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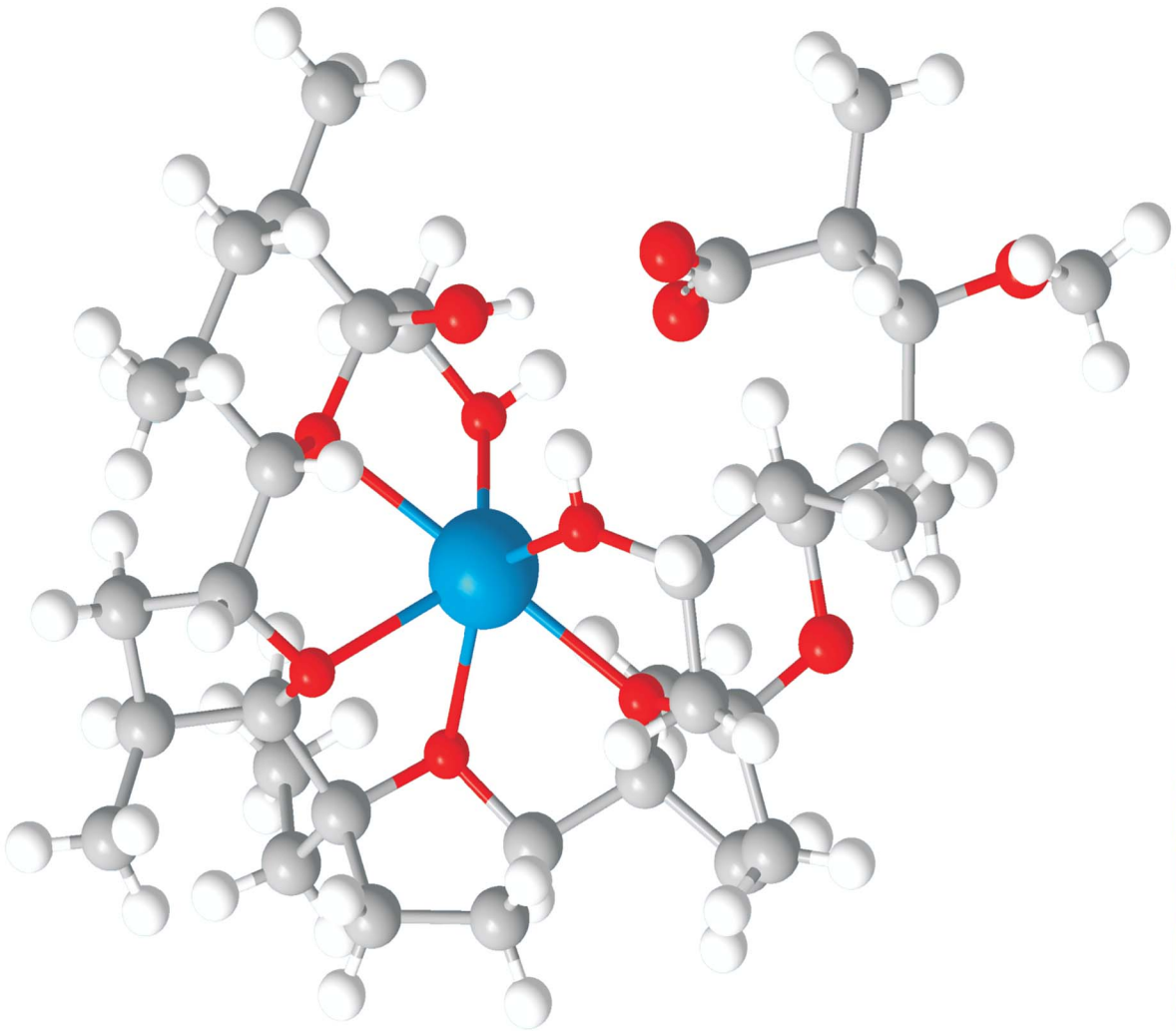

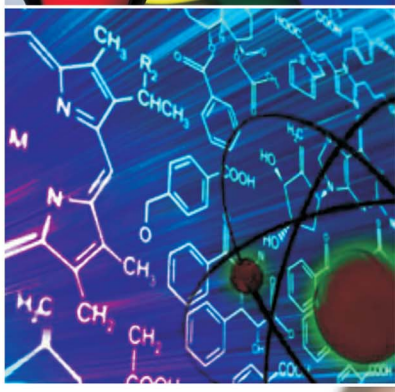

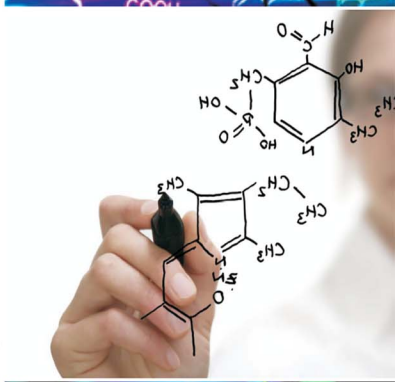

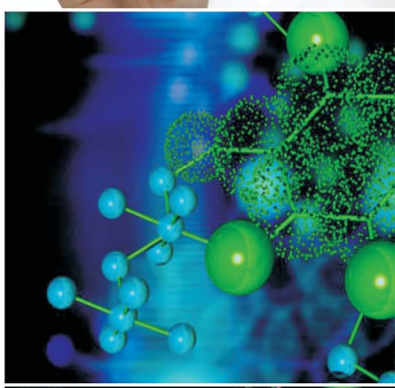

CLASS XI

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[CLASS XI]

Strictly according to new syllabus prescribed by

Central Board of Secondary Education (CBSE)
and
State Boards of Chhattisgarh, Haryana, Bihar, Jharkhand, Kerala, Mizoram, Meghalaya, Punjab, Uttarakhand and other States following NCERT curriculum

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C—
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This book is
dedicated
to
my father
Sh. Mitra Sen Sharma

With
Immense Love and Regards

Aim not for what you are,
But what you could be,
Challenge yourself,
Release your hidden potential.

CONTENTS

LETTER TO THE STUDENTS

Dear students,

In this age of nail-biting competition, it really helps to be well equipped in the subject knowledge in order to break the ice in the competitive area. So, while the market is flooded with numerous repetitions of books which mark your intellectuality and competency, we have endeavoured to reach out to your wider examination needs in this edition. Keeping in mind the broader comprehensive needs of the subject knowledge we have put in our best efforts in this book.

I thankfully acknowledge the co-ordination and guidance of the respected Chairman Sir Mr. P. Singh, Principal Mr. J.S. Kellogg, Deputy Chairman Mr. Sanjay Singh and Vice Principal Mr. C.B. Tiwari, Nutan Vidya Mandir, Dilshad Garden, Delhi.

I am highly thankful to my better half Ms. Bindu Sharma, who is always a source of inspiration to me.

I am thankful to Dr. N.P. Dhaka (Principal), Mr. Bishan Lal (Principal), Dr. K.K. Madan (Principal). Dr. Azhar Aslam Khan, Dr. H.R. Modi, Mr. Mukesh Chand, Mr. N.A. Khan (Dilshad Garden), Mr. A.N. Karan (Yamuna Vihar), Mr. Sandeep Rathi, Dr. Manoj Gupta, Ms. Ranjana Sharma, Ms. Hardeep Kaur, Ms. Mamta Sharma, Ms. Anita Nayar, Ms. Sarita Taneja, Ms. Sangeeta Vaid, Mr. Sushil Khanna, Mr. Amit Choudhary, Mr. H.K. Sharma, Dr. Anil Kumar, Dr. (Mrs.) Sunanda Talwar, Ms. Meenakshi Gupta, Ms. Seema Singh, Ms. Aradhana Roy, Mr. S.N. Gupta, Ms. Mamta Rampal, Mr. Balbir Singh, Ms. Suman, Ms. Sarita Tyagi, Mr. Amit Ahlawat, Ms. Jaiita Das, Mr. Prem Pal Singh, and all PGTs whose interaction has always encouraged me in developing this book.

Although I have taken care and laid down all efforts to remove any discrepancy which might have crept in, yet criticism or suggestions are always solicited from your end. Thanking you in anticipation for your co-operation.

Please do write to author or our publishers.

Wishing for your success.

—AUTHOR

Cracking The Examination In Chemistry

Tips and Tricks to do well in the exams

Description: Chemistry is as scoring as Maths, will carry 70 marks. The rest 30 marks will be for the practical exam in the school.

POINTS TO REMEMBER

- Know you syllabus and exam structure well. You must know the division of syllabus into various units and their weightage clearly.
- Physical chemistry portion is very scoring.
- In inorganic chemistry, spend more time on *s*-block and *p*-block elements unit.
- Organic portion require regular revision.
- NCERT textbooks and exam kit are more than sufficient for thorough preparation.
- Once the textbook is revised, you may go through various school examination papers.
- Close to the examinations, one should only practice sample papers and take mock tests. Understand your strengths and weak points.
- Revise the portions where you think you need improvement and further consolidate your strengths. This can make a huge difference to your final results and your confidence.
- Spend 10 minutes going through the question paper first and plan how you will take the exam. Attempt the questions that you know well.
- Two days before the exams one should relax rather than learning new topics. It is important not to keep yourself busy all night revising the entire curriculum just before the exams.
- Prioritize revising the important topics.
- Eat sensibly. Drink plenty of water and energy juices.
- Always think positive. Getting worried about how difficult the subject is and how your preparation is not up to the mark, will make the things more difficult.
- It's better to complete a small project than to leave a big one half done.
- Commit your life, your plans, your hopes, your dreams, and your fears to God through prayer everyday. In return you will have peace and success in your life.

SYLLABUS

CHEMISTRY—CLASS XI (Theory)
COURSE STRUCTURE

Total Periods : 160

One Paper (Theory) **Time : 3 hours** **70 Marks**

Unit No. Title	No. of Periods	Marks
I. Some Bsic Concepts of Chemistry	12	11
II. Structure of Atom	14	
III. Classification of Elements and Periodicity in Properties	08	4
IV. Chemical Bonding and Molecular Structure	14	21
V. States of Matter: Gases and Liquids	12	
VI. Chemical Thermodynamics	16	
VII. Equilibrium	14	
VIII. Redox Reactions	06	16
IX. Hydrogen	08	
X. *s*-Block Elements	10	
XI. Some *p*-Block Elements	14	
XII. Organic Chemistry: Some Basic Principles and Techniques	14	18
XIII. Hydrocarbons	12	
XIV. Environmental Chemistry	06	
Total	**160**	**70**

Unit I : Some Basic Concepts of Chemistry **(Periods 12)**

General Introduction: Importance and scope of chemistry.

Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules.

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 **(Periods 14)**

Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations, 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 of 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 (Periods 8)

Significance of classification, brief history of the development of periodic table, 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 (Periods 14)

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 (Periods 12)

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. Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea).

Liquid State—vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

Unit VI : Chemical Thermodynamics (Periods 16)

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, heat capacity and specific heat, 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, Gibbs energy change for spontaneous and non-spontaneous processes, criteria for equilibrium.

Third law of thermodynamics (brief introduction).

Unit VII : Equilibrium (Periods 14)

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, Henderson Equation, hydrolysis of salts (elementary idea), buffer solution, solubility product, common ion effect (with illustrative examples).

Unit VIII : Redox Reaction **(Periods 6)**

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, applications of redox reactions.

Unit IX : Hydrogen **(Periods 8)**

Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen, hydrides-ionic covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen peroxide—preparation, reactions and structure and use; hydrogen as a fuel.

Unit X : *s*-Block Elements (Alkali and Alkaline Earth Metals) **(Periods 10)**

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.

Preparation and Properties of Some Important Compounds

Sodium carbonate, sodium chloride, sodium hydroxide and Sodium hydrogen carbonate, biological importance of sodium and potassium.

Calcium oxide and Calcium carbonate and their industrial uses, biological importance of Magnesium and Calcium.

Unit XI : Some *p*-Block Elements **(Periods 14)**

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, some important compounds, borax, boric acid, boron hydrides, Aluminium: Reactions with acids and alkalies, uses.

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; uses of some important compounds: oxides.

Important compounds of silicon and a few uses: silicon tetrachloride, silicones, silicates and Zeolites, their uses.

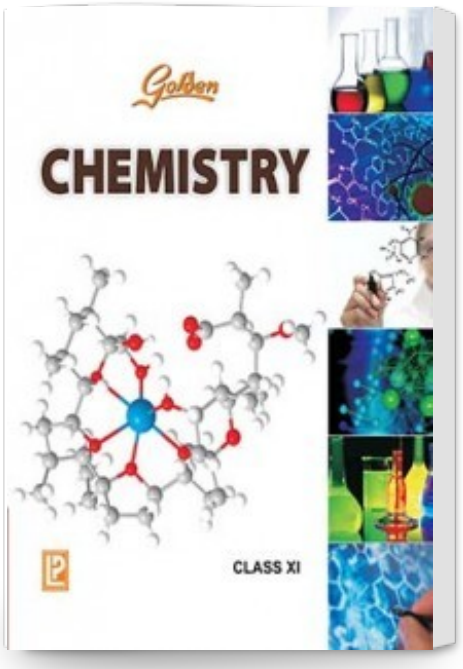
Unit XII : Organic Chemistry: Some Basic Principles and Technique **(Periods 14)**

General introduction, methods of purification, qualitative and quantitative analysis, 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.

Golden Chemistry Class XI (New Edition)



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