Haryana Board

Syllabus

2024-25

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BOARD OF SCHOOL EDUCATION HARYANA

Syllabus and Chapter wise division of marks (2024-25)

Class- 11th **Subject: Chemistry** **Code:856**

General Instructions:

1. There will be an Annual Examination based on the entire syllabus.
2. The annual examination (Theory) will be of 70 Marks whereas Practical examination will be of 30 marks (Internal). Therefore, Total annual evaluation (70+30) will be of 100 marks.
3. For Practical examination the criteria are as follows:

Total Time: 3 Hours

Evaluation Scheme	**Marks**
Marks allocated for Internal Assessment 1. Student Assessment Test Weightage of marks (06 marks of SAT, 02 marks of half yearly test, 02 marks for attendance and classroom participation) 2. Practical file/ Record 3. Project Record	**15** 10 03 02
Marks allocated for Annual Examination	**15**
Volumetric Analysis	05
Salt Analysis	04
Activity (One from Syllabus)	03
Viva Voce	03
Total marks	**30**

Course Structure (2024-25)

Class- 11th **Subject: Chemistry** **Code:856**

Sr. No.	Name of Chapter	Marks
1	Unit 1: Some Basic Concepts of Chemistry	7
2	Unit 2: Structure of Atom	8
3	Unit 3: Classification of Elements and Periodicity in properties	6
4	Unit 4: Chemical Bonding and Molecular Structure	9
5	Unit 5: Chemical Thermodynamics	7
6	Unit 6: Equilibrium	7
7	Unit 7: Redox Reactions	6
8	Unit 8: Organic Chemistry: Some Basic Principles and Techniques.	10
9	Unit 9: Hydrocarbons	10
	Total	**70**
	Practical	**30**
	Grand Total	**100**

Unit 1: Some Basic Concepts of Chemistry

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 2: Structure of Atom

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 sub shells, 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 3: Classification of Elements and Periodicity in Properties

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 4: Chemical Bonding and Molecular Structure

Valence electrons, ionic bond, covalent bond, bond parameters, Lewis's 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 5: Thermodynamics

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, Gibb's energy change for spontaneous and non- spontaneous processes, criteria for equilibrium. Third law of thermodynamics (brief introduction).

Unit 6: Equilibrium

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

Unit 7: Redox Reactions

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 8: Organic Chemistry -Some Basic Principles and Techniques

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.

Unit 9: Hydrocarbons

Classification of Hydrocarbons Aliphatic Hydrocarbons: Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. Alkenes - Nomenclature, the 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, the 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 the functional group in mono-substituted benzene. Carcinogenicity and toxicity.

PRACTICALS:

1. Basic Laboratory Techniques.
2. Purification of sample of a compound by crystallisation.
3. Study of shift in equilibrium in the reaction of ferric ions and thiocyanate ions by increasing the concentration of any one of these ions.
4. Determine the pH of some fruit juices.
5. Study the variation in pH by common ion effect in the case of weak acids and weak bases.
6. Determination of the concentration (strength) of a given sodium hydroxide solution by titrating it against a standard solution of oxalic acid
7. Determination of the strength of a given solution of dilute hydrochloric acid by titrating it against a standard solution of sodium carbonate
8. Detect one cation and one anion in the given salt from the following ions:

   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-}, SO_3^{2-} , SO_4^{2-} , NO^{2-} , NO^{3-} , Cl^-, Br^-, I^-, PO_4^{3-} , $C_2O_4^{2-}$, CH_3COO^-. (Insoluble salts to be excluded)

Monthwise Syllabus Teaching Plan (2024-25)

Class- 11th **Subject: Chemistry** **Code:856**

Month	Chapter / Topic	Teaching Periods	Revision periods	Practical Periods
April	Unit 1: Some Basic Concepts of Chemistry Practical: Basic Laboratory Techniques.	16	4	8
May	Unit 2: Structure of Atom Practical: Purification of sample of a compound by crystallisation.	20	5	4
June	Summer Vacations:- Investigatory Projects, charts and working innovative models should be given during the summer vacations			
July	Unit 3: Classification of Elements and Periodicity in properties	12	4	
August	Unit 4: Chemical Bonding and Molecular Structure	20	5	
September	Unit 5: Thermodynamics	18	4	
	Half Yearly Exam			
October	Unit 6: Equilibrium Practical: Study of shift in equilibrium in the reaction of ferric ion and thiocyanate ions.	14	4	2

	Practical: To determine the pH of some fruit juices. Practical: Study the variation in pH by common ion effect in the case of weak acids and weak bases.			1 2
	Unit 7: Redox Reactions Practical: Determination of the concentration (strength) of a given sodium hydroxide solution by titrating it against a standard solution of oxalic acid. Practical: Determination of the strength of a given solution of dilute hydrochloric acid by titrating it against a standard solution of sodium carbonate Practical: Detect one cation and one anion in the given salt	8	2	4 4 8
November	Unit 8: Organic Chemistry: Some Basic Principles and Techniques.	17	4	
December	Unit 9: Hydrocarbons	20	3	
January	Revision	--	--	--

February	Revision and Annual Practical Exams	--	--	--
March	Annual Exams			

Note:

- **Subject teachers are advised to direct the students to prepare notebook of the Terminology/Definitional Words used in the chapters for enhancement of vocabulary for clarity of the concept.**

- **The NCERT textbooks present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.**

Prescribed Books:

1. Chemistry Part-I and Part II, Class XI, BSEH Publications © NCERT

2. Laboratory Manual of Chemistry, Class XI published by (NCERT)

Question Paper Design(2024-25)

Class- 11th **Subject: Chemistry** **Code: 856**

Time: 3 Hours

Type of Question	Marks	Number of Question	Description	Total Marks
Objective Questions	1	18	09 Multiple Choice Questions, 03 Fill in the blanks 03 One Word Answer based. 03 Assertion-Reason Questions	18
Very Short Answer Type Question	2	7	Internal choice will be given in any 3 questions	14
Short Answer Type Question	3	5	Internal choice will be given in any 2 questions	15
Case Study	4	2	Internal choice will be given only in one part of both questions	8
Long Answer Type Question	5	3	Internal choice will be given in all the questions and may be given in the parts	15
Total		**35**		**70**

Haryana Board Study Material

- Syllabus
- Model Papers
- Previous Year Question Papers
- Books
- Notes