CONTENTS

1.	THE	LANGUAGE OF CHEMISTRY	
	1.1	Introduction	1
	1.2	Chemical symbols	2
	1.3	Formula	2
	1.4	Valency	3
	1.5	Radicals	4
	1.6	Writing chemical formulae	6
	1.7	Naming certain compounds	7
	1.8	To calculate the valency from the formula	8
	1.9	Chemical equation	9
	1.10	Relative atomic mass (Atomic weight)	14
	1.11	Relative molecular mass (molecular weight)	14
	1.12	Percentage composition	15
	1.13	Empirical formula of a compound	16
2.	CHE	EMICAL CHANGES AND REACTIONS	
	2.1	Chemical reaction	20
	2.2	Characteristics of chemical reactions	21
	2.3	Types of chemical change or chemical reaction	23
	2.4	Energy change in chemical reactions	28
3.	WAT	TER	de com
3.		BRINGS NEW FOR TWO BY THE SECOND FOR THE SECOND SEC	31
3.	3.1	Introduction	31 32
3.	3.1 3.2	Introduction Physical properties of water	32
3.	3.1 3.2 3.3	Introduction Physical properties of water Water is universal solvent	
3.	3.1 3.2 3.3 3.4.	Introduction Physical properties of water	32 33
3.	3.1 3.2 3.3 3.4. 3.5	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution	32 33 35
3.	3.1 3.2 3.3 3.4. 3.5 3.6	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution	32 33 35 36
3.	3.1 3.2 3.3 3.4. 3.5	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility	32 33 35 36 37
3.	3.1 3.2 3.3 3.4. 3.5 3.6 3.7	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization	32 33 35 36 37 37
3.	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances	32 33 35 36 37 37 37
3.	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization	32 33 35 36 37 37 39 40
3.	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9 3.10	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances Properties	32 33 35 36 37 37 39 40 42
3.	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9 3.10 3.11	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances Properties Drying and dehydrating agents	32 33 35 36 37 37 39 40 42 43
	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances Properties Drying and dehydrating agents Soft and hard water Types of hardness temporary and permanent hardness	32 33 35 36 37 37 39 40 42 43 45
4.	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances Properties Drying and dehydrating agents Soft and hard water	32 33 35 36 37 37 39 40 42 43 45
	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances Properties Drying and dehydrating agents Soft and hard water Types of hardness temporary and permanent hardness	32 33 35 36 37 37 39 40 42 43 45
	3.1 3.2 3.3 3.4. 3.5 3.6 3.7 3.8 3.9 3.10 3.11 3.12 3.13	Introduction Physical properties of water Water is universal solvent Solutions as mixtures of solids in water Saturated solution Concentration of a solution Solubility Crystals and crystallization Hydrated and anhydrous substances Properties Drying and dehydrating agents Soft and hard water Types of hardness temporary and permanent hardness MIC STRUCTURE AND CHEMICAL BONDING	32 33 35 36 37 37 39 40 42 43 45 46

4.4	Discovery of protons	51
4.5	Discovery of nucleus	52
4.6	Bohr's atomic model	53
4.7	Discovery of neutrons	54
4.8	Atom — Its structure	55
4.9	Atomic number [Z]	55
4.10	Distribution of electrons in the orbits — Bohr-bury scheme	56
4.11	Valence electrons	59
4.12	Reason for chemical activity of an atom	60
4.13	Isotopes	60
4.14	Electrovalent (or ionic) bond	64
4.15	Covalent (molecular) bond	67
5. TH	HE PERIODIC TABLE	
5.1	Reasons for classification of elements	75
5.2	Dobereiner's triads	75
5.3	Newland's law of Octaves	76
5.4	Mendeleev's Periodic table	77
5.5	Atomic number as basis for modern periodic law	78
5.6	Periodicity in the modern periodic table	81
5.7	Types of elements	82
5.8	Merits of the modern periodic table	83
5.9	Deffects of the modern periodic table	83
5.10	General trends of the modern periodic table	83
5.11	Study of specific groups	86
5.12	Use of periodic table	89
6. ST	UDY OF THE FIRST LEMENT — HYDROGEN	
6.1	Position of hydrogen in periodic table	93
6.2	Similarities between hydrogen and alkali metals	94
6.3	Similarities between hydrogen and halogens	94
6.4	Discovery	95
6.5	Occurrence	95
6.6	Preparation of hydrogen	95
6.7	Application of activity series in the preparation of hydrogen	97
6.8	Laboratory preparation of hydrogen	100
6.9	Manufacture of hydrogen	101
6.10	Properties of hydrogen	103
6.11	Uses of hydrogen	104
6.12	Oxidation and reduction	106

7. STUDY OF GAS LAWS					
7.1	Introduction	111			
7.2	behaviour and characteristic properties of gases	111			
7.3	Molecular motion: Relationship of temperature, pressure and volume	112			
7.4	The gas laws	112			
7.5	Pressure and volume relationship in gases	113			
7.6	Temperature — Volume relationship in gases	116			
7.7	Absolute zero	117			
7.8	Absolute or Kelvin scale of temperature	117			
7.9	Conversion of temperature from celsius scale to kelvin scale and vice-versa	117			
7.10	The gas equation (Pressure, volume and temperature relationship)	119			
7.11	Standard Temperature and Pressure (S.T.P.)	119			
7.12	The effect of moisture on pressure	119			
8. A	ATMOSPHERIC POLLUTION				
8.1	Introduction	125			
8.2	Air pollution	126			
8.3	Acid rain	128			
8.4	Global warming	130			
8.5	Ozone	132			
9. PRACTICAL WORK					
I.	Recognition and identification of gases	136			
II.	Action of heat on a given (unknown) substance	141			
Ш.	Action of dilute sulphuric acid on a given substance.	143			
IV.	Flame test	144			
V.	Simple experiments based on hard water and soft water	146			
VI.	Water pollution	148			
REV	IEW QUESTIONS	152			
GLO	SSARY	154			
PAPI	160				
PAPI	166				
PAP	169				