

**Class – XII (Science) (2022-23)**  
**English**

**I Term** **(April-September)**

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**March**

Familiarization with the course and marking scheme

**Literature**

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1. My Mother at Sixty-Six
2. Keeping Quiet
3. A Thing of Beauty
4. Aunt Jennifer's Tigers
5. A Roadside Stand

**April**

**Literature**

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1. The last lesson
2. The Lost Spring
3. The Third Level

**Language**

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Writing Skills : Formal Letters , Articles  
Reading Skills: Invitations

**May**

**Literature**

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1. Deep Water
2. The Rattrap
3. Indigo

**Language**

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Writing Skills: Notice writing

**July**

**Literature**

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1. Poets and Pancakes
2. On the face of it

**Language**

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Writing Skills :Invitations & their replies

**August**

**Literature**

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1. The Enemy
2. Journey to the End of the Earth

**Language**

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Writing Skills : Report Writing

**September**

**Language**

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Writing Skills : Letter – Job Application  
**ASSESSMENT OF LISTENING AND  
SPEAKING (ASL)**

Revision

**II Term****(October - December)**

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**October**

Literature

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- 1 The Tiger King
2. The Interview

**November**

Literature

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1. Going Places
2. Memories of childhood

Revision

**Mathematics(2022-23)**

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**Ist Term****(April - September)**

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**March**

1. Matrices

**April**

1. Determinants
2. Inverse Trigonometry

**May**

1. Continuity and Differentiability

**July**

1. Applications of derivatives
2. Linear Programming

**August**

1. Relations and function
2. Integration

**September**

1. Integration(Continue.....)
  2. Application of Integration
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**2<sup>nd</sup> Term****(October – December)**

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**October**

1. Differential equation
2. Vector

**November**

1. Three-dimensional Geometry
2. Probability

**December**

Revision

## PHYSICS (2022-2023)

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**Ist Term**

**(March - September)**

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**MARCH: RAY OPTICS**

Reflection, refraction, Dispersion, Optical Instruments, Telescopes and Microscopes. Magnifying Power.

**ELECTROSTATICS**

Electrostatics, Coulomb's law, charges, Electrostatic force, Electric field Intensity,

**APRIL: ELECTROSTATICS**

Electrostatic Potential, Electrostatic potential energy, Gauss's law, Capacitors, Equipotential.

**CURRENT ELECTRICITY**

Current Electricity, Ohm's law, Kirchhoff's law, Resistors in series and in parallel, Measurement of current, resistance, e.m.f. Potential difference and internal resistance, Wheatstone bridge.

**MAY: MAGNETIC EFFECT OF AN ELECTRIC CURRENT AND MAGNETISM**

Biot Savart Law, Lorentz force, moving coil galvanometer, ammeter, voltmeter, forces on parallel current carrying wires, Magnets, current loop as a magnetic dipole, Geomagnetism, diamagnetism, paramagnetism and ferromagnetism. Electromagnets and Permanent magnets.

**JULY: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT CIRCUITS**

Induced e.m.f. Faraday's Law, Lenz's Law, self and mutual Induction. Alternating current circuits, Resonant series circuits. Transformer, Generator.

**AUGUST: WAVE OPTICS**

Huygens's Principle, reflection, refraction, interference, diffraction.

**ELECTROMAGNETIC WAVES**

Brief history of e.m.w. Hertz experiment, electromagnetic spectrum,

**SEPTEMBER: REVISION**

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**2<sup>nd</sup> Term**

**(October – December)**

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**OCTOBER: DUAL NATURE OF MATTER AND RADIATION**

Photons, Photoelectric effect and Photocells, Dual nature of matter, Germer Davisson Experiment.

**ELECTRONIC DEVICES**

Solids and Semiconductor Devices, Band Theory, Diodes,

**NOVEMBER: ATOMS AND NUCLEAR PHYSICS**

Atomic theories, hydrogen atom, hydrogen spectrum, Nucleus, Radioactivity, Fission and Fusion, Mass Defect and Binding Energy, Nuclear Forces.

**DECEMBER: REVISION**

## CHEMISTRY(2022-23)

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**Ist Term**

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**(March - September)**

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**March**

**Unit X : Haloalkanes and Haloarenes**

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

Haloarenes: Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

**April**

**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, uses with special reference to methanol and ethanol.

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

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

**May**

**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, uses.

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

**July**

**Unit XIII : Amines**

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

Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

**Unit IV : Biomolecules**

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

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

Hormones - Elementary idea excluding structure.

Vitamins - Classification and functions.

Nucleic Acids: DNA and RNA.

<b>August</b>	<p><b>Unit II : Solutions</b> 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, abnormal molecular mass, Van't Hoff factor.</p>
<b>September</b>	Revision, First Term Exam
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<b>2<sup>nd</sup> Term</b>	<b>(October – December)</b>
<b>October</b>	<p><b>Unit III : Electro Chemistry</b> Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, fuel cells, corrosion.</p> <p><b>Unit IV : Chemical kinetics</b> Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), activation energy, Arrhenius equation.</p>
<b>November</b>	<p><b>Unit VIII : D and F Block Elements Lanthanoids, Actinoids</b></p> <p>General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first-row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of <math>K_2Cr_2O_7</math> and <math>KMnO_4</math>.</p> <p>Lanthanoids – Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.</p> <p>Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids..</p> <p><b>Unit IX : Coordination Compounds</b> Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, the importance of coordination compounds (in qualitative analysis, extraction of metals and biological system)</p>
<b>December</b>	Revision Annual Examination
<b>January</b>	Pre Board Examination
<b>February</b>	Board Practical Exam

**Prescribed Books:**

1. CHEMISTRY, Class XII, Published by NCERT

# BIOLOGY

## Zoology(2022-23)

1st Term	(April - September)
<b>March/April</b>	CHAPTER 3 – HUMAN REPRODUCTION Male & Female Reproductive Systems, Gametogenesis, Menstrual Cycle, Fertilization, Implantation, Pregnancy & Embryonic development, Parturition, Lactation
<b>May</b>	CHAPTER 4 – REPRODUCTIVE HEALTH Reproductive health – Problems and Strategies , Population explosion , Birth Control , Medical termination of Pregnancy , Sexually transmitted diseases , Infertility .  CHAPTER 15 – BIODIVERSITY AND CONSERVATION Biodiversity , Biodiversity and conservation.
<b>July</b>	CHAPTER 6--- MOLECULAR BASIS OF INHERITANCE The DNA, The search for genetic material, RNA world, Replication, Transcription, Genetic code, Translation, Regulation of Gene expression, Human Genome Project, DNA fingerprinting .
<b>August</b>	CHAPTER 6--- MOLECULAR BASIS OF INHERITANCE(Contd.....)  CHAPTER 13 – ORGANISMS AND POPULATIONS Organisms and its environment . Populations , Niche.
<b>September</b>	CHAPTER 13 – ORGANISMS AND POPULATIONS(Contd...) Revision Half Yearly Examination
2 <sup>nd</sup> Term	(October – February)
<b>October</b>	CHAPTER 11 – BIOTECHNOLOGY : PRINCIPLES AND PROCESSES Principles of Biotechnology , Tools of Recombinant D.N.A Technology , Processes of Recombinant D.N.A Technology .  CHAPTER 12 – BIOTECHNOLOGY & ITS APPLICATIONS Biotechnological applications in medicine , Transgenic Animals . Ethical issues
<b>November</b>	CHAPTER 8--- HUMAN HEALTH & DISEASES Common diseases in humans, Immunity, AIDS, Cancer, Drugs & alcohol Abuse

<b>December</b>	Revision Annual Examination
<b>January</b>	Pre-Board Examination

### **Botany(2022-23)**

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<b>Ist Term</b>	<b>(April - September)</b>
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<b>March</b>	Chapter 2. Sexual reproduction in flowering plants Pre-fertilization-structure and events; double fertilization; Post fertilization-structure and events; Apomixis and Polyembryony.
<b>April</b>	Chapter 2. Continuing....
<b>May</b>	Chapter 5. Principles of inheritance and variation. Mendel's laws of inheritance; inheritance of one gene; inheritance of two genes; Pleiotropy; sex determination; genetic disorders.
<b>July</b>	Chapter 5. continuing...
<b>August</b>	Chapter 7. Evolution Origin of life; Evolution of life forms-a theory; What are the evidences for evolution; What is adaptive radiation? Biological evolution; mechanism of evolution; Hardy-Weinberg principle; brief account of evolution; origin and evolution of man.  Revision.
<b>September</b>	<b>First Terminal Examination</b>

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<b>.2<sup>nd</sup> Term</b>	<b>(October – February)</b>
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<b>October</b>	CHAPTER 10 – MICROBES IN HUMAN WELFARE Microbes in household products. Microbes in industrial products. Microbes in sewage treatment . Microbes in production of biogas . Microbes as biocontrol agents. Microbes as biofertilizers.
<b>November</b>	CHAPTER 14 – ECOSYSTEM Ecosystem – Structure and Function , Productivity, Decomposition , Energy flow , Ecological pyramids , Ecological succession , Nutrient cycling , Ecosystem Services .
<b>December</b>	Revision

**March****UNIT 1: 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 function

**April – May****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: Introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join
- Interface of Python with an SQL database:
  - Connecting SQL with Python
  - Creating Database connectivity Applications
  - Performing Insert, Update, Delete queries
  - Display data by using fetchone(),fetchall(),rowcount
  - creating database connectivity application
- Board 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.*

**\*\* Python with MySQL Board Project and detailed Assignment on the above topics**



<b>July</b>	<p><b>UNIT 1: Computational Thinking and Programming - 2</b> (Continued.....)</p> <ul style="list-style-type: none"> <li>• File handling: Need for a data file, Types of file: Text files, Binary files and CSV (Comma separated values) files</li> <li>• 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.</li> <li>• 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.</li> </ul>
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<b>August</b>	<p><b>UNIT 1: Computational Thinking and Programming - 2</b> (Continued.....)</p> <ul style="list-style-type: none"> <li>• 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( ).</li> <li>• Data-structures: Stack, operations on stack (push &amp; pop), implementation of stack using list.</li> </ul>
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<b>September</b>	Revision
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<b>.2<sup>nd</sup> Term</b>	<b>(October – February)</b>
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<b>October</b>	<p><b>UNIT II: Computer Networks</b></p> <ul style="list-style-type: none"> <li>• Evolution of Networking: ARPANET, Internet, Interspace Different ways of sending data across the network with reference to switching techniques (Circuit and Packet switching).</li> <li>• Data Communication terminologies: Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, Kbps, Mbps, Gbps, Tbps).</li> <li>• Transmission media: Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link.</li> <li>• Network devices: Modem, RJ45 connector, Ethernet Card, Router, Switch, Gateway, WiFi card.</li> <li>• Network Topologies and types: Bus, Star, Tree, PAN, LAN, WAN, MAN.</li> <li>• 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.</li> <li>• Mobile Telecommunication Technologies: 1G, 2G, 3G, 4G and 5G; Mobile processors;</li> <li>• Electronic mail protocols such as SMTP, POP3, Protocols for Chat and Video Conferencing: VoIP, Wireless technologies such as Wi-Fi and WiMax</li> <li>• 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.</li> <li>• 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.</li> </ul>
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**\*\*\*Final Board Project Submission (The Source Code) , Demonstration and its Assessment**

<b>November</b>	<p>Revision Board Project Report file submission and Final Assessment</p>
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<b>December</b>	Annual Examinations and Preboard Practicals
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<b>January</b>	Pre Board Examinations
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**March Unit-I: Variations in Psychological Attributes**

*The topics in this unit are:*

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
9. Special Abilities: Aptitude: Nature and Measurement
10. Creativity

**April / May Unit-II: Self and Personality**

*The topics in this unit are:*

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
7. Major Approaches to the Study of Personality
  - Type Approach
  - Trait Approach
  - Psychodynamic Approach
  - Behavioural Approach
  - Cultural Approach
  - Humanistic Approach
8. Assessment of Personality
  - Self-report Measures
  - Projective Techniques
  - Behavioural Analysis

**July Unit-III: Meeting Life Challenges**

*The topics in this unit are:*

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

## August

### Unit – IV : Psychological Disorders

*The topics in this unit are:*

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

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**2<sup>nd</sup> Term**

**(October – February)**

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## September /October

### Unit – V : Therapeutic Approaches

*The topics in this unit are:*

1. Nature and Process of Psychotherapy
  - Therapeutic relationship
2. Types of Therapies
  - Psychodynamic Therapy
  - Behaviour Therapy
  - Cognitive Therapy
  - Humanistic-Existential Therapy
  - Biomedical Therapy

- Alternative Therapies
- Rehabilitation of the Mentally Ill

## November

### **Unit – VII : Social Influence and Group Processes**

*The topics in this unit are:*

1. Introduction
2. Nature and Formation of Groups
3. Type of Groups
4. Influence of Group on Individual Behaviour
  - Social Loafing
  - Group Polarisation

**December** Annual Examinations and Preboard Practicals

**January** Pre Board Examinations

### **Practical Marks 30**

- 5 Psychological Test
- 1 Case Profile

### **Prescribed Books:**

1. Psychology, Class XII, Published by NCERT