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

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 3 extracts 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 (5 Marks: 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

**E-References**


[https://www.iaspaper.net/ncert-books-free-download/](https://www.iaspaper.net/ncert-books-free-download/)

SYLLABUS BREAK-UP (MONTHLY)

MARCH and APRIL

**FLAMINGO**- The Last Lesson, My Mother at Sixty-Six, Aunt Jennifer’s Tigers, Lost Spring

**WRITING SKILLS**- Notice, Letter To Editor, Circulars,

**READING SKILLS**- Comprehension

MAY

**FLAMINGO**-The Rattrap, Indigo, Deep Water, Elementary School Classroom in a Slum

**WRITING SKILL**- Invitations And Replies, Article, Poster,

**READING SKILLS**- Comprehension

JUNE/JULY

**VISTAS**- The Enemy, A Thing of Beauty

**WRITING SKILL**-Letter to Editor,Advertisements(Classified and Commercial)

**READING SKILLS**-Comprehension and ASL

AUGUST

**FLAMINGO**- On the Face of it

**VISTAS**- Should Wizard Hit Mommy

**WRITING SKILL**- Report Writing

**READING SKILLS**- Comprehension and ASL

SEPTEMBER

**VISTAS**- Third Level

**WRITING SKILL** –Report Writing

**READING SKILL**- Comprehension and ASL

OCTOBER

**FLAMINGO** Evan's Tries an O Level
OBJECTIVES

The broad objectives of teaching Chemistry at Senior Secondary Stage are:

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

TEXT BOOKS

- Chemistry Part -I, Class-XII, Published by NCERT.
- Chemistry Part -II, Class-XII, Published by NCERT.
- E-BOOK LINK
MONTH WISE SYLLABUS BREAK-UP

MARCH

Unit VIII: "d" and "f" Block Elements

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

Lanthanoids - Electronic configuration, oxidation states, lanthanoid contraction and its consequences.

ALLOTMENT OF PROJECT WORK

APRIL

Unit V: Surface Chemistry

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

Unit X: Haloalkanes and Haloarenes.

Haloalkanes: Nomenclature, nature of C -X bond.

MAY

Unit X: Haloalkanes and Haloarenes. (CONTD.)
Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation.
Haloarenes: Nature of C-X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

JUNE
Unit XI: Alcohols, Phenols and Ethers

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

AUGUST
Unit XII: Aldehydes, Ketones and Carboxylic Acids
Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII: Organic compounds containing Nitrogen
Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

SEPTEMBER
Unit XIII: Organic compounds containing Nitrogen(Contd...)
Cyanides and Isocyanides - will be mentioned at relevant places in text.

Unit XIV: Biomolecules
Carbohydrates - Classification (aldoses and ketoses), monosaccharides (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.

**OCTOBER**

**Unit I: Solid State**
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**
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.

**OCTOBER**

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

**NOVEMBER**

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

**DECEMBER**

**Unit VII: p-Block Elements**

**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 IX: Coordination Compounds**

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

**JANUARY:**

Revision

**FEBRUARY:**

Revision

**Class XII Physics (042)**
Session (2020-21)

General Objectives:
- 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.


Text Book for the Session: NCERT.
[https://drive.google.com/drive/u/0/folders/1mkyJxd4Cc1qh7052p5_mDkfP4EzTvr08](https://drive.google.com/drive/u/0/folders/1mkyJxd4Cc1qh7052p5_mDkfP4EzTvr08)

NCERT Exemplar:-
[https://drive.google.com/drive/u/0/folders/1WAR7WTgbszTHliKnD2RBpDSPCvb8cHjO](https://drive.google.com/drive/u/0/folders/1WAR7WTgbszTHliKnD2RBpDSPCvb8cHjO)

Reference Book: Fundamentals of Physics by S.L Arora

Month wise Breakup

April:
Unit 1: Electrostatics
Chapter-1: Electric Charges and Fields

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

Chapter–2: Electrostatic Potential and Capacitance

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, 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.

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.

Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell.

May:
Unit III: Magnetic Effects of Current and Magnetism

Chapter–4: Moving Charges and Magnetism

Concept of magnetic field, Oersted's experiment.

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

Ampere's law and its applications to infinitely long straight wire. Straight 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

Chapter–6: Electromagnetic Induction

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

July:
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
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
Chapter–9: Ray Optics and Optical Instruments

refraction of light, total internal reflection and its applications, optical fibers, 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.

August:
Unit VI: Optics
Chapter–9(contd. ..)
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

**September:**
Unit VII: Dual Nature of Radiation and Matter

Chapter–11: Dual Nature of Radiation and Matter
Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light.
Matter waves-wave nature of particles, de-Broglie relation,

Unit VIII: Atoms and Nuclei
Chapter–12: Atoms
Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Chapter–13: Nuclei
Composition and size of nucleus,
Mass-energy relation, mass defect; nuclear fission, nuclear fusion.

**October:**
Unit IX: Electronic Devices

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

Experiments

SECTION–A
1. To determine resistance per cm of a given wire by plotting a graph for potential
difference versus current.

2. To find resistance of a given wire using metre bridge and hence determine the
resistivity (specific resistance) of its material.

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

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

SECTION-B

Experiments

1. To find the value of \( v \) for different values of \( u \) in case of a convex lens and to find
the focal length.

2. To determine angle of minimum deviation for a given prism by plotting a graph
between angle of incidence and angle of deviation.

3. To draw the I-V characteristic curve for a p-n junction in forward bias and reverse
bias.

4. To draw the characteristic curve of a zener diode and to determine its reverse
breaks down voltage.

CLASS XII (2020-21) (THEORY)             Max Marks: 70

Unit-I Electrostatics 16
Chapter-1: Electric Charges and Fields
Chapter-2: Electrostatic Potential and Capacitance

Unit-II Current Electricity
Chapter-3: Current Electricity

Unit-III Magnetic Effects of Current and Magnetism 17
Chapter-4: Moving Charges and Magnetism
Chapter-5: Magnetism and Matter

Unit-IV Electromagnetic Induction and Alternating Currents
Chapter-6: Electromagnetic Induction
Chapter-7: Alternating Current

Unit-V Electromagnetic Waves 18
Chapter-8: Electromagnetic Waves

Unit-VI Optics
Chapter–9: Ray Optics and Optical Instruments
Chapter–10: Wave Optics

Unit–VII Dual Nature of Radiation and Matter 12
Chapter–11: Dual Nature of Radiation and Matter

Unit–VIII Atoms and Nuclei
Chapter–12: Atoms
Chapter–13: Nuclei

Unit–IX Electronic Devices 07
Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits

SYLLABUS BREAK-UP CLASS XII SESSION (2020-21)
BIOLOGY (044)

General Objectives:

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

References for the session (2020-2021)
1. N.C.E.R.T- Biology textbook for class XII
2. Xam Idea Biology for class 12 ,Publisher-V.K Global Publications

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<tr>
<th>UNIT</th>
<th>TITLE</th>
<th>MARKS</th>
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<td>II</td>
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<td>IV</td>
<td>Biotechnology and its Applications</td>
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MONTH-WISE SYLLABUS BREAK-UP

MARCH

Unit II: Genetics and Evolution
Chapter 5- Principles and Inheritance: Mendelian inheritance; deviations from Mendelism - incomplete dominance, codominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance.

APRIL

Chapter 5- Principles and Inheritance (contd.)
Chromosome theory of inheritance; chromosomes and genes; Sex determination - in humans, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

UNIT-II
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 and human genome project; DNA fingerprinting.

MAY

Unit IV: Biotechnology and Its Applications
Chapter 11-Principles and processes of biotechnology: Genetic Engineering (Recombinant DNA Technology).

Chapter 12-Application of biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

JULY

UNIT I
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 (STD); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).

AUGUST

Unit III: Biology and Human Welfare
Chapter 8- Health and disease: Pathogens; parasites causing human diseases (malaria, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence, drug and alcohol abuse, Antibiotics: production and judicious use.

SEPTEMBER

Chapter 10- Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

OCTOBER

Unit III

Unit V: Ecology and Environment
Chapter 13- 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.

NOVEMBER

Chapter 15- Biodiversity and its conservation: Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks and sanctuaries, Ramsar sites.

DECEMBER-JANUARY-FEBRUARY

INVESTIGATORY PROJECT DISCUSSION

REVISION
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 a 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.

**Prescribed Books:**
- Mathematics Part I- Textbook for Class XII, NCERT Publication.
- Mathematics Part II- Textbook for Class XII, NCERT Publication.
- Mathematics Exemplar Problem for Class XII, NCERT Publication.
- Mathematics Lab Manual for Class XII, NCERT Publication.

**Reference Book:**
- Mathematics Class XII by Dr. R.D. Sharma Part-I & II (Dhanpat Rai Publications Private Limited)

**NCERT EBooks:**
- [Part 1](#)
- [Part 2](#)

**CBSE Revised Curriculum 20-21:**
- [Curriculum 20-21](#)

**Unit-wise Weightage:**

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<th>No.</th>
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<td>III.</td>
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<td>Vectors and Three - Dimensional Geometry</td>
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<td>V.</td>
<td>Linear Programming</td>
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<tr>
<td>VI.</td>
<td>Probability</td>
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<td><strong>Internal Assessment</strong></td>
<td><strong>20</strong></td>
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</table>

**MONTH-WISE SYLLABUS BREAKUP (2020-21)**
MARCH

Ch-3: Matrices

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

APRIL

Ch-4: Determinants

Determinant of a square matrix (up to 3 x 3 matrices), minors, cofactors 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 the inverse of a matrix.

Ch-2: Inverse Trigonometric Functions

Definition, range, domain, principal value branch.

MAY

Ch-5: Continuity and Differentiability


JULY

Ch-1: Relations and Functions
Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions.

**Ch-6: Applications of Derivatives**

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).

**Ch-7: Integrals**

Integration as an 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.

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

\[
\int \frac{px+q}{ax^2+bx+c} \, dx, \int \frac{px+q}{\sqrt{ax^2+bx+c}} \, dx, \int \sqrt{a^2+x^2} \, dx, \int \sqrt{x^2-a^2} \, dx
\]

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

**AUGUST**

**Ch-8: Applications of the Integrals**

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).

**Ch-9: Differential Equations**

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential
equations of first order and first degree of the type: \( \frac{dy}{dx} = f(y/x) \). Solutions of linear differential equation of the type: \( \frac{dy}{dx} + py = q \), where \( p \) and \( q \) are functions of \( x \) or constant.

**SEPTEMBER**

**Ch-10: Vectors**

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

**OCTOBER**

**Ch-11: Three-dimensional Geometry**

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.

**Ch-12: Linear Programming**

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).

**NOVEMBER**

**Ch-13: Probability**

Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes’ theorem, Random variable and its probability distribution.
DECEMBER, JANUARY & FEBRUARY

Revision

Class XII Session 2020-21

Subject: Informatics Practices (065)

1. Learning Outcomes:

At the end of this course, students will be able to:

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

2. Text Book: Informatics Practices for XII | Author: Preeti Arora | Publisher: Sultan Chand

3. Distribution of Marks and Periods

<table>
<thead>
<tr>
<th>Unit No</th>
<th>Unit Name</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data Handling using Pandas and Data Visualization</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Database Query using SQL</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Introduction to Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Societal Impacts</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>-</td>
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<tr>
<td></td>
<td>Practical</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
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</tbody>
</table>

4. Unit Wise syllabus
Unit 1: Data Handling using Pandas - I

Introduction to Python libraries- Pandas, Matplotlib.

Data structures in Pandas - Series and Data Frames.

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

Data Frames: creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing;

Importing/Exporting Data between CSV files and Data Frames.

Data Visualization

Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram

Customizing plots: adding label, title, and legend in plots.

Unit 2: Database Query using SQL

Math functions: POWER (), ROUND (), MOD ()

Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ()

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ()

Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*)

Querying and manipulating data using Group by, Having, Order by.

Unit 3: Introduction to Computer Networks

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

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

Network Topologies: Star, Bus, Tree, Mesh.
Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.

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

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

**Unit 4: Societal Impacts**

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

E-waste: hazards and management.

Awareness about health concerns related to the usage of technology.

<table>
<thead>
<tr>
<th>SNo</th>
<th>Month</th>
<th>Chapter</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>April-May</td>
<td>Ch 6: Societal Impacts</td>
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<tr>
<td></td>
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<td>Ch 4: Database Query using SQL</td>
</tr>
<tr>
<td>2</td>
<td>July</td>
<td>Ch – 5 :Computer Networks</td>
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<tr>
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<td>Numpy Revision</td>
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<tr>
<td>3</td>
<td>August</td>
<td>Ch – 1 : Data Handling using Pandas – 1</td>
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<tr>
<td>4</td>
<td>September</td>
<td>Ch – 6 Societal Impacts</td>
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<td>(Repeat as per rationalized syllabus)</td>
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<tr>
<td>5</td>
<td>October</td>
<td>Ch – 3 : Data Visualization using PyPlot</td>
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<tr>
<td>6</td>
<td>November</td>
<td>Ch – 3 : Data Visualization using PyPlot</td>
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<tr>
<td></td>
<td></td>
<td>Project Work</td>
</tr>
<tr>
<td>7</td>
<td>December - February</td>
<td>Revision</td>
</tr>
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</table>

CBSE curriculum link
Computer Science (083)
CLASS-XII
2020-21

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.

Distribution of Marks:

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Unit Name</th>
<th>Theory Marks</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Computational Thinking and Programming – 2</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>II</td>
<td>Computer Networks</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>III</td>
<td>Database Management</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>70</td>
<td>80</td>
</tr>
</tbody>
</table>

Text Book – Computer Science with Python
Author – Preeti Arora
Publications: Sultan Chand
NCERT BOOK (yet to released): [http://ncert.nic.in/textbook/textbook.htm](http://ncert.nic.in/textbook/textbook.htm)
CBSE curriculum link

April
● 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

May - June

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.

JULY

Unit I: Computational Thinking and Programming - 2

● File handling: Need for a data file, Types of file: Text files, Binary files and CSV (Comma separated values) files.

AUGUST
● 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( ).

SEPTEMBER

● Using Python libraries: Import Python libraries.
● Data-structures: Lists as covered in Class XI, Stacks – Push, Pop using a list.

PROJECT WORK

OCTOBER

Unit III: Database Management


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 ( );

NOVEMBER

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
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Area</th>
<th>Marks</th>
</tr>
</thead>
</table>
| 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     |
| 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     |

**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.

Class XII
Session 2020-21
Subject: Psychology (037)

Objectives:

● To develop appreciation about human mind and behavior in the context of learners’ immediate society and environment.
● To develop in learners an appreciation of the nature of psychological knowledge and its application to various aspects of life.
● To enable learners to become perceptive, socially aware and self-reflective.
● To facilitate students’ quest for personal growth and effectiveness, and to enable them to become responsive and responsible citizens.

RESOURCES

NCERT : Psychology- Textbook for Class XII
http://ncert.nic.in/textbook/textbook.htm

MONTH WISE SYLLABUS BREAK-UP

THEORY- [ 70 Marks]

APRIL
UNIT 1 Variations in Psychological Attributes [ 12 Marks]
1. Introduction
2. Individual Differences in Human Functioning
3. Assessment of Psychological Attributes
4. Intelligence
5. Theories of Intelligence: Psychometric Theories of Intelligence, Information Processing Theories, Theory of Multiple Intelligences, Triarchic Theory of Intelligence, Planning, Attention-Arousal and Simultaneous Successive Model of Intelligence
6. Individual Differences in Intelligence
7. Culture and Intelligence
8. Emotional Intelligence
10. Creativity

MAY
Unit III Meeting Life Challenges [10 Marks]
1. Introduction
2. Nature, Types and Sources of Stress
3. Effects of Stress on Psychological Functioning and Health
   Stress and Health
   General Adaptation Syndrome
   Stress and Immune System
   Lifestyle
4. Coping with Stress
   Stress Management Techniques
5. Promoting Positive Health and Well-being
   Stress Resistant Personality
   Life Skills
   Positive Health

JULY
Unit II Self and Personality [13 Marks]
1. Introduction
2. Self and Personality
3. Concept of Self
4. Cognitive and Behavioural Aspects of Self
5. Culture and Self
6. Concept of Personality
8. Assessment of Personality - Self-report Measures∙ Projective Techniques∙ Behavioural Analysis∙

AUGUST
Unit IV Psychological Disorders [13 Marks]
1. Introduction
2. Concepts of Abnormality and Psychological Disorders
   Historical Background
3. Classification of Psychological Disorders
4. Factors Underlying Abnormal Behaviour
5. Major Psychological Disorders
   - Anxiety Disorders
   - Obsessive-Compulsive and Related Disorders
   - Trauma-and Stressor-Related Disorders
   - Somatic Symptom and Related Disorders
   - Dissociative Disorders
   - Depressive Disorder
   - Bipolar and Related Disorders
   - Schizophrenia Spectrum and Other Psychotic Disorders
   - Neurodevelopmental Disorders
   - Disruptive, Impulse-Control and Conduct Disorders
   - Feeding and Eating Disorders
   - Substance Related and Addictive Disorders

Unit V Therapeutic Approaches  [7 Marks]
1. Nature and Process of Psychotherapy
2. Therapeutic relationship

SEPTEMBER

Unit V Therapeutic Approaches
3. Types of Therapies
   - Behaviour Therapy
   - Cognitive Therapy
   - Humanistic-Existential Therapy
   - Alternative Therapies
4. Rehabilitation of the Mentally Ill

Unit VI Attitude and Social Cognition  [8 Marks]
1. Introduction
2. Explaining Social Behaviour
3. Nature and Components of Attitudes
4. Attitude Formation and Change
   - Attitude Formation
   - Attitude Change
   - Attitude-Behaviour Relationship
OCTOBER

Unit VI Attitude and Social Cognition
5. Prejudice and Discrimination
6. Strategies for Handling Prejudice
7. Schemas and Stereotypes
8. Impression Formation and Explaining Behaviour of Others through Attributions
   • Impression Formation
   • Attribution of Causality
9. Behaviour in the Presence of Others
10. Pro-social Behaviour
    • Factors Affecting Pro-social Behaviour

Unit VII Social Influence and Group Processes [7 Marks]
1. Introduction
3. Type of Groups
4. Influence of Group on Individual Behaviour
   • Social Loafing
   • Group Polarisation

NOVEMBER

PRACTICAL EXAM [30 Marks]

3 Test administration:

Students are required to administer and interpret THREE psychological tests related to various psychological attributes like intelligence, aptitude, attitude, personality, etc.

DECEMBER, JANUARY, FEBRUARY

REVISION, VIVA PREPARATION
Syllabus Break-up

PHYSICAL EDUCATION

Class 12, 2020-21

April
- Unit 1, Planning in Sports
- Unit 2, Sports and Nutrition

May
- Unit 3, Yoga and Lifestyle
- Unit 4, Physical Education and Sports for CWSN

June
- Practical file work

July
- Children and Women in Sports

August
- Unit 6, Test and Measurement in Sports
- Unit 7, Physiology and Injuries in Sports

September
- Unit 8, Biomechanics and Sports
- Unit 9, Psychology and Sports

October
- Unit 10, Training in Sports

November and December
- Revision of syllabus