with Conventional Energy Sources	• Bumper Production- Boon or Bane for the Farmer
• Any other newspaper article and its evaluation on basis of economic principles	• **Any other topic**

Class XII	
• Micro and Small Scale Industries	• Food Supply Channel in India
• Contemporary Employment situation in India	• Disinvestment policy of the government
• Goods and Services Tax Act and its Impact on GDP	• Health Expenditure (of any state)
• Human Development Index	• Inclusive Growth Strategy
• Self-help group	• Trends in Credit availability in India
• Monetary policy committee and its functions	• Role of RBI in Control of Credit
• Government Budget & its Components	• Trends in budgetary condition of India
• Exchange Rate determination – Methods and Techniques	• Currency War – reasons and repercussions
• Livestock – Backbone of Rural India	• Alternate fuel – types and importance
• Sarwa Siksha Abhiyan – Cost Ratio Benefits	• Golden Quadrilateral- Cost ratio benefit
• Minimum Support Prices	• Relation between Stock Price Index and Economic Health of Nation
• Waste Management in India – Need of the hour	• Minimum Wage Rate – approach and Application
• Digital India- Step towards the future	• Rain Water Harvesting – a solution to water crises
• Vertical Farming – an alternate way	• Silk Route- Revival of the past
• Make in India – The way ahead	• Bumper Production- Boon or Bane for the farmer
• Rise of Concrete Jungle- Trend Analysis	• Organic Farming – Back to the Nature
• Any other newspaper article and its evaluation on basis of economic principles	• **Any other topic**

ENGLISH (CORE)- 301

RATIONALISED CURRICULUM (2020-21)

Background

Students are expected to have acquired a reasonable degree of language proficiency in English Language by the time they come to class XI, and the course aims, essentially, at promoting the higher-order language skills.

For a large number of students, the higher secondary stage will be a preparation for the university, where a fairly high degree of proficiency in English may be required. But for another large group, the higher secondary stage may be a preparation for entry into the professional domain. The Core Course should cater to both groups by promoting the language skills required for academic study as well as the language skills required for the workplace.

Competencies to be focused on:

The general objectives at this stage are to:

- listen and comprehend live as well as record in writing oral presentations on a variety of topics
- develop greater confidence and proficiency in the use of language skills necessary for social and academic purpose to participate in group discussions, interviews by making short oral presentation on given topics
- perceive the overall meaning and organisation of the text (i.e., correlation of the vital portions of the text)
- identify the central/main point and supporting details, etc., to build communicative competence in various lexicons of English
- promote advanced language skills with an aim to develop the skills of reasoning, drawing inferences, etc. through meaningful activities
- translate texts from mother tongue(s) into English and vice versa
- develop ability and acquire knowledge required in order to engage in independent reflection and enquiry
- read and comprehend extended texts (prescribed and non-prescribed) in the following genres: science fiction, drama, poetry, biography, autobiography, travel and sports literature, etc.
- text-based writing (i.e., writing in response to questions or tasks based on prescribed or unseen texts) understand and respond to lectures, speeches, etc.

- write expository / argumentative essays, explaining or developing a topic, arguing a case, etc. write formal/informal letters and applications for different purposes
- make use of contextual clues to infer meanings of unfamiliar vocabulary
- select, compile and collate information for an oral presentation
- produce unified paragraphs with adequate details and support
- use grammatical structures accurately and appropriately
- write items related to the workplace (minutes, memoranda, notices, summaries, reports etc.
- filling up of forms, preparing CV, e-mail messages., making notes from reference materials, recorded talks etc.

The core course should draw upon the language items suggested for class IX-X and delve deeper into their usage and functions. Particular attention may, however, be given to the following areas of grammar:

- The use of passive forms in scientific and innovative writings.

- Convert one kind of sentence/clause into a different kind of structure as well as other items to exemplify stylistic variations in different discourses modal auxiliaries-uses based on semantic considerations.

A. Specific Objectives of Reading

Students are expected to develop the following study skills:

- skim for main ideas and scan for details

- refer to dictionaries, encyclopedia, thesaurus and academic reference material in any format

- select and extract relevant information, using reading skills of skimming and scanning

- understand the writer's purpose and tone

- comprehend the difference between the literal and the figurative

- differentiate between claims and realities, facts and opinions, form business opinions on the basis of latest trends available

- comprehend technical language as required in computer related fields, arrive at personal conclusion and logically comment on a given text.

- Specifically develop the ability to be original and creative in interpreting opinion, develop the ability to be logically persuasive in defending one's opinion and making notes based on a text.

Develop literary skills as enumerated below:

- respond to literary texts
- appreciate and analyse special features of languages that differentiate literary texts from non-literary ones, explore and evaluate features of character, plot, setting, etc.
- understand and appreciate the oral, mobile and visual elements of drama .Identify the elements of style such as humour, pathos, satire and irony, etc.
- make notes from various resources for the purpose of developing the extracted ideas into sustained pieces of writing

B. Listening and Speaking

Speaking needs a very strong emphasis and is an important objective leading to professional competence. Hence, testing of oral skills must be made an important component of the overall testing pattern. To this end, speaking and listening skills are overtly built into the material to guide the teachers in actualization of the skills.

I. Specific Objectives of Listening & Speaking

Students are expected to develop the ability to:

- take organized notes on lectures, talks and listening passages
- listen to news bulletins and to develop the ability to discuss informally a wide ranging issues like current national and international affairs, sports, business, etc.
- respond in interviews and to participate in formal group discussions.
- make enquiries meaningfully and adequately and to respond to enquiries for the purpose of travelling within the country and abroad.
- listen to business news and to be able to extract relevant important information.
- to develop public speaking skills.

II. Guidelines for Assessment in Listening and Speaking Skills

i. Activities:

- Activities for listening and speaking available at www.cbseacademic.in can be used for developing listening and speaking skills of students.

- Subject teachers should also refer to books prescribed in the syllabus.
- In addition to the above, teachers may plan their own activities and create their own material for assessing the listening and speaking skills.

ii. Parameters for Assessment:

The listening and speaking skills are to be assessed on the following parameters:

i. Interactive competence (Initiation & turn taking, relevance to the topic).
ii. Fluency (cohesion, coherence and speed of delivery).
iii. Pronunciation
iv. Language (accuracy and vocabulary).

iii. Schedule:

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

III. Record keeping:

The record of the activities done and the marks given must be kept for three months after the declaration of result, for any random checking by the Board.

No recording of speaking skills is to be sent to the Board.

C. Specific Objectives of Writing

The students will be able to:

- write letters to friends, relatives, etc. to write business and official letters.
- open accounts in post offices and banks. To fill in railway/airline reservation forms.
- draft notices, advertisements and design posters effectively and appropriately
- write on various issues to institutions seeking relevant information, lodge complaints, express gratitude or render apology.
- write applications, fill in application forms, prepare a personal bio-data for admission into colleges, universities, entrance tests and jobs.
- write informal reports as part of personal letters on functions, programmes and activities held in school (morning assembly, annual day, sports day, etc.)
- write formal reports for school magazines/events/processes/ or in local newspapers about events or occasions.
- express opinions, facts, arguments in the form of speech or debates, using a variety of accurate sentence structures
- draft papers to be presented in symposia.

- take down notes from talks and lectures.
- write examination answers according to the requirement of various subjects.
- summarise a text.

D. More About Reading

Inculcating good reading habits in children has always been a concern for all stakeholders in education. The purpose is to create independent thinking individuals with the ability to not only create their own knowledge but also critically interpret, analyse and evaluate it with objectivity and fairness. This will also help students in learning and acquiring better language skills.

Creating learners for the 21st century involves making them independent learners who can learn, unlearn and relearn. If our children are in the habit of reading, they will learn to reinvent themselves and deal with the many challenges that lie ahead of them.

Reading is not merely decoding information or pronouncing words correctly. It is an interactive dialogue between the author and the reader in which the reader and the author share their experiences and knowledge with each other. Good readers are critical readers with an ability to arrive at a deeper understanding of not only the world presented in the book but also of the real world around them.

Consequently, they become independent thinkers capable of taking their own decisions in life rationally. Hence, a few activities are suggested below which teachers may use as a part of the reading project.

- Short review / dramatization of the story
- Commentary on the characters
- Critical evaluation of the plot, storyline and characters
- Comparing and contrasting the characters within the story, with other characters in stories by the same author or by different authors
- Extrapolating about the story read or life of characters after the story ends defending characters actions in the story
- Making an audio story out of the novel/text to be read aloud.
- Interacting with the author
- Holding a literature fest where students role-play as various characters to interact with each other
- Role playing as authors/poets/dramatists, to defend their works and characters
- Symposiums and seminars for introducing a book, an author, or a theme
- Creating graphic novels out of novel or short stories they read
- Dramatizing incidents from a novel or a story

- Creating their own stories
- Books of one genre to be read by the whole class.

Teachers may select books and e-books suitable to the age and level of the learners. Care ought to be taken to choose books that are appropriate in terms of language, theme and content and which do not hurt the sensibilities of a child.

Teachers may later suggest books from other languages by dealing with the same themes as an extended activity. The Project should lead to independent learning/reading skills and hence the chosen book should not be taught in class, but may be introduced through activities and be left for the students to read at their own pace. Teachers may, however, choose to assess a student's progress or success in reading the book by asking for verbal or written progress reports, looking at their diary entries, engaging in a discussion about the book, giving a short quiz or a work sheet about the book/short story. A befitting mode of assessment may be chosen by the teacher.

Methods and Techniques

The techniques used for teaching should promote habits of self-learning and reduce dependence on the teacher. In general, we recommend a multi-skill, learner-centred, activity based approach, of which there can be many variations. The core classroom activity is likely to be that of silent reading of prescribed/selected texts for comprehension, which can lead to other forms of language learning activities such as role-play, dramatization, group discussion, writing, etc., although many such activities could be carried out without the preliminary use of textual material. It is important that students be trained to read independently and intelligently, interacting actively with texts, with the use of reference materials (dictionary, thesaurus, etc.) where necessary. Some pre-reading activity will generally be required, and the course books should suggest suitable activities, leaving teachers free to devise other activities when desired. So also, the reading of texts should be followed by post reading activities. It is important to remember that students should be encouraged to interpret texts in different ways.

Group and pair activities can be resorted to when desired, although many useful language activities can be carried out individually. In general, teachers should encourage students to interact actively with texts and with each other. Oral activity (group discussion, etc.) should be encouraged.

ENGLISH CORE (CODE NO. 301)

CLASS – XI (2020-21)

PART A - 40 MARKS

Reading **18 Marks**

I. Multiple Choice questions based on one unseen passage to assess comprehension, interpretation and inference. Vocabulary and inference of meaning will also be assessed. The passage may be factual, descriptive or literary. Ten out of eleven questions to be done. (**10x1**=**10 Marks)**

II. Multiple Choice questions based on one unseen **case-based** factual passage with verbal/visual inputs like statistical data, charts etc. Eight out of Nine questions to be done. (**8x1**=**8 Marks)**

Note: The combined word limit for both the passages will be 600-750.

Grammar **8 Marks**

III. Multiple choice questions on Gap filling (Determiners, Tenses)

IV. Multiple choice questions on re-ordering/transformation of sentences

(Total eight questions to be done out of the ten given).

Literature Section **14 Marks**

V. Multiple Choice questions from an extract from Poetry from **Hornbill** to assess comprehension and appreciation. Any 1 out of 2 extracts to be done.(3x1=3)

VI. Multiple Choice questions based on two Prose extracts, out of the three given, from Prose (**Hornbill as well as Snapshots** to assess comprehension and appreciation. (6x1=6)

VII. Text based Multiple Choice Questions to assess comprehension, analysis and interpretation, from Prose and Poetry. Five questions out of six to be done. (5x1=5)

PART B - 40 MARKS

Reading Section: **8 Marks**

Q1. Note Making and Summarization based on a passage of approximately 200-250 words.

I. Note Making: **5 Marks**
- Title: 1
- Numbering and indenting: 1
- Key/glossary: 1
- Notes: 2

II. Summary (up to 50 words): **3 Marks**
- Content: 1
- Expression: 1

Writing Section: **16 Marks**

Q2. Short writing task -**Notice** writing up to 50 words. One out of the two given questions to be answered **(3 Marks**: Format : 1 / Content : 1 / Expression : 1)

Q3. Short writing task –**Poster** up to 50 words. One out of the two given questions to be answered.(**3marks:**Format : 1 / Content : 1 / Expression : 1)

Q4. Letters based on verbal/visual input, to be answered in 120-150 words. Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies), letter to the school or college authorities, regarding admissions, school issues, requirements / suitability of courses, etc. One out of the two given questions to be answered (**5 Marks**: Format: 1 / Content: 2 / Expression: 2)

Q5 .Writing composition based on visual/verbal inputs in 120-150 words. May be descriptive / argumentative in nature such as **speech/debate**. The theme should be contemporary topical issues. One out of the two given questions to be answered. **(5 Marks**: Format: 1 / Content: 2 / Expression: 2)

Literature Section: **16 Marks**

Q6. **Two** Short answer type question**(one from Prose and one from Poetry from the book Hornbill), out of four,** to be answered in 30-40 words. Questions should elicit inferential responses through critical thinking. **(2x2=4)**

Q7. One Short answer type question, from **Prose (Snapshots),** to be answered in 40-50 words. Questions should elicit inferential responses through critical thinking. Any 1 out of 2 questions to be done. **(1x2=2)**

Q 8. One Long answer type question, from **Prose/poetry (Hornbill),** to be answered in 120-150 words to assess global comprehension and extrapolation beyond the text. Questions to provide evaluative and analytical responses using incidents, events, themes as reference points. Any 1 out of 2 questions to be done.**(1x5=5)**

Q.9 One Long answer type question, based on the chapters from the book **Snapshots**, to be answered in 120-150 words to assess global comprehension and extrapolation beyond the text. Questions to provide evaluative and analytical responses using incidents, events, themes as reference points. Any 1 out of 2 questions to be done.**(1x5=5)**

Deleted Topics

Writing

- **Classified Advertisements,**
- **Letters to the editor (giving suggestions/opinions on an issue) Provide realistic context in the form of newspaper report/article to which the students may respond.**
- **Application for a job with a bio-data or résumé**
- **Article & Report Writing**
- **Narrative**

Grammar

- **Modals**
- **Clauses**
- **Change of Voice**
- **Error Correction, editing task/cloze passages**

Literature

Hornbill

- ***Father To Son***
- ***The Adventure***

Snapshots

- ***The Ghat of the Only World***
- ***The Tale of Melon City***

Prescribed Books

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

2. Snapshots: Supplementary Reader published by National Council of Education Research and Training, New Delhi

Question Paper Design 2020-21

English CORE XI (Code No. 301)

Section	Competencies	Total marks	%
Reading Comprehension	Conceptual understanding, decoding, Analyzing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarizing and using appropriate format/s	26	32.5%
Creative Writing Skills and Grammar	Conceptual Understanding, application of rules, Analysis, Reasoning, appropriacy of style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity	24	30%
Literature Textbooks and Supplementary Reading Text	Recalling, reasoning, appreciating literary convention, inference, analysis, creativity with fluency	30	37.5%
	TOTAL	**80**	**100%**
Assessment of Listening and Speaking Skills		**20**	**-**
	GRAND TOTAL	**100**	

ENGLISH CORE (CODE NO. 301)

CLASS – XII 2020-21

PART A 40 MARKS

Reading Comprehension 20 Marks

I. Multiple Choice questions based on one unseen passage to assess comprehension, interpretation and inference. Vocabulary and inference of meaning will also be assessed. The passage may be factual, descriptive or literary. Ten out of eleven questions to be done. (**10x1**=**10 Marks)**

II. Multiple Choice questions based on one unseen **case-based** factual passage with verbal/visual inputs like statistical data, charts, newspaper report etc. Ten out of eleven questions to be done.(**10x1**=**10 Marks)**

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

Literature 20 Marks

III. Multiple Choice Questions based on two prose extracts, one each from the books **Flamingo and Vistas,** to assess comprehension and appreciation. Refer to the lines to answer questions based on the given extract. Any 2 out of 3extracts to be done.**(8x1=8)**

IV. Multiple Choice Questions based on a poetry extract from the book **Flamingo** to assess comprehension, analysis and inference. Refer to the lines to answer questions based on the given extract. Any 1 out of 2 extracts to be done.**(4x1=4)**

VI. Text based questions to assess comprehension, analysis, inference and interpretation from the books **Flamingo and Vistas**. Eight out of ten questions to be done.**(8x1=8)**

PART B (SUBJECTIVE QUESTIONS) - 40 MARKS

Writing Section: 16 Marks

Q1. Short writing task –Notice/Advertisement up to 50 words. One out of the two given questions to be answered.**(3 Marks**: Format : 1 / Content : 1 / Expression : 1).

Q2. Short writing task –Formal/Informal Invitation and Reply up to 50 words.One out of the two given questions to be answered.**(3 Marks**: Format : 1 / Content : 1 / Expression : 1)

Q3. Letters based on verbal/visual input, to be answered in approximately 120-150 words. Letter types include application for a job, Letters to the editor (giving suggestions or opinion on issues of public interest) . One out of the two given questions to be answered (**5 Marks** :Format: 1 / Content: 2 / Expression: 2)

Q4. Article/ Report Writing, descriptive and analytical in nature, based on verbal inputs, to be answered in 120-150 words. One out of the two given questions to be answered **(5Marks:**Format : 1 / Content : 2 / Expression : 2)

Literature Section: 24 Marks

Q6. **Five** Short answer type question, **out of six, from Prose and Poetry from the book Flamingo,** to be answered in 30-40 words. Questions should elicit inferential responses through critical thinking.**(5x2=10)**

Q7. **Two** Short answer type question ,out of three, from **Prose (Vistas),** to be answered in 30-40 words. Questions should elicit inferential responses through critical thinking. **(2x2=4)**

Q 8. **One** Long answer type question, from **Prose/poetry (Flamingo),** to be answered in 120-150 words to assess global comprehension and extrapolation beyond the text. Questions to provide evaluative and analytical responses using incidents, events, themes as reference points. Any 1 out of 2 questions to be done.**(1x5=5)**

Q.9 One Long answer type question, based on the chapters from the book **Vistas**, to be answered in 120-150 words to assess global comprehension and extrapolation beyond the text. Questions to provide evaluative and analytical responses using incidents, events, themes as reference points. Any 1 out of 2 questions to be done.**(1x5=5)**

Prescribed Books

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

Deleted Topics

Reading

Note Making & Summarizing

Literature

FLAMINGO

1. Poets and Pancakes
2. The Interview
3. Going Places

1. A Roadside Stand

VISTAS

1. The Tiger King
2. Journey to the end of the Earth
3. Memories of Childhood

Writing

- Poster making
- Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies)
- Speech, Debate

Question Paper Design 2020-21

English CORE XII (Code No. 301)

Section	**Competencies**	**Total marks**	**%**
Reading Comprehension	Conceptual understanding, decoding, Analyzing, inferring, interpreting, appreciating, literary, conventions and vocabulary, summarizing and using appropriate format/s	20	25%
Creative Writing Skills	Conceptual Understanding, application of rules, Analysis, Reasoning, appropriacy of style and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity	16	20%
Literature Textbooks and Supplementary Reading Text	Recalling, reasoning, appreciating literary convention, inference, analysis, creativity with fluency	44	55%
	TOTAL	**80**	**100%**
Assessment of Listening and Speaking Skills		**20**	**-**
	GRAND TOTAL	**100**	

GEOGRAPHY
XI-XII (2020-21)
(Code No. 029)

Geography is introduced as an elective subject at the senior secondary stage. After ten years of general education, students branch out at the beginning of this stage and are exposed to the rigors of the discipline for the first time. Being an entry point for the higher education, students choose Geography for pursuing their academic interest and, therefore, need a broader and deeper understanding of the subject. For others, geographical knowledge is useful in daily lives because it is a valuable medium for the education of young people. Its contribution lies in the content, cognitive processes, skills and values that Geography promotes and thus helps the students explore, understand and evaluate the environmental and social dimensions of the world in a better manner.

Since Geography explores the relationship between people and their environment, it includes studies of physical and human environments and their interactions at different scales-local, state/region, nation and the world. The fundamental principles responsible for the varieties in the distributional pattern of physical and human features and phenomena over the earth's surface need to be understood properly. Application of these principles would be taken up through selected case studies from the world and India. Thus, the physical and human environment of India and study of some issues from a geographical point of view will be covered in greater detail. Students will be exposed to different methods used in geographical investigations.

Objectives:

The course in Geography will help learners to:

- Familiarize with key concepts, terminology and core principles of Geography.
- Describe locations and correlate with Geographical Perspectives.
- List/describe what students might see, hear, and smell at a place.
- List/describe ways a place is linked with other places.
- Compare conditions and connections in one place to another.
- Analyze/describe how conditions in one place can affect nearby places.
- Identify regions as places that are similar or connected.
- Describe and interpret the spatial pattern features on a thematic map.
- Search for, recognize and understand the processes and patterns of the spatial arrangement of the natural features as well as human aspects and phenomena on the earth's surface.
- Understand and analyze the inter-relationship between physical and human environments and utilize such knowledge in reflecting on issues related to community.
- Apply geographical knowledge and methods of inquiry to emerging situations or problems at different levels-local, regional, national and global.

- Develop geographical skills, relating to collection, processing and analysis of spatial data/ information and preparation of report including maps and graphs and use of computers where ever possible; and to be sensitive to issues.
- The child will develop the competency to analyze, evaluate, interpret and apply the acquired knowledge to determine the environmental issues effectively.

COURSE STRUCTURE
CLASS XI (2020-21)

One Theory Paper **70Marks**
3Hours

Part	Units	Marks
A	**Fundamentals of Physical Geography**	**35 Marks**
	Unit-1: Geography as a discipline	**30**
	Unit-2: The Earth	
	Unit-3: Landforms	
	Unit-4: Climate	
	Unit-5: Water (Oceans)	
	Unit-6: Life on the Earth	
	Map and diagram	**5**
B	**India-Physical Environment**	**35 Marks**
	Unit-1: Introduction	**30**
	Unit-2: Physiography	
	Unit-3: Climate, vegetation and soil	
	Map and Diagram	**5**
	Total	**70 Marks**
C	**Practical Work in Geography Part I**	**30 Marks**
	Unit-1: Fundamentals of Maps	**15 Marks**
	Unit-2: Topographic and Weather Maps	**10 Marks**
	Practical Record Book and Viva	**5 Marks**

COURSE CONTENT

Part A:	Fundamentals of Physical Geography
Unit 1:	**Geography as a Discipline** • Geography as an integrating discipline, as a science of spatial attributes • Branches of Geography: Physical Geography and Human Geography • Scope and Career Options (Non-evaluative)
Unit 2:	**The Earth** • Interior of the earth • Wegener's continental drift theory and plate tectonics • Earthquakes and volcanoes: causes, types and effects
Unit 3:	**Landforms** • Rocks: major types of rocks and their characteristics • Geomorphic processes: weathering; mass wasting; erosion and deposition; soil-formation
Unit 4:	**Climate** • Atmosphere- composition and structure; elements of weather and climate • Insolation-angle of incidence and distribution; heat budget of the earth-heating and cooling of atmosphere (conduction, convection, terrestrial radiation and advection); temperature- factors controlling temperature; distribution of temperature-horizontal and vertical; inversion of temperature • Precipitation-evaporation; condensation-dew, frost, fog, mist and cloud; rainfall-types and world distribution
Unit 5:	**Water (Oceans)** • Movements of ocean water-waves, tides and currents.

Unit 6:	**Life on the Earth** • Biosphere - importance of plants and other organisms; biodiversity and conservation; ecosystem and ecological balance
Map work on identification of features based on 1 to 6 units on the outline Physical/Political map of the world.	
Part B:	**India-Physical Environment**
Unit 1:	**Introduction** • Location, space relations, India's place in the world
Unit 2:	**Physiography** • Drainage systems: Concept of river basins, watershed; the Himalayan and the Peninsular rivers
Unit 3:	**Climate, Vegetation and Soil** • Natural vegetation-forest types and distribution; wild life; conservation; biosphere reserves • Soils - major types (ICAR's classification) and their distribution, soil degradation and conservation
Map Work of features based on above units for locating and labeling on the outline Political/Physical map of India	
Part C:	**Practical Work in Geography Part I**
Unit 1:	**Fundamentals of Maps** • Geo spatial data, Concept of Geographical data matrix; Point, line, area data • Maps -types; scales-types; construction of simple linear scale, measuring distance; finding direction and use of symbols

Unit 2:	**Topographic and Weather Maps** ▯ Aerial Photographs: Types and Geometry-vertical aerial photographs; difference between maps and aerial photographs; photo scale determination. Identification of physical and cultural features ▯ Satellite imageries, stages in remote sensing data-acquisition, platform and sensors and data products, (photographic and digital) ▯ Use of weather instruments: thermometer, wet and dry-bulb thermometer, barometer, wind vane, rain gauge
	Practical Record Book and Viva Voce **Viva to be based on Practical Unit I and II only.**

COURSE STRUCTURE

Class XII (2020-21)

One Theory Paper **3Hours**
70 Marks

Part	Units	Marks
A	**Fundamentals of Human Geography**	**35 Marks**
	Unit 1: Human Geography	**30**
	Unit 2: People	
	Unit 3: Human Activities	
	Unit 4: Human settlements	
	Map Work	**5**
B	**India: People and Economy**	**35 Marks**
	Unit 1: People	**30**
	Unit 2: Human Settlements	
	Unit 3: Resources and Development	
	Unit 5: Geographical Perspective on selected issues and problems	
	Map Work	**5**
	Total	**70 Marks**
C	**Practical Work in Geography Part II**	**30 Marks**
	Unit 1: Processing of Data and Thematic Mapping	**25**
	Practical Record Book and Viva Voce	**5**

COURSE CONTENT

Part A:	**Fundamentals of Human Geography**
Unit 1:	**Human Geography:** Nature and Scope
Unit 2:	**People** ▯ Population-distribution, density and growth ▯ Population change-spatial patterns and structure; determinants of population change ▯ Population Composition - age-sex pyramid; rural-urban composition ▯ Human development - concept; selected indicators, international comparisons

Unit 3:	**Human Activities** ▯ Primary activities - concept and changing trends; gathering, pastoral, mining, subsistence agriculture, modern agriculture; people engaged in agricultural and allied activities - some examples from selected countries ▯ Tertiary activities-concept; trade, transport and tourism; services; people engaged in tertiary activities - some examples from selected countries ▯ Quaternary activities-concept; people engaged in quaternary activities - case study from selected countries
Unit 4:	**Human Settlements** ▯ Settlement types - rural and urban; morphology of cities (case study); distribution of mega cities; problems of human settlements in developing countries
Map Work on identification of features based on 1-5 units on the outline Physical/Political map of World.	
Part B:	**India: People and Economy**
Unit 1:	**People** ▯ Population: distribution, density and growth; composition of population - linguistic, religious; sex, rural-urban and occupational-regional variations in growth of population ▯ Migration: international, national-causes and consequences ▯ Human development: selected indicators and regional patterns ▯ Population, environment and development
Unit 2:	**Human Settlements** ▯ Rural settlements - types and distribution ▯ Urban settlements - types, distribution and functional classification
Unit 3:	**Resources and Development** ▯ Water resources-availability and utilization-irrigation, domestic, industrial and other uses; scarcity of water and conservation methods-rain water harvesting and watershed management

	▯ Mineral and energy resources- distribution of metallic (Iron ore, Copper, Bauxite, Manganese); non-metallic (Mica, Salt) minerals; conventional (Coal, Petroleum, Natural gas and Hydroelectricity) and non-conventional energy sources (solar, wind, biogas) and conservation ▯ Planning in India- target group area planning (case study); idea of sustainable development (case study)
Unit 5:	**Geographical Perspective on selected issues and problems** ▯ Environmental pollution; urban-waste disposal ▯ Urbanization, rural-urban migration; problems of slums ▯ Land degradation
Map work on locating and labeling of features based on above units on outline map of India.	
Part C:	**Practical Work in Geography Part II**
Unit 1:	**Processing of Data and Thematic Mapping** ▯ Type and Sources of data: Primary, Secondary and other sources ▯ Tabulating and processing of data; calculation of averages, measures of central tendency ▯ Representation of data- construction of diagrams: bars, circles and flowchart; thematic maps; construction of dot; choropleth and isopleths maps ▯ Data analysis and generation of diagrams, graphs and other visual diagrams using computers

Prescribed Books:

1. Fundamentals of Physical Geography, Class XI, Published byNCERT
2. India, Physical Environment, Class XI, Published byNCERT
3. Practical Work in Geography Part I, Class XI, Published byNCERT
4. Fundamentals of Human Geography, Class XII, Published byNCERT
5. India - People and Economy, Class XII, Published byNCERT
6. Practical Work in Geography Part II, Class XII, Published byNCERT

Note: The above textbooks are also available in Hindi medium.

QUESTION PAPER DESIGN GEOGRAPHY THEORY CLASS XI & XII

COMPETENCIES	Total Marks and % 70 Marks
DEMONSTRATE	29marks- 41%
APPLICATION	26marks - 37%
FORMULATE	15marks – 22%
TOTAL	70marks – 100%

Fundamentals of Human Geography
Class XII - Textbook I (NCERT)
Map Items for identification only on outline political map of the World.

Unit-1	Ch.-1	Nil	
Unit-2	Ch. 2 to 4	1	The largest country in each continent in terms of area
Unit-3	Ch. 5 to 7	1	Areas of subsistence gathering
	Primary Activities	2	Major areas of nomadic herding of the world
		3	Major areas of commercial livestock rearing
		4	Major areas of extensive commercial grain faming
		5	Major areas of mixed farming of the World
Unit - 5	Ch. 10		Mega cities of the world – Tokyo, Delhi, Shanghai, Mumbai, Sao Paulo

India - People and Economy
Class XII-Textbook II (NCERT)
Map Items for locating and labeling only on the outline political map of India

Units - 1 & 2	Ch. 1 to 4	• State with highest level of urbanization and lowest level of urbanization • One state with highest level of HDI & One lowest level of HDI • State with highest level of population density & one state with lowest level of population density (2011) • Any city with more than 10 million population – Greater Mumbai, Delhi, Kolkata, Chennai, Bengaluru
Unit - 3	Ch. 5 to 9	Leading producing states of the following crops: (a) Rice (b) Wheat (c) Cotton (d) Jute (e) Sugarcane (f) Tea and (g) Coffee **Mines:** • Iron-ore mines: Mayurbhanj, Bailadila, Ratnagiri, Bellary • Manganese mines: Balaghat, Shimoga • Copper mines: Hazaribagh, Singhbhum, Khetari • Bauxite mines: Katni, Bilaspur and Koraput • Coal mines: Jharia, Bokaro, Raniganj, Neyveli • Oil Refineries: Mathura, Jamnager, Barauni

हिंदी (आधार) (कोड सं.– 302)

कक्षा 11वीं–12वीं (2020-21)

प्रस्तावना:

दसवीं कक्षा तक हिंदी का अध्ययन करने वाला विद्यार्थी समझते हुए पढ़ने व सुनने के साथ-साथ हिंदी में सोचने और उसे मौखिक एवं लिखित रूप में व्यक्त कर पाने की सामान्य दक्षता अर्जित कर चुका होता है। उच्चतर माध्यमिक स्तर पर आने के बाद इन सभी दक्षताओं को सामान्य से ऊपर उस स्तर तक ले जाने की आवश्यकता होती है, जहाँ भाषा का प्रयोग भिन्न-भिन्न व्यवहार-क्षेत्रों की मांगों के अनुरूप किया जा सके। आधार पाठ्यक्रम, साहित्यिक बोध के साथ-साथ भाषाई दक्षता के विकास को ज्यादा महत्त्व देता है। यह पाठ्यक्रम उन विद्यार्थियों के लिए उपयोगी साबित होगा, जो आगे विश्वविद्यालय में अध्ययन करते हुए हिंदी को एक विषय के रूप में पढ़ेंगे या विज्ञान/सामाजिक विज्ञान के किसी विषय को हिंदी माध्यम से पढ़ना चाहेंगे। यह उनके लिए भी उपयोगी साबित होगा, जो उच्चतर माध्यमिक स्तर की शिक्षा के बाद किसी तरह के रोज़गार में लग जाएंगे। वहाँ कामकाजी हिंदी का आधारभूत अध्ययन काम आएगा। जिन विद्यार्थियों की रुचि जनसंचार माध्यमों में होगी, उनके लिए यह पाठ्यक्रम एक आरंभिक पृष्ठभूमि निर्मित करेगा। इसके साथ ही यह पाठ्यक्रम सामान्य रूप से तरह-तरह के साहित्य के साथ विद्यार्थियों के संबंध को सहज बनाएगा। विद्यार्थी भाषिक अभिव्यक्ति के सूक्ष्म एवं जटिल रूपों से परिचित हो सकेंगे। वे यथार्थ को अपने विचारों में व्यवस्थित करने के साधन के तौर पर भाषा का अधिक सार्थक उपयोग कर पाएँगे और उनमें जीवन के प्रति मानवीय संवेदना एवं सम्यक् दृष्टि का विकास हो सकेगा।

उद्देश्य:

- संप्रेषण के माध्यम और विधाओं के लिए उपयुक्त भाषा प्रयोग की इतनी क्षमता उनमें आ चुकी होगी कि वे स्वयं इससे जुड़े उच्चतर पाठ्यक्रमों को समझ सकेंगे।
- भाषा के अंदर सक्रिय सत्ता संबंध की समझ।
- सृजनात्मक साहित्य की समझ और आलोचनात्मक दृष्टि का विकास।
- विद्यार्थियों के भीतर सभी प्रकार की विविधताओं (धर्म, जाति, लिंग, क्षेत्र एवं भाषा संबंधी) के प्रति सकारात्मक एवं विवेकपूर्ण रवैये का विकास।
- पठन-सामग्री को भिन्न-भिन्न कोणों से अलग-अलग सामाजिक, सांस्कृतिक चिंताओं के परिप्रेक्ष्य में देखने का अभ्यास करवाना तथा आलोचनात्मक दृष्टि का विकास करना।
- विद्यार्थी में स्तरीय साहित्य की समझ और उसका आनंद उठाने की क्षमता तथा साहित्य को श्रेष्ठ बनाने वाले तत्वों की संवेदना का विकास।
- विभिन्न ज्ञानानुशासनों के विमर्श की भाषा के रूप में हिंदी की विशिष्ट प्रकृति और उसकी क्षमताओं का बोध।
- कामकाजी हिंदी के उपयोग के कौशल का विकास।
- जनसंचार माध्यमों (प्रिंट और इलेक्ट्रॉनिक) में प्रयुक्त हिंदी की प्रकृति से परिचय और इन माध्यमों की आवश्यकता के अनुरूप मौखिक एवं लिखित अभिव्यक्ति का विकास।
- विद्यार्थी में किसी भी अपरिचित विषय से संबंधित प्रासंगिक जानकारी के स्रोतों का अनुसंधान और व्यवस्थित ढंग से उनकी मौखिक और लिखित प्रस्तुति की क्षमता का विकास।

शिक्षण-युक्तियाँ:

- कुछ बातें इस स्तर पर हिंदी शिक्षण के लक्ष्यों के संदर्भ में सामान्य रूप से कही जा सकती हैं। एक तो यह है कि कक्षा में दबाव एवं तनाव मुक्त माहौल होने की स्थिति में ही ये लक्ष्य हासिल किए जा सकते हैं।

चूँकि इस पाठ्यक्रम में तैयारशुदा उत्तरों को कंठस्थ कर लेने की कोई अपेक्षा नहीं है, इसलिए विषय को समझने और उस समझ के आधार पर उत्तर को शब्दबद्ध करने की योग्यता विकसित करना ही शिक्षक का काम है। इस योग्यता के विकास के लिए कक्षा में विद्यार्थियों और शिक्षिका के बीच निर्बाध संवाद जरूरी है। विद्यार्थी अपनी शंकाओं और उलझनों को जितना ही अधिक व्यक्त करेंगे, उतनी ही ज़्यादा स्पष्टता उनमें आ पाएगी।

- भाषा की कक्षा से समाज में मौजूद विभिन्न प्रकार के द्वंद्वों पर बातचीत का मंच बनाना चाहिए। उदाहरण के लिए संविधान में किसी शब्द विशेष के प्रयोग पर निषेध को चर्चा का विषय बनाया जा सकता है। यह समझ जरूरी है कि विद्यार्थियों को सिर्फ सकारात्मक पाठ देने से काम नहीं चलेगा बल्कि उन्हें समझाकर भाषिक यथार्थ का सीधे सामना करवाने वाले पाठों से परिचय होना जरूरी है।
- शंकाओं और उलझनों को रखने के अलावा भी कक्षा में विद्यार्थियों को अधिक-से-अधिक बोलने के लिए प्रेरित किया जाना जरूरी है। उन्हें यह अहसास कराया जाना चाहिए कि वे पठित सामग्री पर राय देने का अधिकार और ज्ञान रखते हैं। उनकी राय को प्राथमिकता देने और उसे बेहतर तरीके से पुनः प्रस्तुत करने की अध्यापकीय शैली यहाँ बहुत उपयोगी होगी।
- विद्यार्थियों को संवाद में शामिल करने के लिए यह भी जरूरी होगा कि उन्हें एक नामहीन समूह न मानकर अलग-अलग व्यक्तियों के रूप में अहमियत दी जाए। शिक्षकों को अक्सर एक कुशल संयोजक की भूमिका में स्वयं देखना होगा, जो किसी भी इच्छुक व्यक्ति को संवाद का भागीदार बनने से वंचित नहीं रखते, उसके कच्चे-पक्के वक्तव्य को मानक भाषा-शैली में ढाल कर उसे एक आभा दे देते हैं और मौन को अभिव्यंजना मान बैठे लोगों को मुखर होने पर बाध्य कर देते हैं।
- अप्रत्याशित विषयों पर चिंतन तथा उसकी मौखिक व लिखित अभिव्यक्ति की योग्यता का विकास शिक्षकों के सचेत प्रयास से ही संभव है। इसके लिए शिक्षकों को एक निश्चित अंतराल पर नए-नए विषय प्रस्तावित कर उनपर लिखने तथा संभाषण करने के लिए पूरी कक्षा को प्रेरित करना होगा। यह अभ्यास ऐसा है, जिसमें विषयों की कोई सीमा तय नहीं की जा सकती। विषय की असीम संभावना के बीच शिक्षक यह सुनिश्चित कर सकते हैं कि उसके विद्यार्थी किसी निबंध-संकलन या कुंजी से तैयारशुदा सामग्री को उतार भर न ले। तैयार शुदा सामग्री के लोभ से, बाध्यतावश ही सही मुक्ति पाकर विद्यार्थी नये तरीके से सोचने और उसे शब्दबद्ध करने के लिए तैयार होंगे। मौखिक अभिव्यक्ति पर भी विशेष ध्यान देने की जरूरत है, क्योंकि भविष्य में साक्षात्कार, संगोष्ठी जैसे मौकों पर यही योग्यता विद्यार्थी के काम आती है। इसके अभ्यास के सिलसिले में शिक्षकों को उचित हावभाव, मानक उच्चारण, पॉज, बलाघात, हाजिरजवाबी इत्यादि पर खास बल देना होगा।
- काव्य की भाषा के मर्म से विद्यार्थी का परिचय कराने के लिए जरूरी होगा कि किताबों में आए काव्यांशों की लयबद्ध प्रस्तुतियों के ऑडियो-वीडियो कैसेट तैयार किए जाएँ। अगर आसानी से कोई गायक/गायिका मिले तो कक्षा में मध्यकालीन साहित्य के शिक्षण में उससे मदद ली जानी चाहिए।
- एन सी ई आर टी, मानव संसाधन विकास मंत्रालय के विभिन्न संगठनों तथा स्वतंत्र निर्माताओं द्वारा उपलब्ध कराए गए कार्यक्रम/ई-सामग्री,वृत्तचित्रों और सिनेमा को शिक्षण सामग्री के तौर पर इस्तेमाल करने की जरूरत है। इनके प्रदर्शन के क्रम में इन पर लगातार बातचीत के जरिए सिनेमा के माध्यम से भाषा के प्रयोग की विशिष्टता की पहचान कराई जा सकती है और हिंदी की अलग-अलग छटा दिखाई जा सकती है। विद्यार्थियों को स्तरीय परीक्षा करने को भी कहा जा सकता है।
- कक्षा में सिर्फ एक पाठ्यपुस्तक की उपस्थिति से बेहतर यह है कि शिक्षक के हाथ में तरह-तरह की पाठ्यसामग्री को विद्यार्थी देख सकें और शिक्षक उनका कक्षा में अलग-अलग मौकों पर इस्तेमाल कर सके।
- भाषा लगातार ग्रहण करने की क्रिया में बनती है, इसे प्रदर्शित करने का एक तरीका यह भी है कि शिक्षक खुद यह सिखा सकें कि वे भी शब्दकोश, साहित्यकोश, संदर्भग्रंथ की लगातार मदद ले रहे हैं। इससे विद्यार्थियों में इसका इस्तेमाल करने को लेकर तत्परता बढ़ेगी। अनुमान के आधार पर निकटतम अर्थ तक पहुँचकर संतुष्ट होने की जगह वे सही अर्थ की खोज करने के लिए प्रेरित होंगे। इससे शब्दों की

अलग-अलग रंगत का पता चलेगा और उनमें संवेदनशीलता बढ़ेगी। वे शब्दों के बारीक अंतर के प्रति और सजग हो पाएँगे।

- कक्षा-अध्यापन के पूरक कार्य के रूप में सेमिनार, ट्यूटोरियल कार्य, समस्या-समाधान कार्य, समूहचर्चा, परियोजना कार्य, स्वाध्याय आदि पर बल दिया जाना चाहिए। पाठ्यक्रम में जनसंचार माध्यमों से संबंधित अंशों को देखते हुए यह जरूरी है कि समय-समय पर इन माध्यमों से जुड़े व्यक्तियों और विशेषज्ञों को भी विद्यालय में बुलाया जाए तथा उनकी देख-रेख में कार्यशालाएँ आयोजित की जाएं।
- भिन्न क्षमता वाले विद्यार्थियों के लिए उपयुक्त शिक्षण सामग्री का इस्तेमाल किया जाए तथा उन्हें किसी भी प्रकार से अन्य विद्यार्थियों से कमतर या अलग न समझा जाए।
- कक्षा में शिक्षक को हर प्रकार की विविधताओं(लिंग जाति, धर्म, वर्ग आदि) के प्रति सकारात्मक और संवेदनशील वातावरण निर्मित करना चाहिए।

<u>आंतरिक मूल्यांकन हेतु</u> –

श्रवण तथा वाचन परीक्षा हेतु दिशा-निर्देश

- **श्रवण (सुनना) (5अंक)**: वर्णित या पठित सामग्री को सुनकर अर्थग्रहण करना, वार्तालाप करना, वाद-विवाद, भाषण, कवितापाठ आदि को सुनकर समझना, मूल्यांकन करना और अभिव्यक्ति के ढंग को समझना।
- **वाचन (बोलना) (5अंक)**: भाषण, सस्वर कविता-पाठ, वार्तालाप और उसकी औपचारिकता, कार्यक्रम-प्रस्तुति, कथा-कहानी अथवा घटना सुनाना, परिचय देना, भावानुकूल संवाद-वाचन।

टिप्पणी: *वार्तालाप की दक्षताओं का मूल्यांकन निरंतरता के आधार पर परीक्षा के समय ही होगा। निर्धारित 10 अंकों में से 5 श्रवण (सुनना) कौशल के मूल्यांकन के लिए और 5 वाचन (बोलना) कौशल के मूल्यांकन के लिए होंगे।*

वाचन (बोलना) एवं श्रवण (सुनना) कौशल का मूल्यांकन:

- परीक्षक किसी प्रासंगिक विषय पर एक अनुच्छेद का स्पष्ट वाचन करेगा। अनुच्छेद तथ्यात्मक या सुझावात्मक हो सकता है। अनुच्छेद लगभग 250 शब्दों का होना चाहिए।

या

- परीक्षक 2-3 मिनट का श्रव्य अंश (ऑडियो क्लिप) सुनवाएगा। अंश रोचक होना चाहिए। कथ्य/ घटना पूर्ण एवं स्पष्ट होनी चाहिए। वाचक का उच्चारण शुद्ध, स्पष्ट एवं विराम चिह्नों के उचित प्रयोग सहित होना चाहिए।
- परीक्षार्थी ध्यानपूर्वक परीक्षक/ऑडियो क्लिप को सुनने के पश्चात परीक्षक द्वारा पूछे गए प्रश्नों का अपनी समझ से मौखिक उत्तर देंगे। (1x5 =5)
- किसी निर्धारित विषय पर बोलना: जिससे विद्यार्थी अपने व्यक्तिगत अनुभवों का प्रत्यास्मरण कर सकें।
- कोई कहानी सुनाना या किसी घटना का वर्णन करना।
- परिचय देना। (स्व/ परिवार/ वातावरण/ वस्तु/ व्यक्ति/ पर्यावरण/ कवि /लेखक आदि)
- परीक्षण से पूर्व परीक्षार्थी को तैयारी के लिए कुछ समय दिया जाए।
- विवरणात्मक भाषा में वर्तमान काल का प्रयोग अपेक्षित है।
- निर्धारित विषय परीक्षार्थी के अनुभव-जगत के हों।
- जब परीक्षार्थी बोलना आरंभ करें तो परीक्षक कम से कम हस्तक्षेप करें।

कौशलों के अंतरण का मूल्यांकन

(इस बात का निश्चय करना कि क्या विद्यार्थी में श्रवण और वाचन की निम्नलिखित योग्यताएँ हैं)

क्र. सं.	**श्रवण (सुनना)**		**वाचन (बोलना)**
1	परिचित संदर्भों में प्रयुक्त शब्दों और पदों को समझने की सामान्य योग्यता है।	1	केवल अलग-अलग शब्दों और पदों के प्रयोग की योग्यता प्रदर्शित करता है।
2	छोटे सुसंबद्ध कथनों को परिचित संदर्भों में समझने की योग्यता है।	2	परिचित संदर्भों में केवल छोटे संबद्ध कथनों का सीमित शुद्धता से प्रयोग करता है।
3	परिचित या अपरिचित दोनों संदर्भों में कथित सूचना को स्पष्ट समझने की योग्यता है।	3	अपेक्षाकृत दीर्घ भाषण में जटिल कथनों के प्रयोग की योग्यता प्रदर्शित करता है।
4	दीर्घ कथनों की शृंखला को पर्याप्त शुद्धता से समझने के ढंग और निष्कर्ष निकाल सकने की योग्यता है।	4	अपरिचित स्थितियों में विचारों को तार्किक ढंग से संगठित कर धारा-प्रवाह रूप में प्रस्तुत करता है।
5	जटिल कथनों के विचार-बिंदुओं को समझने की योग्यता प्रदर्शित करने की क्षमता है।	5	उद्देश्य और श्रोता के लिए उपयुक्त शैली को अपना सकता है।

- **परियोजना कार्य - कुल अंक 10**

· विषय वस्तु - 5 अंक
· भाषा एवं प्रस्तुति - 3 अंक
· शोध एवं मौलिकता - 2 अंक

- हिन्दी भाषा और साहित्य से जुड़े विविध विषयों/ विधाओं / साहित्यकारों / समकालीन लेखन / साहित्यिक वादों / भाषा के तकनीकी पक्ष / प्रभाव / अनुप्रयोग / साहित्य के सामाजिक संदर्भो एवं जीवन मूल्य संबंधी प्रभावों आदि पर परियोजना कार्य दिए जाने चाहिए।
- सत्र के प्रारंभ में ही विद्यार्थी को विषय चुनने का अवसर मिले ताकि उसे शोध, तैयारी और लेखन के लिए पर्याप्त समय मिल सके ।

➢ **वाचन -श्रवण कौशल एवं परियोजना कार्य का मूल्यांकन विद्यालय स्तर पर आंतरिक परीक्षक द्वारा ही किया जाएगा।**

हिंदी (आधार) (कोड सं. 302)

कक्षा –11वीं (2020-21)

खंड		विषय	अंक
(क)	**अपठित अंश**		**15**
	1	अपठित गद्यांश – बोध (गद्यांश पर आधारित बोध, प्रयोग, रचनांतरण, शीर्षक आदि पर 10 बहुविकल्पी/अतिलघुत्तरात्मकक प्रश्न 1 अंक (1अंक x 10 प्रश्न)	10
	2	अपठित काव्यांश पर आधारित बोध (गद्यांश पर आधारित बोध, प्रयोग, रचनांतरण, शीर्षक आदि पर 5 बहुविकल्पी/अति लघुत्तरात्मकक प्रश्न 1अंक (1 अंक x 5 प्रश्न)	05
(ख)	**कार्यालयी हिंदी और रचनात्मक लेखन** **('अभिव्यक्ति और माध्यम' पुस्तक के आधार पर)**		**25**
	3	दी गई स्थिति / घटना के आधार पर रचनात्मक लेखन (विकल्प सहित) (निबंधनात्मक प्रश्न) (5 अंक x 1 प्रश्न)	05
	4	औपचारिक/अनौपचारिक पत्र (निबंधनात्मक प्रश्न) (5 अंक x 1 प्रश्न)	05
	5	व्यावहारिक लेखन (प्रतिवेदन, प्रेस-विज्ञप्ति, परिपत्र, कार्यसूची/कार्यवृत से संबंधित दो लघुउत्तरीय प्रश्न - एक तीन व एक दो अंक का) (विकल्प सहित) (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न)	05
	6	शब्दकोश से संबंधित 5 बहुविकल्पी प्रश्न (1 अंक x 5 प्रश्न)	05
	7	जनसंचार माध्यम और पत्रकारिता के विविध आयामों पर से संबंधित दो लघुउत्तरीय प्रश्न-एक तीन व एक दो अंक का) (विकल्प सहित) (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न)	05
(ग)	**पाठ्यपुस्तक**		**40**

	(1)	**आरोह भाग-1**	**30**
	(अ)	**काव्य भाग**	**15**
	8	किसी एक काव्यांश पर अर्थग्रहण से संबंधित तीन प्रश्न (2 अंक x 3 प्रश्न) (विकल्प सहित)	06
	9	एक काव्यांश के सौंदर्यबोध पर दो लघुउत्तरीय प्रश्न (2 अंक x 2 प्रश्न) (विकल्प सहित)	04
	10	कविताओं की विषयवस्तु पर आधारित दो लघुउत्तरीय-एक तीन व एक दो अंक का (विकल्प सहित) (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न)	05
	(ब)	**गद्य भाग**	**15**
	11	गद्यांश पर आधारित अर्थग्रहण से संबंधित तीन प्रश्न (2 अंक x 3 प्रश्न)	06
	12	पाठों की विषयवस्तु पर आधारित चार में से तीन बोधात्मक प्रश्न (3 अंक x 3 प्रश्न)	09
	(2)	**वितान भाग-1**	**10**
	13	पाठों की विषयवस्तु पर आधारित चार लघुउत्तरीय प्रश्न -दो तीन अंकों के व दो-दो अंकों के प्रश्न (विकल्प सहित) (3 अंक x 2 प्रश्न) + (2 अंक x 2 प्रश्न)	10
(घ)	**(क)**	**श्रवण तथा वाचन -10**	**20**
	(ख)	**परियोजना – 10**	
कुल अंक			**100**

प्रस्तावित पुस्तकें:

1. **आरोह, भाग-1,** एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित
2. **वितान भाग–1,** एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित
3. **अभिव्यक्ति और माध्यम**, एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित

❖ **नोट: निम्नलिखित पाठ हटा दिये गये हैं ।**

काव्य खंड	
1.	सत्यजित राय- अपू के साथ ढाई साल
2.	सैयद हैदर रज़ा- आत्मा का ताप
3.	रामनरेश त्रिपाठी- पथिक
4.	बालमुकुंद गुप्त- विदाई संभाषण
5.	मन्नू भंडारी- रजनी
गद्य खंड	
6.	त्रिलोचन- चंपा काले काले अच्छर नहीं चीन्हती
7.	अक्क महादेवी- I. हे भूख! मत मचल, II. हे मेरे जूही के फूल जैसे ईश्वर
8.	अवतार सिंह पाश- सबसे खतरनाक

कक्षा 12वीं हिंदी 'आधार' परीक्षा हेतु पाठ्यक्रम विनिर्देशन 2020-2021 (कोड सं. 302)

- **प्रश्न-पत्र दो खण्डों - खंड 'अ' और 'ब' का होगा|**
- **खंड 'अ' में वस्तुपरक प्रश्न पूछे जाएँगे|**
- **खंड 'अ' में कुल 58 प्रश्न होगें जिनमें से केवल 40 प्रश्नों के ही उत्तर देने होगें|**
- **खंड 'ब' में वर्णनात्मक प्रश्न पूछे जाएँगे | प्रश्नों में उचित आंतरिक विकल्प दिए जाएँगे|**

परीक्षा भार विभाजन				
खंड अ (वस्तुपरक प्रश्न)				
	विषयवस्तु		**उप भार**	**कुल भार**
1	**अपठित गद्यांश (चिंतन क्षमता एवं अभिव्यक्ति कौशल पर बहुविकल्पात्मक प्रश्न पूछे जाएंगे)**		**15**	
	अ	दो अपठित गद्यांशों में से कोई एक गद्यांश करना होगा| (450-500 शब्दों के) (1अंक x 10 प्रश्न)	10	**10**
	ब	दो अपठित पद्यांशों में से कोई एक पद्यांश करना होगा| (250-250 शब्दों के) (1अंक x 5 प्रश्न)	05	**05**
2	**कार्यालयी हिंदी और रचनात्मक लेखन ('अभिव्यक्ति और माध्यम' पुस्तक के आधार पर)**		**05**	
	अ	अभिव्यक्ति और माध्यम पुस्तक से बहुविकल्पात्मक प्रश्न (1अंक x5 प्रश्न)	05	**05**
3	**पाठ्यपुस्तक आरोह भाग – 2 से बहुविकल्पात्मक प्रश्न**		**10**	

	अ	पठित काव्यांश पर पाँच बहुविकल्पी प्रश्न (1अंक x 05 प्रश्न)	05	
	ब	पठित गद्यांश पर पाँच बहुविकल्पी प्रश्न। (1अंक x 05 प्रश्न)	05	
4	**अनुपूरक पाठ्यपुस्तक वितान भाग-2 से बहुविकल्पात्मक प्रश्न**		**10**	
	अ	पठित पाठों पर सात बहुविकल्पी प्रश्न| (1अंक x 10 प्रश्न)	10	

परीक्षा भार विभाजन

खंड ब (वर्णनात्मक प्रश्न)

	विषयवस्तु		**उप भार**	**कुल भार**
5	**कार्यालयी हिंदी और रचनात्मक लेखन**			**20**
	1	दिए गए तीन नए और अप्रत्याशित विषयों में से किसी एक विषय पर लगभग 150 शब्दों में रचनात्मक लेखन (5 अंक x1 प्रश्न)	05	
	2	औपचारिक विषय से संबधित पत्र लेखन। (5 अंक x1 प्रश्न) (विकल्प सहित)	05	
	3	कविता/कहानी/नाटक की रचना प्रक्रिया पर आधारित दो लघुउत्तरीय प्रश्न (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न) (विकल्प सहित)	05	
	4	समाचार लेखन (उल्टा पिरामिड शैली)/फीचर लेखन/आलेख लेखन पर आधारित दो लघुउत्तरीय प्रश्न (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न) (विकल्प सहित)	05	

6	**पाठ्यपुस्तक आरोह भाग – 2**			**20**
	1	काव्य खंड पर आधारित तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर (लगभग 50-60 शब्दों में) (3 अंक x 2 प्रश्न)	6	
	2	काव्य खंड पर आधारित तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर (लगभग 30-40 शब्दों में) (2 अंक x 2 प्रश्न)	4	
	3	गद्य खंड पर आधारित तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर (लगभग 50-60 शब्दों में) (3 अंक x 2 प्रश्न)	6	
	4	गद्य खंड पर आधारित तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर (लगभग 30-40 शब्दों में) (2 अंक x 2 प्रश्न)	4	
कुल अंक				**80**
7	**(अ) श्रवण तथा वाचन**		10	**20**
	(ब) परियोजना कार्य		10	
कुल अंक				**100**

निर्धारित पुस्तकें:

1. **आरोह, भाग–2,** एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित नवीनतम संस्करण
2. **वितान, भाग–2,** एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित नवीनतम संस्करण
3. **अभिव्यक्ति और माध्यम,** एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित नवीनतम संस्करण

❖ **नोट: निम्नलिखित पाठ हटा दिये गये हैं ।**

काव्य खंड	
1.	सूर्यकांत त्रिपाठी निराला-बादल राग
2.	हरिवंश राय बच्चन-(i)आत्मपरिचय
3.	आलोक धन्वा-पतंग
4.	कुँवर नारायण-(ii) बात सीधी थी पर
5.	उमाशंकर जोशी-(i) छोटा मेरा खेत, (ii) बगुलों के पंख
गद्य खंड	
6.	विष्णु खरे-चार्ली चैप्लिन यानी हम सब
7.	हजारी प्रसाद द्विवेदी-शिरीष के फूल

HISTORY
CLASS XI-XII (2020-21)
(Code No. 027)

Rationale

Through a focus on a series of critical historical issues and debates (class XI) or on a range of important historical sources (class XII), the students would be introduced to a set of important historical events and processes. A discussion of these themes, it is hoped, would allow students not only to know about these events and processes, but also to discover the excitement of reading history.

However, practical way of assessing whether the learning objectives have been actualized or not, can be ensured by the way of having stated outcomes. These outcomes have been enumerated against the learning objectives so that the concerned teachers and their students can adopt different kinds of constructive strategies and competency-based assessment techniques. It is also to be understood that the learning objectives and their outcomes are organically linked and complementary to each other.

Objectives:

- Effort in these senior secondary classes would be to emphasize to students that history is a critical discipline, a process of enquiry, a way of knowing about the past, rather than just a collection of facts. The syllabus would help them to understand the process through which historians write history, by choosing and assembling different types of evidence, and by reading their sources critically. They will appreciate how historians follow the trails that lead to the past, and how historical knowledge develops.
- The syllabus would also enable students store/relate/compare developments in different situations, analyze connections between similar processes located in different time periods, and discover the relationship between different methods of enquiry within history and the allied disciplines.
- The syllabus in class XI is organized around some major themes in the world history. The themes have been selected so as to (i) focus on some important developments in different spheres-political, social, cultural and economic, (ii) study not only the grand narratives of development-urbanization, industrialization and modernization-but also to know about the processes of displacements and marginalization. Through the study of these themes' students will acquire a sense of the wider historical processes as well as an idea of the specific debates around them.
- The treatment of each theme in class XI would include
    - an overview of the theme under discussion
    - a more detailed focus on one region of study
    - an introduction to a critical debate associated with the issue.

- In class XII the focus will shift to a detailed study of some themes in ancient, medieval and modern Indian history although the attempt is to soften the distinction between what is conventionally termed as ancient, medieval and modern. The object would be to study a set of these themes in some detail and depth rather than survey the entire chronological span of Indian history. In this sense the course will be built on the knowledge that the students have acquired in the earlier classes.
- Each theme in class XII will also introduce the students to one type of source for the study of history. Through such a study, students would begin to see what different types of sources can reveal and what they cannot tell. They would come to know how historians analyze these sources, the problems and difficulties of interpreting each type of source, and the way a larger picture of an event, a historical process, or a historical figure, is built by looking at different types of sources.
- Each theme for class XII will be organized around four sub heads:
    - a detailed overview of the events, issues and processes under discussion
    - a summary of the present state of research on the theme
    - an account of how knowledge about the theme has been acquired
    - an excerpt from a primary source related to the theme, explaining how it has been used by historians.
- While the themes in both these classes (XI and XII) are arranged in a broad chronological sequence, there are overlaps between them. This is intended to convey a sense that chronological divides and periodization do not always operate in a neat fashion.
- In the text books each theme would be located in a specific time and place. But these discussions would be situated within a wider context by
- plotting the specific event within time-lines
- discussing the particular event or process in relation to developments in other places and other times.

COURSE STRUCTURE
CLASS XI (2020-21)

One -Theory Paper **80 Marks**
3 Hours

Theme	Units	No. of Periods	Marks
	Introduction to World History	3	
Section A: Early Societies		**17**	8
	Introduction	2	
1	-Deleted for the session-2020-2021		
2.	Writing and City Life	15	

Section B: Empires		**37**	20
.	Introduction	7	
3.	An empire across three continents	15	
4.	Central Islamic lands	15	
5	--Deleted for the session-2020-2021		
Section C: Changing Traditions		**36**	20
	Introduction	7	
6	Three orders	14	
7	Changing cultural traditions	15	
8	--Deleted for the session-2020-2021		
Section D: Paths to Modernization		**52**	28
	Introduction	7	
9	The Industrial Revolution	15	
10	Displacing indigenous People	15	
11	Paths to modernization	15	
	Map work (units 1-11)	**10**	4
	Project Work	**10**	20
	Total	**165 Periods**	**100 marks**

CLASS-XI: THEMES IN WORLD HISTORY		
THEMES	**NOTE-** *This is not an exhaustive list. For reflective teaching-learning process, explicit Learning Objectives and Outcomes can be added by teachers during the course-delivery for student's real learning.*	
	LEARNING OBJECTIVES	**LEARNING OUTCOMES**
2.WRITING AND CITY LIFE Focus: Iraq, 3rd millennium BCE a) Growth of towns b) Nature of early urban societies c) Historians' Debate on uses of writing	• Familiarize the learner with the nature of early urban Centre's. • Discuss whether writing is significant as a marker of civilization.	At the completion of this unit students will be able to: • Compare and analyze the transformation from Neolithic to Bronze Age Civilization in order to understand the myriad spheres of human development. • Elucidate the interwoven social and cultural aspects of civilization in order to understand the connection between city life and culture of contemporary civilizations. • Analyze the outcomes of a sustained tradition of writing.
3.AN EMPIRE ACROSS THREE CONTINENTS Focus: Roman Empire, 27 BCE to 600 CE a) Political evolution b) Economic Expansion c) Religion-culture foundation d) Late Antiquity e) Historians' view on the Institution of Slavery	• Familiarize the learner with the history of a major world empire • Discuss whether slavery was a significant element in the economy.	At the completion of this unit students will be able to: • Explain and relate the dynamics of the Roman Empire in order to understand their polity, economy, society and culture. • Analyze the implications of Roman's contacts with the subcontinent Empires • Examine the domains of cultural transformation in that

		period
4.CENTRAL ISLAMIC LANDS Focus: 7th to 12th centuries a) Polity b) Economy c) Culture d) Historians' viewpoints on the nature of the crusades	• Familiarize the learner with the rise of Islamic empires in the Afro-Asian territories and its implications for economy and society. • Understand what the crusades meant in these regions and how they were experienced.	At the completion of this unit students will be able to: • Explain the relationship between livelihood patterns and the geographical condition of the area inhabited by the tribes and the nomadic pastoralists • Describe the arenas of Islam in reference to its emergence, rise of Caliphate and Empire building. • Analyze the causes, events and effects of Crusades. • Examine their economic life in order to understand their connectivity with various continents. • Comprehend their learning and cultural developments in varied fields like astronomy, medicine, architecture, sufism, etc.
6.THE THREE ORDERS. **FOCUS**: Western Europe 13th-16th century a) Feudal society and economy b) Formation of state c) Church and society d) Historians' views on decline of feudalism	• Familiarize the learner with the nature of the economy and society of this period and the changes within them. • Show how the debate on the decline of feudalism helps in understanding processes of transition.	At the completion of this unit students will be able to: • Explain the myriad aspects of feudalism with special reference to first, second, third and fourth order of the society. • Relate ancient slavery with serfdom • Assess the 14th century crisis and rise of the nation states.

7.CHANGING CULTURAL TRADITIONS Focus: Europe 14th-17th century a) New ideas and new trends in literature and arts b) Relationship with earlier ideas c) The contribution of West Asia d) Historians' viewpoint on the validity of the notion 'European Renaissance	• Explore the intellectual trends in the period. • Familiarize students with the paintings and buildings of the period. • Introduce the debate around the idea of 'Renaissance'.	At the completion of this unit students will be able to • Analyze the causes, events, and effects of the Renaissance, Reformation, Scientific Revolution, and Age of Exploration. • Relate the different facets of Italian cities to understand the characteristics of Renaissance Humanism and Realism. • Compare and contrast the condition of women in the Renaissance period. • Recognize major influences on the architectural, artistic, and literary developments in order to understand the facades of Renaissance. • Analysis on the approach of Martin Luther and Erasmus towards the Roman Catholic Church and its impact on later reforms. • Evaluate the Catholic Church's response to the Protestant Reformation in the form of the Counter Reformations
9.THE INDUSTRIAL REVOLUTION Focus: England 18th to 19th century a) Innovations and technological change b) Patterns of growth c) Emergence of a	• Understand the nature of growth in the period and its limits. • Initiate students to the debate on the	At the completion of this unit students will be able to • Comprehend the arenas of the Industrial Revolution in Great Britain and other countries

working class d) Historians' viewpoint, Debate on 'Was there an Industrial Revolution?'	idea of industrial revolution.	• Elucidate the technological innovations that spurred industrialization in Britain. • Analyze the social, economic, and environmental impact of the Industrial Revolution in order to understand the revolutionary and ideological transformation. • Compare and contrast the positive and negative aspects of Industrial Revolution. • Empathize for the suffering of the workers during the Industrial Revolution.
10. DISPLACING INDIGENOUS PEOPLE Focus: North America and Australia, 18th to 20th century a) European colonists in North America and Australia b) Formation of White Settler societies c) Displacement and repression of local people d) Historians' viewpoint on the impact of European settlement on indigenous population	• Sensitize students to the processes of displacements that accompanied the development of America and Australia. • Understand the implications of such processes for the displaced populations.	At the completion of this unit students will be able to • Recount some aspects of the history of the native people of America to understand their condition. • To analyze the realms of settlement of Europeans in Australia and America. • Compare and contrast the lives and roles of indigenous people in these continents
11. PATHS TO MODERNIZATION Focus: East Asia, late 19th to 20th century	• Make students aware that transformation in the modern world	At the completion of this unit students will be able to • Deduce the histories of China and Japan from

a) Militarization and economic growth in Japan b) China and the communist alternative c) Historians' Debate on the meaning of modernization (**NOTE- Keeping in view the importance of the themes i.e. Japan and China, it is advised that both must be taught in the schools)**	takes many different forms. • Show how notions like 'modernization' need to be critically assessed.	the phase of imperialism to modernization • Explore the Japanese political, cultural and economic system prior to and after the Meiji Restoration. • Analyze the domains of Japanese nationalism prior and after the Second World War. • Comprehend the history of China from colonization to era of socialism. • Summarize the nationalist upsurge in China from Dr Sun Yet Sen to Mao Ze Dong to understand the era of communism. • To analyze the Chinese path to modernization under Deng Xio Ping and Zhou en Lai in order to understand the transformation from rigid communism to liberal socialism.
MAP WORK ON UNITS 1-11		

PROJECT WORK
CLASS XI (2020-21)

INTRODUCTION

History is one of the most important disciplines in school education. It is the study of the past, which helps us to understand our present and shape our future. It promotes the acquisition and understanding of historical knowledge in breath and in depth across cultures.

The course of history in senior secondary classes is to enable students to know that history is a critical discipline, a process of enquiry, a way of knowing about the past rather than just a collection of facts. The syllabus helps them to understand the process, through which a historian collects, chooses, scrutinizes and assembles different types of evidences to write history.

The syllabus in class-XI is organized around some major themes in world history. In class XII the focus shifts to a detailed study of some themes in ancient, medieval and modern Indian history.

CBSE has decided to introduce project work in history for classes XI and XII in 2013-14 as a part of regular studies in classroom, as project work gives students an opportunity to develop higher cognitive skills. It takes students to a life beyond text books and provides them a platform to refer materials, gather information, analyze it further to obtain relevant information and decide what matter to keep and hence understand how history is constructed.

OBJECTIVES

Project work will help students:

- To develop skill to gather data from a variety of sources, investigate diverse viewpoints and arrive at logical deductions.
- To develop skill to comprehend, analyze, interpret, evaluate historical evidence and understand the limitation of historical evidence.
- To develop 21st century managerial skills of co-ordination, self-direction and time management.
- To learn to work on diverse cultures, races, religions and lifestyles.
- To learn through constructivism-a theory based on observation and scientific study.
- To inculcate a spirit of inquiry and research.
- To communicate data in the most appropriate form using a variety of techniques.
- To provide greater opportunity for interaction and exploration.
- To understand contemporary issues in context to our past.
- To develop a global perspective and an international outlook.

- To grow into caring, sensitive individuals capable of making informed, intelligent and independent choices.
- To develop lasting interest in history discipline.

GUIDELINES TO TEACHERS

This section provides some basic guidelines for the teachers to take up projects in History. It is very necessary to interact, support, guide, facilitate and encourage students while assigning projects to them.

- The teachers must ensure that the project work assigned to the students individually/ In-groups and discussed at different stages right from assigning topic, draft review to finalization.
- Students should be facilitated in terms of providing relevant materials, suggesting websites, obtaining of required permission for archives, historical sites, etc.
- The 20 periods assigned to the Project Work should be suitably spaced from April to September in classes XI and XII so that students can prepare for theory part in term - II.
- One Project should be given to the students in the month of April/May before the summer vacation and assessment of the project to be completed by September.
- The teachers must ensure that the students submit original work.
- Project report should be hand written only.
- (Eco-friendly materials can be used by students)

The following steps are suggested:

1. Teacher should design and prepare a list of 15-20 projects and should give an option to a student to choose a project as per his/her interest.
2. The project must be done individually / In-groups.
3. The topic should be assigned after discussion with the students in the class to avoid repetition and should then be discussed at every stage of submission of the draft/final project work.
4. The teacher should play the role of a facilitator and should closely supervise the process of project completion, and should guide the children by providing necessary inputs, resources etc. so as to enrich the subject content.
5. The project work (one per year) can culminate in the form of Power Point Presentation/Exhibition/Skit/albums/files/song and dance or culture show /story telling/debate/panel discussion, paper presentation and so on. Any of these activities which are suitable to visually impaired candidates can be performed as per the choice of the student.

6. Students can use primary sources available in city archives, Primary sources can also include newspaper cuttings, photographs, film footage and recorded written/speeches. Secondary sources may also be used after proper authentication.
7. Evaluation will be done by external examiner appointed by the Board in class XII and internal in class XI.

ASSESSMENT

Allocation of Marks (20)

The marks will be allocated under the following heads:

1	Project Synopsis	2 Marks
2	Data/Statistical analysis/Map work	3 Marks
3	Visual/overall presentation	5 Marks
4	Analysis/explanation and interpretation	5 Marks
5	Bibliography	1 Mark
6	Viva	4 Marks
Total		**20 Marks**

Note: The project reports are to be preserved by the school till the final results are declared, for scrutiny by CBSE.

FEW SUGGESTIVE TOPICS FOR PROJECTS

1. Anthropological Research based on Darwin's Theory
2. Critique of the industrialization in Britain
3. Relations and impacts of past crusades
4. Making and unmaking of Mesopotamia
5. Paradigms of Greeco-Roman civilization
6. Aspirations of women in Renaissance period
7. Paths to Modernization of Japan /China
8. An Exploratory study into Humanism
9. Piecing together the past of Genghis Khan
10. An in-depth study into "now and then" paradigm of Christianity
11. An exploratory study into the realism and the transmission of Humanistic ideas
12. Scientific Revolution and the origins of modern science
13. An exploratory study into the making of America
14. Myriad Realms of Slavery in ancient, medieval and modern world
15. History of aborigines – America /Australia

Note: Please refer Circular No. Acad.16/2013 dated 17.04.2013 for complete guidelines.

HISTORY– CLASS XI

SUBJECT CODE 027 (Session 2020-21)

TIME: 3 Hours **Maximum Marks: 80**

Sr. No.	Competencies	Total Marks	% Weightage
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas	24	30%
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	23	28.75%
3	**High Order Thinking Skills**- (Analysis & Synthesis- Classify, Apply, solve, compare, contrast, or differentiate between different pieces of information; Organize and/or integrate unique pieces of information from a variety of sources) **Evaluation**- (Appraise, Argue, judge, support, critique, and/or justify the value or worth of a decision or outcome, or to predict outcomes)	29	36.25%
4	**Map skill** based question- Identification, location, significance	4	5%
		80	**100%**

COURSE STRUCTURE

CLASS XII (2020-21)

One Theory Paper Max Marks: 80		Time: 3 Hours
Units	**Periods**	**Marks**
Themes in Indian History Part-I (THEMES 1 -4)	**55**	**25**
Theme 1 Bricks, Beads and Bones	13	
Theme 2 Kings, Farmers and Towns	14	
Theme3 Kinship, Caste and Class	14	
Theme 4 Thinkers, Beliefs and Buildings	14	
Themes In Indian History Part-II (THEMES- 5 – 9)	**39**	**25**
Theme 5 ---Deleted for the session-2020-2021		
Theme 6 Bhakti –Sufi Traditions	13	
Theme 7 An Imperial Capital: Vijayanagara	13	
Theme 8 --Deleted for the session-2020-2021		
Theme 9 Kings and Chronicles	13	
Themes In Indian History Part-III (THEMES 10 – 15)	**48**	**25**
Theme 10 Colonialism and The Countryside (HALF)pg-257-274	8	
Theme 11 Rebels and the Raj	13	
Theme 12 --Deleted for the session-2020-2021		
Theme 13 Mahatma Gandhi and the Nationalist Movement	13	
Theme 14 --Deleted for the session-2020-2021		
Theme 15 Framing the Constitution	14	
Map Work	**10**	**05**
Total	**142**	**80**
Project work (Internal Assessment)	**10**	**20**
Total	**162**	**100**

COURSE CONTENT

Class XII: Themes in Indian History		
Themes	**NOTE-** *This is not an exhaustive list. For reflective teaching- learning process, explicit Learning Objectives and Outcomes can be added by teachers during the course-delivery for student's real learning.*	
	Learning Objective	**Learning Outcomes**
Part-I **1.BRICKS, BEADS AND BONES** **The Harappan Civilization:** **Broad overview:** Early urb an centers **Story of discovery:** Harappan civilization **Excerpt:** Archaeological report on a major site **Discussion:** How it has been utilized by archaeologists/historians	• Familiarize the learner with early urban centers as economic and social institution. • Introduce the ways in whi ch new data can lead to a revision of existing notions of history	At the completion of this unit students will be able to: • State and deduce the multi-lateral aspects of Harappan civilization in order to understand the first civilization of the world. • Develop an ability to use and analyze socio- economic, political aspects of Harappa • Investigate and interpret historical and contemporary sources and viewpoints of ASI and historians on Harappa.
2.KINGS, FARMERS AND TOWNS: **Early States and Economies(c. 600 BCE-600 CE)** **Broad overview:** Political and economic History from the Mauryan to the Gupta period **Story of discovery:** Inscriptions and the Decipherment of the script. Shifts in the Understanding of political and economic history. **Excerpt:** Ashokan inscription and Gupta period land grant **Discussion**: Interpretation of inscriptions by historians.	• Familiarize the learner with major trends in the political and economic history of the subcontinent. • Introduce inscriptional an alysis and the ways in which these have shaped the understanding of political and economic processes.	At the completion of this unit students will be able to: • Explain major trends in the 6th century BCE in order to understand the political and economic history of the subcontinent. • Analyze inscriptional evidences and the ways in which these have shaped the understanding of political and economic processes.

3. KINSHIP, CASTE AND CLASS **Early Society Societies (C. 600 BCE-600 CE)** **Broad overview:** **Social Histories: Using the Mahabharata** Issues in social history, including caste, class, kinship and gender **Story of discovery:** Transmission and publications of the Mahabharata **Excerpt:** from the Mahabharata, illustrating how it has been used by historians. **Discussion**: Other sources for reconstructing social history.	• Familiarize the learners with issues in social history. • Introduce the strategies of textual analysis and their use in reconstructing social history.	At the completion of this unit students will be able to • Analyze social norms in order to understand the perspectives of society given in the scriptures of ancient India. • Examine the varied dimensions explored by historians in order to understand dynamic approach of Mahabharata.
4. THINKERS, BELIEFS AND BUILDINGS **Cultural Developments (c. 600 BCE - 600 CE)** **Broad overview:** **A History of Buddhism: Sanchi Stupa** A brief review of religious histories of Vedic religion, Jainism, Vaishnavism, Shaivism (Puranic Hinduism) b) Focus on Buddhism. **Story of discovery:** Sanchi stupa. **Excerpt:** Reproduction of sculptures from Sanchi. **Discussion:** Ways in which sculpture has been interpreted by historians, other sources for reconstructing the history of Buddhism.	• Discuss the major religious developments in early India. • Introduce strategies of visual analysis and their use in reconstructing the theories of religion.	At the completion of this unit students will be able to: • Compare the distinct religious facets in order to understand the religious developments in ancient India • Elucidate the rich religious sculpture and infer the stories hidden in it.

6. BHAKTI –SUFI TRADITIONS: **Changes in Religious Beliefs and Devotional Texts** **(c. eighth to eighteenth centuries)** **Broad overview:** a. Outline of religious developments during this period saints. b. Ideas and practices of the Bhakti-Sufi **Story of Transmission:** How Bhakti-Sufi compositions have been preserved. **Excerpt:** Extracts from selected Bhakti-Sufi works. **Discussion:** Ways in which these have been interpreted by historians.	• Familiarize the learner with the religious developments. • Discuss ways of analyzing devotional literature as sources of history.	At the completion of this unit students will be able to: • Summarize the philosophies of different Bhakti and Sufi saints to understand the religious developments during medieval period. • Comprehend the religious movement in order to establish unity, peace, harmony and brotherhood in society.

7. AN IMPERIAL CAPITAL: VIJAYANAGARA (c. fourteenth to sixteenth centuries) **Broad Over View: New Architecture: Hampi** a. Outline of new buildings during Vijayanagar period-temples, forts, irrigation facilities. b. Relationship between ar chitecture and the political system **Story of Discovery:** Account of how Hampi was found. **Excerpt:** Visuals of buildings at Hampi **Discussion:** Ways in which historians have analyzed and interpreted these structures.	• Familiarize the learner with the new buildings that were built during the time. • Discuss the ways in which architecture can be analyzed to reconstruct history.	At the completion of this unit students will be able to: • Classify the distinctive architectural contributions of the Vijayanagar empire to comprehend the richness of mingled cultures of deccan India • Analyze accounts of foreign traveller's on Vijayanagar in order to interpret political, social and cultural life of the city.
9. KINGS AND CHRONICLES: The Mughal Courts (c. sixteenth-seventeenth centuries) **Broad overview: Reconstructing Histories through Chronicles** a) Outline of political history15th-17thcenturies b) Discussion of the Mughal court and politics. **Story of Discovery:** Account of the production of court chronicles, and their subsequent translation and transmission.	• Familiarize the learner with the major landmarks in the political history. • Show how chronicles and other sources are used to reconstruct the histories of political institutions.	At the completion of this unit students will be able to: • Summarize the political and social practices of Mughal empire in order to understand their administrative dynamics. • Examine the account given in the chronicles to reconstruct the social, religious and cultural history of Mughals

Excerpts: from the Akbarnama and Badshahnama **Discussion:** Ways in which historians have used the text store construct political histories.		
Part-III **10. COLONIALISM AND THE COUNTRYSIDE: Exploring Official Archives** **Broad overview: Colonialism and Rural Society: Evidence from Official Reports** a) Life of zamindars, peasants and artisans in the late18th century b). Permanent Settlement, Santhals and Paharias **Story of official records:** An account of why official Investigations in to rural societies were undertaken and the types of records and reports produced. **Excerpts:** From Fifth Report **Discussion:** What the offici al records tell and do not tell, and how they have bee n used by historians.	• Discuss how colonialism affected zamindars, peasants and artisans. • Comprehend the problems and limits of using official sources for understanding the lives of the people	At the completion of this unit students will be able to: • Compare and contrast the revenue systems introduced by the British in order to understand the economic aspects of colonization in India. • Analyze the colonial official records& reports in order to understand the divergent interest of British and Indians.

11.REBELS AND THE RAJ: **1857 Revolt and its Representations** **Broad overview:** a. The eventsof1857-58. b. Vision of Unity c. How these events were recorded and narrated. **Focus:** Lucknow **Excerpts:** Pictures of 1857. Extracts from contemporary accounts. **Discussion:** How the pictures of 1857 shaped British opinion of what had happened.	• Discuss how the events of 1857 are being interpreted. • Discuss how visual material can be used by historians.	At the completion of this unit students will be able to: • Correlate the planning and coordination of the rebels of 1857 to infer its domains and nature. • Examine the momentum of the revolt in order to understand its spread. • Analyze how revolt created vision of unity amongst Indians. • Identify and Interpret visual images to understand the emotions portrayed by the nationalist and British
13. MAHATMA GANDHI AND THE NATIONALIST MOVEMENT: **Civil Disobedience and Beyond** **Broad overview:** a. The Nationalist Movement 1918 -48. b. The nature of Gandhian politics and leadership. **Focus:** Mahatma Gandhi and the three movements and his last days as “finest hours”	• Familiarize the learner with significant elements of the Nationalist movement and the nature of Gandhian leadership. • Discuss how Gandhi was perceived by different groups. Discuss how historians need to read and interpret newspapers diaries and letters as a historical source	At the completion of this unit students will be able to: • Correlate the significant elements of the nationalist movement and the nature of ideas, individuals and institutions under the Gandhian leadership.

Excerpts: Reports from English and Indian language newspapers and other contemporary writings. **Discussion:** How newspapers can be a source of history.		• Analyze the significant contributions of Gandhiji in order to understand his mass appeal for nationalism. • Analyze the perceptions and contributions of different communities towards the Gandhian movement. • Analyze the ways of interpreting historical source such as newspapers, biographies and auto-biographies diaries and letters.
15.FRAMING THE CONSTITUTION: The Beginning of a New Era **Broad overview: The Making of the Constitution an overview:** a. Independence and then new nation state. b. The making of the Constitution **Focus:** The Constituent Assembly Debates **Excerpts:** from the debates. **Discussion:** What such debates reveal and how they can be analyzed.	• Discuss how the founding ideals of the new nation state were debated and formulated. • Understand how such debates and discussions can be read by historians.	At the completion of this unit students will be able to: • Highlight the role of Constituent Assembly in order to understand functionaries in framing the constitution of India. . • Analyze how debates and discussions around important issues in the Constituent Assembly shaped our Constitution.

PROJECT WORK
CLASS - XII (2020-21)

INTRODUCTION

History is one of the most important disciplines in school education. It is the study of the past, which helps us to understand our present and shape our future. It promotes the acquisition and understanding of historical knowledge in breath and in depth across cultures.

The course of history in senior secondary classes is to enable students to know that history is a critical discipline, a process of enquiry, a way of knowing about the past rather than just a collection of facts. The syllabus helps them to understand the process, through which a historian collects, chooses, scrutinizes and assembles different types of evidences to write history.

The syllabus in class-XI is organized around some major themes in world history. In class XII the focus shifts to a detailed study of some themes in ancient, medieval and modern Indian history.

CBSE has decided to introduce project work in history for classes XI and XII in 2013-14 as a part of regular studies in classroom, as project work gives students an opportunity to develop higher cognitive skills. It takes students to a life beyond text books and provides them a platform to refer materials, gather information, analyze it further to obtain relevant information and decide what matter to keep and hence understand how history is constructed.

OBJECTIVES

Project work will help students:

- To develop skill to gather data from a variety of sources, investigate diverse viewpoints and arrive at logical deductions.
- To develop skill to comprehend, analyze, interpret, evaluate historical evidence and understand the limitation of historical evidence.
- To develop 21st century managerial skills of co-ordination, self-direction and time management.
- To learn to work on diverse cultures, races, religions and lifestyles.
- To learn through constructivism-a theory based on observation and scientific study.
- To inculcate a spirit of inquiry and research.
- To communicate data in the most appropriate form using a variety of techniques.
- To provide greater opportunity for interaction and exploration.
- To understand contemporary issues in context to our past.
- To develop a global perspective and an international outlook.
- To grow into caring, sensitive individuals capable of making informed, intelligent and independent choices.
- To develop lasting interest in history discipline.

GUIDELINES TO TEACHERS

This section provides some basic guidelines for the teachers to take up projects in History. It is very necessary to interact, support, guide, facilitate and encourage students while assigning projects to them.

- The teachers must ensure that the project work assigned to the students individually/ In-groups and discussed at different stages right from assigning topic, draft review to finalization.
- Students should be facilitated in terms of providing relevant materials, suggesting websites, obtaining of required permission for archives, historical sites, etc.
- The 20 periods assigned to the Project Work should be suitably spaced from April to September in classes XI and XII so that students can prepare for theory part in term -II.
- One Project should be given to the students in the month of April/May before the summer vacation and assessment of the project to be completed by September.
- The teachers must ensure that the students submit original work.
- Project report should be hand written only.
- (Eco-friendly materials can be used by students)

The following steps are suggested:

1. Teacher should design and prepare a list of 15-20 projects and should give an option to a student to choose a project as per his/her interest.
2. The project must be done individually/In-groups.
3. The topic should be assigned after discussion with the students in the class to avoid repetition and should then be discussed at every stage of submission of the draft/final project work.
4. The teacher should play the role of a facilitator and should closely supervise the process of project completion, and should guide the children by providing necessary inputs, resources etc. so as to enrich the subject content.
5. The project work (one per year) can culminate in the form of Power Point Presentation/Exhibition/Skit/albums/files/song and dance or culture show /story telling/debate/panel discussion, paper presentation and so on. Any of these activities which are suitable to visually impaired candidates can be performed as per the choice of the student.
6. Students can use primary sources available in city archives, Primary sources can also include newspaper cuttings, photographs, film footage and recorded written/speeches. Secondary sources may also be used after proper authentication.
7. Evaluation will be done by external examiner appointed by the Board in class XII and internal in class XI.

ASSESSMENT

Allocation of Marks (20)

The marks will be allocated under the following heads:

1	Project Synopsis	2 Marks
2	Data/Statistical analysis/Map work	3 Marks
3	Visual/overall presentation	5 Marks
4	Analysis/explanation and interpretation	5 Marks
5	Bibliography	1 Mark
6	Viva	4 Marks
Total		**20 Marks**

Note: The project reports are to be preserved by the school till the final results are declared, for scrutiny by CBSE.

FEW SUGGESTIVE TOPICS FOR PROJECTS

1. The mysteries behind the mound of dead –Mohenjo-Daro
2. An In-depth study to understand Spiritual Archaeology in the Sub-Continent
3. Buddha's Path to Enlightenment
4. Insight and Reflection of Bernier's notions of The Mughal Empire
5. An exploratory study to know the women who created history
6. "Mahatma Gandhi" – A legendary soul
7. To reconstruct the History of Vijayanagar through the Archaeology of Hampi
8. The emerald city of Colonial Era –BOMBAY
9. Vision of unity behind the first war of Independence
10. Divine Apostle of Guru Nanak Dev
11. Help, Humanity and Sacrifices during Partition
12. Glimpses inside Mughals Imperials Household
13. The process behind the framing of the Indian Constitution
14. The 'Brahm Nirupam' of Kabir – A journey to Ultimate Reality

Note: Please refer Circular No. Acad.16/2013 dated 17.04.2013 for complete guidelines.

HISTORY– CLASS XII

SUBJECT CODE 027 (Session 2020-21)

TIME: 3 Hours **Maximum Marks: 80**

Sr. No.	Competencies	Total Marks	% Weightage
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, translating, interpreting, giving descriptions and stating main ideas	24	30%
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	24	30%
3	**High Order Thinking Skills-** (Analysis & Synthesis- Classify, Apply, solve, compare, contrast, or differentiate between different pieces of information; Organize and/or integrate unique pieces of information from a variety of sources) **Evaluation-** (Appraise, Argue, judge, support, critique, and/or justify the value or worth of a decision or outcome, or to predict outcomes)	27	33.75%
4	**Map skill-based** question- Identification, location, significance	5	6.25%
		80	**100%**

LIST OF MAPS

Book 1		
1	**Page 2**	Mature Harappan sites: • Harappa, Banawali, Kalibangan, Balakot, Rakhigarhi, Dholavira, Nageshwar, Lothal, Mohenjodaro, Chanhudaro, KotDiji.
2	**Page 30**	Mahajanapada and cities : • Vajji, Magadha, Kosala, Kuru, Panchala, Gandhara, Avanti, Rajgir, Ujjain, Taxila, Varanasi.
3	**Page 33**	Distribution of Ashokan inscriptions: • Kushanas, Shakas, Satavahanas, Vakatakas,Guptas • Cities/towns: Mathura, Kannauj, Puhar,Braghukachchha • Pillar inscriptions - Sanchi, Topra, Meerut Pillar andKaushambi. • Kingdom of Cholas, CherasandPandyas.
4	**Page 43**	Important kingdoms and towns: • Kushanas, Shakas, Satavahanas, Vakatakas,Guptas • Cities/towns: Mathura, Kanauj, Puhar, Braghukachchha, Shravasti, Rajgir, Vaishali, Varanasi,Vidisha
5	**Page 95**	Major Buddhist Sites: • Nagarjunakonda, Sanchi, Amaravati, Lumbini, Nasik, Bharhut, Bodh Gaya, Ajanta.
Book 2		
1	**Page 174**	Bidar, Golconda, Bijapur, Vijayanagar, Chandragiri, Kanchipuram, Mysore, Thanjavur, Kolar, Tirunelveli
2	**Page 214**	Territories under Babur, Akbar and Aurangzeb: • Delhi, Agra, Panipat, Amber, Ajmer, Lahore, Goa.
Book 3		
1	**Page 297**	Territories/cities under British Control in1857: • Punjab, Sindh, Bombay, Madras Fort St. David, Masulipatam, Berar, Bengal, Bihar, Orissa, Avadh, Surat, Calcutta, Patna, Benaras, Allahabad and Lucknow.
2	**Page 305**	Main centres of the Revolt of 1857: • Delhi, Meerut, Jhansi, Lucknow, Kanpur, Azamgarh, Calcutta, Benaras, Gwalior, Jabalpur, Agra, Awadh.
3		Important centres of the National Movement: • Champaran, Kheda, Ahmedabad, Benaras, Amritsar, Chauri Chaura, Lahore, Bardoli, Dandi, Bombay (Quit India Resolution), Karachi.

Prescribed Books:

1. Themes in World History, Class XI, Published by NCERT
2. Themes in Indian History, Part-I, Class XII, Published by NCERT
3. Themes in Indian History Part-II, Class XII, Published by NCERT
4. Themes in Indian History Part-III, Class XII, Published by NCERT

Note: The above textbooks are also available in Hindi medium

Revised MATHEMATICS (XI-XII)

(Code No. 041)

Session – 2020-21

The Syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of the society. Senior Secondary stage is a launching stage from where the students go either for higher academic education in Mathematics or for professional courses like Engineering, Physical and Biological science, Commerce or Computer Applications. The present revised syllabus has been designed in accordance with National Curriculum Framework 2005 and as per guidelines given in Focus Group on Teaching of Mathematics 2005 which is to meet the emerging needs of all categories of students. Motivating the topics from real life situations and other subject areas, greater emphasis has been laid on application of various concepts.

Objectives

The broad objectives of teaching Mathematics at senior school stage intend to help the students:

- to acquire knowledge and critical understanding, particularly by way of motivation and visualization, of basic concepts, terms, principles, symbols and mastery of underlying processes and skills.
- to feel the flow of reasons while proving a result or solving a problem.
- to apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method.
- to develop positive attitude to think, analyze and articulate logically.
- to develop interest in the subject by participating in related competitions.
- to acquaint students with different aspects of Mathematics used in daily life.
- to develop an interest in students to study Mathematics as a discipline.
- to develop awareness of the need for national integration, protection of environment, observance of small family norms, removal of social barriers, elimination of gender biases.
- to develop reverence and respect towards great Mathematicians for their contributions to the field of Mathematics.

COURSE STRUCTURE

CLASS XI (2020-21)

One Paper Total Periods–168 [35 Minutes Each]

Three Hours **Max Marks: 80**

No.	Units	No. of Periods	Marks
I.	Sets and Functions	43	23
II.	Algebra	41	30
III.	Coordinate Geometry	33	10
IV.	Calculus	30	07
V.	Statistics and Probability	21	10
	Total	168	80
	Internal Assessment		20

*No chapter/unit-wise weightage. Care to be taken to cover all the chapters.

Unit-I: Sets and Functions

1. **Sets** **(14) Periods**

Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of a set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets.

2. **Relations & Functions** **(15) Periods**

Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (R x R only).Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs.

3. **Trigonometric Functions** **(14) Periods**

Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity $\sin^2 x + \cos^2 x = 1$, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing sin (*x*±*y*) and cos (*x*±*y*) in terms of sin*x*, sin*y*, cos*x* & cos*y* and their simple applications. Deducing identities like the following:

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$$

$$\sin\alpha \pm \sin\beta = 2\sin\frac{1}{2}(\alpha \pm \beta)\cos\frac{1}{2}(\alpha \mp \beta)$$

$$\cos\alpha + \cos\beta = 2\cos\frac{1}{2}(\alpha + \beta)\cos\frac{1}{2}(\alpha - \beta)$$

$$cos\alpha - cos\beta = -2sin\frac{1}{2}(\alpha + \beta)sin\frac{1}{2}(\alpha - \beta)$$

Identities related to sin2*x*, cos2*x*, tan2 *x*, sin3*x*, cos3*x* and tan3*x*.

Unit-II: Algebra

1. **Complex Numbers and Quadratic Equations** **(10) Periods**

Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve some of the quardratic equations. Algebraic properties of complex numbers. Argand plane. Statement of Fundamental Theorem of Algebra, solution of quadratic equations (with real coefficients) in the complex number system.

2. **Linear Inequalities** **(15) Periods**

Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Graphical method of finding a solution of system of linear inequalities in two variables.

3. **Permutations and Combinations** **(8) Periods**

Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, formula for ${}^{n}P_{r}$ and ${}^{n}C_{r}$, simple applications.

4. **Sequence and Series** **(8) Periods**

Sequence and Series. Arithmetic Progression (A. P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M.

Unit-III: Coordinate Geometry

1. Straight Lines **(8) Periods**

Brief recall of two dimensional geometry from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point -slope form, slope-intercept form, two-point form, intercept form and normal form. General equation of a line. Distance of a point from a line.

2. Conic Sections **(15) Periods**

Sections of a cone: circles, ellipse, parabola, hyperbola. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

3. Introduction to Three-dimensional Geometry **(10) Periods**

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

Unit-IV: Calculus

1. Limits and Derivatives **(30) Periods**

Derivative introduced as rate of change both as that of distance function and geometrically. Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions .Definition of derivative relate it to scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

Unit-V: Statistics and Probability

1. Statistics (11) Periods

Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data.

2. Probability (10) Periods

Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, ‘not’, ‘and’ and ‘or’ events, exhaustive events, mutually exclusive events, Probability of an event, probability of ‘not’, ‘and’ and ‘or’ events.

MATHEMATICS

QUESTION PAPER DESIGN

CLASS – XI (2020-21)

Time : 3 Hours **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	20	25
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	16	20
	Total	80	100

1. *No chapter wise weightage. Care to be taken to cover all the chapters*
2. *Suitable internal variations may be made for generating various templates keeping the overall weightage to different form of questions and typology of questions same.*

Choice(s):

There will be no overall choice in the question paper.

However, 33% internal choices will be given in all the sections

INTERNAL ASSESSMENT	**20 MARKS**
Periodic Tests (Best 2 out of 3 tests conducted)	10 Marks
Mathematics Activities	10 Marks

Note: Please refer the guidelines given under XII Mathematics Syllabus:

CLASS-XII
(2020-21)

One Paper **Max Marks:80**

No.	Units	No. of Periods	Marks
I.	Relations and Functions	17	08
II.	Algebra	35	10
III.	Calculus	57	35
IV.	Vectors and Three - Dimensional Geometry	26	14
V.	Linear Programming	13	05
VI.	Probability	20	08
	Total	168	80
	Internal Assessment		20

Unit-I: Relations and Functions

1. Relations and Functions **9 Periods**

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

2. Inverse Trigonometric Functions **8 Periods**

Definition, range, domain, principal value branch.

Unit-II: Algebra

1. Matrices **17 Periods**

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices, Invertible matrices; (Here all matrices will have real entries).

2. Determinants **18 Periods**

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

Unit-III: Calculus

1. Continuity and Differentiability **16 Periods**

Continuity and differentiability, derivative of composite functions, chain rule, derivative of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions.

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

2. Applications of Derivatives **7 Periods**

Applications of derivatives: increasing/decreasing functions, tangents and normals, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

3. Integrals **15 Periods**

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

$$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^{2+bx+c}}}$$

$$\int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^{2+bx+c}}} dx, \int \sqrt{a^2 \pm x^2}\, dx, \qquad \int \sqrt{x^2 - a^2} dx$$

Fundamental Theorem of Calculus (without proof).Basic properties of definite integrals and evaluation of definite integrals.

4. Applications of the Integrals **9 Periods**

Applications in finding the area under simple curves, especially lines, parabolas; area of circles /ellipses (in standard form only) (the region should be clearly identifiable).

5. Differential Equations **10 Periods**

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree of the type: $\frac{dy}{dx} = f(y/x)$. Solutions of linear differential equation of the type:

$$\frac{dy}{dx} + py = q, \text{ where p and q are functions of x or constant.}$$

Unit-IV: Vectors and Three-Dimensional Geometry

1. Vectors **13 Periods**

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

2. Three - dimensional Geometry **13 Periods**

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Distance of a point from a plane.

Unit-V: Linear Programming

1. Linear Programming 13 Periods

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

Unit-VI: Probability

1. Probability 20 Periods

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

Prescribed Books:

1) Mathematics Textbook for Class XI, NCERT Publications
2) Mathematics Part I - Textbook for Class XII, NCERT Publication
3) Mathematics Part II - Textbook for Class XII, NCERT Publication
4) Mathematics Exemplar Problem for Class XI, Published by NCERT
5) Mathematics Exemplar Problem for Class XII, Published by NCERT
6) Mathematics Lab Manual class XI, published by NCERT
7) Mathematics Lab Manual class XII, published by NCERT

MATHEMATICS (Code No. - 041)

QUESTION PAPER DESIGN CLASS - XII

(2020 - 21)

Time: 3 hours **Max. Marks: 80**

S. No.	Typology of Questions	Total Marks	% Weightage
1	**Remembering:** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding:** Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	44	55
2	**Applying:** Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	20	25
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating:** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating:** Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions	16	20
	Total	80	100

1. *No chapter wise weightage. Care to be taken to cover all the chapters*
2. *Suitable internal variations may be made for generating various templates keeping the overall weightage to different form of questions and typology of questions same.*

Choice(s):

There will be no overall choice in the question paper.

However, 33% internal choices will be given in all the sections

INTERNAL ASSESSMENT	**20 MARKS**
Periodic Tests (Best 2 out of 3 tests conducted)	10 Marks
Mathematics Activities 10 Marks	

Note: For activities NCERT Lab Manual may be referred

Conduct of Periodic Tests:

Periodic Test is a Pen and Paper assessment which is to be conducted by the respective subject teacher. The format of periodic test must have questions items with a balance mix, such as, very short answer (VSA), short answer (SA) and long answer (LA) to effectively assess the knowledge, understanding, application, skills, analysis, evaluation and synthesis. Depending on the nature of subject, the subject teacher will have the liberty of incorporating any other types of questions too. The modalities of the PT are as follows:

a) **Mode:** The periodic test is to be taken in the form of pen-papertest.

b) **Schedule:** In the entire Academic Year, three Periodic Tests in each subject may be conducted as follows:

Test	Pre Mid-term (PT-I)	Mid-Term (PT-II)	Post Mid-Term (PT-III)
Tentative Month	July-August	November	December-January

This is only a suggestive schedule and schools may conduct periodic tests as pertheir convenience. The winter bound schools would develop their own schedule with similar time gaps between two consecutive tests.

c) **Average of Marks**: Once schools complete the conduct of all the three periodic tests, they will convert the weightage of each of the three tests into ten marks each for identifying best two tests. The best two will be taken into consideration and the average of the two shall be taken as the final marks for PT.

d) The school will ensure simple documentation to keep a record of performance as suggested in detail circular no.Acad-05/2017.

e) **Sharing of Feedback/Performance**: The students' achievement in each test must be shared with the students and their parents to give them an overview of the levelof learning that has taken place during different periods. Feedback will help parents formulate interventions (conducive ambience, support materials, motivation and morale-boosting) to further enhance learning. A teacher, while sharing the feedback with student or parent, should be empathetic, non- judgmental and motivating. It is recommended that the teacher share best examples/performances of IA with the class to motivate all learners.

Assessment of Activity Work:

Through out the year any 10 activities shall be performed by the student from the activities given in the NCERT Laboratory Manual for the respective class (XI or XII) which is available on the link : http://www.ncert.nic.in/exemplar/labmanuals.htmla record of the same may be kept by the student. An year end test on the activity may be conducted

The weightage are as under:

- The activities performed by the student through out the year and record keeping : 5 marks
- Assessment of the activity performed during the year end test: 3 marks
- Viva-voce : 2 marks

Revised PHYSICS
Class XI-XII (Code N. 042)
(2020-21)

Senior Secondary stage of school education is a stage of transition from general education to discipline-based focus on curriculum. The present updated syllabus keeps in view the rigour and depth of disciplinary approach as well as the comprehension level of learners. Due care has also been taken that the syllabus is comparable to the international standards. Salient features of the syllabus include:

- Emphasis on basic conceptual understanding of the content.
- Emphasis on use of SI units, symbols, nomenclature of physical quantities and formulations as per international standards.
- Providing logical sequencing of units of the subject matter and proper placement of concepts with their linkage for better learning.
- Reducing the curriculum load by eliminating overlapping of concepts/content within the discipline and other disciplines.
- Promotion of process-skills, problem-solving abilities and applications of Physics concepts.

Besides, the syllabus also attempts to

- Strengthen the concepts developed at the secondary stage to provide firm foundation for further learning in the subject.
- Expose the learners to different processes used in Physics-related industrial and technological applications.
- Develop process-skills and experimental, observational, manipulative, decision making and investigatory skills in the learners.
- Promote problem solving abilities and creative thinking in learners.
- Develop conceptual competence in the learners and make them realize and appreciate the interface of Physics with other disciplines.

PHYSICS (Code No. 042)
COURSE STRUCTURE
Class XI – 2020-21 (Theory)

Time: 3 hrs. **Max Marks: 70**

		No. of Periods	Marks
Unit–I	**Physical World and Measurement**	**6**	**23**
	Chapter–1: Physical World		
	Chapter–2: Units and Measurements		
Unit-II	**Kinematics**	**16**	
	Chapter–3: Motion in a Straight Line		
	Chapter–4: Motion in a Plane		
Unit–III	**Laws of Motion**	**10**	
	Chapter–5: Laws of Motion		
Unit–IV	**Work, Energy and Power**	**12**	**17**
	Chapter–6: Work, Energy and Power		
Unit–V	**Motion of System of Particles and Rigid Body**	**16**	
	Chapter–7: System of Particles and Rotational Motion		
Unit-VI	**Gravitation**	**8**	
	Chapter–8: Gravitation		
Unit–VII	**Properties of Bulk Matter**	**22**	**20**
	Chapter–9: Mechanical Properties of Solids		
	Chapter–10: Mechanical Properties of Fluids		
	Chapter–11: Thermal Properties of Matter		
Unit–VIII	**Thermodynamics**	**10**	
	Chapter–12: Thermodynamics		
Unit–IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases**	**08**	
	Chapter–13: Kinetic Theory		
Unit–X	**Oscillations and Waves**	**23**	**10**
	Chapter–14: Oscillations		
	Chapter–15: Waves		
Total		**131**	**70**

Unit I: Physical World and Measurement 6 Periods

Chapter–1: Physical World

Physics-scope and excitement; nature of physical laws; Physics, technology and society.

(To be discussed as a part of Introduction and integrated with other topics)

Chapter–2: Units and Measurements

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

Unit II: Kinematics 16 Periods

Chapter–3: Motion in a Straight Line

Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs.

Relations for uniformly accelerated motion (graphical treatment).

Chapter–4: Motion in a Plane

Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.

Motion in a plane, cases of uniform velocity and uniform acceleration-projectile motion, uniform circular motion.

Unit III: Laws of Motion 10 Periods

Chapter–5: Laws of Motion

*Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.(*recapitulation only)

Law of conservation of linear momentum and its applications.

Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication.

Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).

Unit IV: Work, Energy and Power 12 Periods

Chapter–6: Work, Energy and Power

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power.

Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.

Unit V: Motion of System of Particles and Rigid Body 16 Periods

Chapter–7: System of Particles and Rotational Motion

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod.

Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications.

Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.

Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).

Unit VI: Gravitation 8 Periods

Chapter–8: Gravitation

Universal law of gravitation. *Acceleration due to gravity (recapitulation only)* and its variation with altitude and depth.

Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo-stationary satellites.

Unit VII: Properties of Bulk Matter 22 Periods

Chapter–9: Mechanical Properties of Solids

Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus

Chapter–10: Mechanical Properties of Fluids

Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure.

Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications.

Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.

Chapter–11: Thermal Properties of Matter

Heat, temperature,(recapitulation only) thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity.

Heat transfer-conduction, convection and radiation (recapitulation only), thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.

Unit VIII: Thermodynamics **10 Periods**

Chapter–12: Thermodynamics

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes.

Second law of thermodynamics: reversible and irreversible processes

Unit IX: Behaviour of Perfect Gases and Kinetic Theory of Gases 08 Periods

Chapter–13: Kinetic Theory

Equation of state of a perfect gas, work done in compressing a gas.

Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

Unit X: Oscillations and Waves **23 Periods**

Chapter–14: Oscillations

Periodic motion - time period, frequency, displacement as a function of time, periodic functions.

Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a loaded spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance.

Chapter–15: Waves

Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, Beats

PRACTICALS **Total Periods: 32**

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

Record of at least **8** Experiments **4** from each section, to be performed by the students

Record of at least 6 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

EVALUATION SCHEME

Time Allowed: Three hours **Max. Marks: 30**

Two experiments one from each section	**(8+8)Marks**
Practical record (experiment and activities)	**7**Marks
Viva on experiments, and activities	**7** Marks
Total	**30 Marks**

SECTION–A

Experiments

1. To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.

2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.

OR

To determine volume of an irregular lamina using screw gauge.

3. To determine radius of curvature of a given spherical surface by a spherometer.

4. To determine the mass of two different objects using a beam balance.

5. To find the weight of a given body using parallelogram law of vectors.

6.Using a simple pendulum, plot its L-T^2 graph and use it to find the effective length of second's pendulum.

OR

To study variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.

7. To study the relationship between force of limiting friction and normal reaction and to find the co- efficient of friction between a block and a horizontal surface.

OR

To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination θ by plotting graph between force and sin θ.

Activities

1. To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.
2. To determine mass of a given body using a metre scale by principle of moments.
3. To plot a graph for a given set of data, with proper choice of scales and error bars.
4. To measure the force of limiting friction for rolling of a roller on a horizontal plane.
5. To study the variation in range of a projectile with angle of projection.
6. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).
7. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.

SECTION–B

Experiments

1. To determine Young's modulus of elasticity of the material of a given wire.

OR

To find the force constant of a helical spring by plotting a graph between load and extension.

1. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and 1/V.
2. To determine the surface tension of water by capillary rise method.

OR

To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.

3. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
4. To determine specific heat capacity of a given solid by method of mixtures.
5. To study the relation between frequency and length of a given wire under constant tension using sonometer.

OR

To study the relation between the length of a given wire and tension for constant frequency using sonometer.

7. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

Activities

1. To observe change of state and plot a cooling curve for molten wax.
2. To observe and explain the effect of heating on a bi-metallic strip.

3. To note the change in level of liquid in a container on heating and interpret the observations.
4. To study the effect of detergent on surface tension of water by observing capillary rise.
5. To study the factors affecting the rate of loss of heat of a liquid.
6. To study the effect of load on depression of a suitably clamped metre scale loaded at (i) its end (ii) in the middle.
7. To observe the decrease in pressure with increase in velocity of a fluid.

Practical Examination for Visually Impaired Students Class XI

Note: Same Evaluation scheme and general guidelines for visually impaired students as given for Class XII may be followed.

A. Items for Identification/Familiarity of the apparatus for assessment in practicals (All experiments)

Spherical ball, Cylindrical objects, vernier calipers, beaker, calorimeter, Screw gauge, wire, Beam balance, spring balance, weight box, gram and milligram weights, forceps, Parallelogram law of vectors apparatus, pulleys and pans used in the same 'weights' used, Bob and string used in a simple pendulum, meter scale, split cork, suspension arrangement, stop clock/stop watch, Helical spring, suspension arrangement used, weights, arrangement used for measuring extension, Sonometer, Wedges, pan and pulley used in it, 'weights' Tuning Fork, Meter scale, Beam balance, Weight box, gram and milligram weights, forceps, Resonance Tube, Tuning Fork, Meter scale, Flask/Beaker used for adding water.

B. List of Practicals

1. To measure diameter of a small spherical/cylindrical body using vernier calipers.
2. To measure the internal diameter and depth of a given beaker/calorimeter using vernier calipers and hence find its volume.
3. To measure diameter of given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.

5. To determine the mass of a given object using a beam balance.
6. To find the weight of given body using the parallelogram law of vectors.
7. Using a simple pendulum plot L-T and L-T^2 graphs. Hence find the effective length of second's pendulum using appropriate length values.
8. To find the force constant of given helical spring by plotting a graph between load and extension.
9. (i) To study the relation between frequency and length of a given wire under constant tension using a sonometer.
   (ii) To study the relation between the length of a given wire and tension, for constant frequency, using a sonometer.
10. To find the speed of sound in air, at room temperature, using a resonance tube, by observing the two resonance positions.

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

Prescribed Books:

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

CLASS XII (2020-21) (THEORY)

Time: 3 hrs. **Max Marks: 70**

		No. of Periods	Marks
Unit–I	**Electrostatics**	**23**	**16**
	Chapter–1: Electric Charges and Fields		
	Chapter–2: Electrostatic Potential and Capacitance		
Unit-II	**Current Electricity**	**15**	
	Chapter–3: Current Electricity		
Unit-III	**Magnetic Effects of Current and Magnetism**	**16**	**17**
	Chapter–4: Moving Charges and Magnetism		
	Chapter–5: Magnetism and Matter		
Unit-IV	**Electromagnetic Induction and Alternating Currents**	**19**	
	Chapter–6: Electromagnetic Induction		
	Chapter–7: Alternating Current		
Unit–V	**Electromagnetic Waves**	**2**	**18**
	Chapter–8: Electromagnetic Waves		
Unit–VI	**Optics**	**18**	
	Chapter–9: Ray Optics and Optical Instruments		
	Chapter–10: Wave Optics		
Unit–VII	**Dual Nature of Radiation and Matter**	**7**	**12**
	Chapter–11: Dual Nature of Radiation and Matter		
Unit–VIII	**Atoms and Nuclei**	**11**	
	Chapter–12: Atoms		
	Chapter–13: Nuclei		
Unit–IX	**Electronic Devices**	**7**	**7**
	Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits		
Total		**118**	**70**

Unit I: Electrostatics 23 Periods

Chapter–1: Electric Charges and Fields

Electric Charges; Conservation of charge, Coulomb's law-force between two-point charges, forces between multiple charges; superposition principle and continuous charge distribution.

Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field.

Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet

Chapter–2: Electrostatic Potential and Capacitance

Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field.

Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor.

Unit II: Current Electricity 15 Periods

Chapter–3: Current Electricity

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity; temperature dependence of resistance.

Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge(**qualitative ideas only)**

Potentiometer - principle and its applications to measure potential difference and for

comparing EMF of two cells; measurement of internal resistance of a cell**(qualitative ideas only)**

Unit III: Magnetic Effects of Current and Magnetism 16 Periods

Chapter–4: Moving Charges and Magnetism

Concept of magnetic field, Oersted's experiment.

Biot - Savart law and its application to current carrying circular loop.

Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields

Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

Chapter–5: Magnetism and Matter

Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, bar magnet as an equivalent solenoid, magnetic field lines; earth's magnetic field and magnetic elements.

Unit IV: Electromagnetic Induction and Alternating Currents 19 Periods

Chapter–6: Electromagnetic Induction

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

Chapter–7: Alternating Current

Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits

AC generator and transformer.

Unit V: Electromagnetic waves 2 Periods

Chapter–8: Electromagnetic Waves

Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).

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

Unit VI: Optics 18 Periods

Chapter–9: Ray Optics and Optical Instruments

Ray Optics: Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.

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

Chapter–10: Wave Optics

Wave optics: Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light, diffraction due to a single slit, width of central maximum

Unit VII: Dual Nature of Radiation and Matter 7 Periods

Chapter–11: Dual Nature of Radiation and Matter

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations;

Einstein's photoelectric equation-particle nature of light.

Experimental study of photoelectric effect

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

Unit VIII: Atoms and Nuclei **11 Periods**

Chapter–12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Chapter–13: Nuclei

Composition and size of nucleus

Nuclear force

Mass-energy relation, mass defect, nuclear fission, nuclear fusion.

Unit IX: Electronic Devices **7 Periods**

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

Energy bands in conductors, semiconductors and insulators (qualitative ideas only)

Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier;

Special purpose p-n junction diodes: LED, photodiode, solar cell.

PRACTICALS **Total Periods: 32**

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

- Record of at least **8** Experiments [with **4** from each section], to be performed by the students.
- Record of at least 6 Activities [with 3 each from section A and section B], to be demonstrated by teacher

Evaluation Scheme

Time Allowed: Three hours **Max. Marks: 30**

Two experiments one from each section	**8+8 marks**
Practical record [experiments and activities]	**7 marks**
Viva on experiments, **and** activities	**7 marks**
Total	**30 marks**

SECTION–A
Experiments

1. To determine resistivity of two / three wires by plotting a graph for potential difference versus current.
2. To find resistance of a given wire / standard resistor using metre bridge.

OR

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

OR

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

3. To compare the EMF of two given primary cells using potentiometer.

OR

To determine the internal resistance of given primary cell using potentiometer.

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

OR

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

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

Activities

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

SECTION-B

Experiments

1. .To find the focal length of a convex lens by plotting graphs between *u* and *v* or between *1/u* and *1/v*.
2. To find the focal length of a convex mirror, using a convex lens.

OR

To find the focal length of a concave lens, using a convex lens.

3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
4. To determine refractive index of a glass slab using a travelling microscope.
5. To find refractive index of a liquid by using convex lens and plane mirror.
6. To draw the I-V characteristic curve for a p-n junction diode in forward bias and reverse bias.

Activities

1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
2. Use of multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether a given electronic component (e.g., diode) is in working order.
3. To study effect of intensity of light (by varying distance of the source) on an LDR.
4. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
5. To observe polarization of light using two Polaroids.
6. To observe diffraction of light due to a thin slit.
7. To study the nature and size of the image formed by a (i) convex lens, (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).
8. To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.

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

Time Allowed: Two hours **Max. Marks: 30**

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

General Guidelines

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

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

Class XII

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

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

wire, ferromagnetic rod, Transformer core, insulated wire.

B. List of Practicals

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

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

Prescribed Books:

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

QUESTION PAPER DESIGN

Theory (Class: XI/XII)

Maximum Marks: 70 **Duration: 3 hrs.**

S	Typology of Questions	Total Marks	Approximate Percentage
1	**Remembering**: Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. **Understanding**: Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	27	38 %
2	**Applying**: Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	22	32%
3	**Analysing :** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations **Evaluating :** Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating**: Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	21	30%
	Total Marks	70	100

Practical: 30 Marks

Note:

1. **Internal Choice:** *There is no overall choice in the paper. However, there will be at least 33% internal choice.*
2. *The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and typology of questions same.*