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| CHEMISTRY FORM THREE TERM ONE 2020 | | | | | | | |
| *WK* ***NO.*** | ***L/***  ***NO*** | TOPIC/ ***SUBTOPIC*** | ***LESSON / SPECIFIC*** OBJECTIVES | ***TEACHING / LEARNING*** ACTIVITIES | MATERIALS ***/*** RESOURCES | ***REF*** | REMARKS |
| 1 | 1 | GAS LAWS Boyle’s law. | *By the end of the lesson, the learner should be able to:*  State Boyle’s law.  Explain Boyle’s law using kinetic theory of matter. | Teacher demonstration – Use syringes / pumps to show variation of volume with pressure.  Teacher asks probing questions leading to statement of the law.  Discuss the cause of build-up-in pressure. | Chart  Volume-pressure relationship.  Syringes. | ***K.L.B. BK III***  *PP. 1-2*  ***Longhorn Book III***  *PP 1 -2* |  |
| 2 | Boyle’s law: -  Equation and graphical representation. | Represent Boyle’s law mathematically and graphically. | Q/A: relation between volume and pressure mathematically and graphically.  Derive the relation P1V1=P2V2, and sketch graphs to illustrate Boyle’s law.  Worked examples.  Assignment. |  | *K.L.B. BK III* PP. 3-4 *Longhorn Book III*  *PP 3-5* |  |
| 3 & 4 | Boyle’s law:  Numerical questions. | Solve further problems involving Boyle’s law. | Supervised exercise: Volume in cm³, m³, litres, and pressure in Pa, mmHg, cmHg, atmospheres.  Assignment. | Calculators. | *K.L.B. BK III*  *PP. 4-5*  *Longhorn Book III PP 6-8* |  |
| 5 | Boyle’s law:  Interpretation of graphs. | Plot and intepret graphs involving pressure and volume of gases. | Completing tables and plotting graphs.  Interpret the plotted graphs.  Make deductions from the graphs. | Graph papers. | *K.L.B.*  *BK III*  *PP. 4-5* |  |
| 2 | 1 | Charles’ law. | *By the end of the lesson, the learner should be able to:*  State Charles’ law.  Explain Charles’ law using kinetic theory of matter. | Teacher demonstration:- To show expansion of air when heated and contraction when pressure is constant.  Explain increase in volume when temperature is raised.  Q/A: - relation between volume and temperature, leading to Charles’ law. | Coloured water,  Glass tube,  Warm water,  Cork and  Flask. | ***.K.L.B.***  ***BK III*** *P. 6*  *Longhorn Book III PP 9-11* |  |
| 2,3 | Temperature in Degree Celsius and Kelvin.  Equation and graphs from Charles’ law. | Convert temperature in degree Celsius to Kelvin and vice-versa. | Teacher explains inter-conversion of the units.  Students complete a table of temperature in the two units. |  | ***K.L.B.***  ***BK III*** *P. 10*  *Longhorn Book III P 11* |  |
| 3 | Charles’ law- equation and graphical representation. | Express Charles’ law with equations.  Give a graphical representation of Charles’ law. | Derive equations from volume and temperature relationship.  Exposition: - Teacher exposes a volume-temperature graph and extrapolates it to obtain the absolute temperature. The definition of absolute temperature is exposed. |  | ***K.L.B. BK III***  *PP. 6-7*  *Longhorn Book III P 10* |  |
| 4 | Numerical questions on Charles’ Law. | Solve numerical problems based on Charles’ Law. | Worked examples.  Supervised exercise.  Assignment. | Calculators. | ***K.L.B.***  ***BK III*** *P. 12*  *Longhorn Book III PP 12-14* |  |
| 5 | Combined Gas Law. | Derive the Gas Law.  Derive the combined gas law equation.  Solve numerical problems using the equation. | Q/A: - Combining Boyle’s and Charles’ Laws.  Worked examples. | Calculators. | ***K.L.B.***  ***BK III*** *P. 12*  *Longhorn Book III PP 14-16* |  |
| 3 | 1 | Standard conditions,  S.T.P. conditions and R.T.P. conditions. | State standard conditions of temperature and pressure of an ideal gas.  State room temperature and pressure of a gas.  Use standard conditions in problem solving. | Exposition of s.t.p. and r.t.p.  Problem solving. |  | ***K.L.B.***  ***BK III*** *P. 14* |  |
| 3 | 2 | Diffusion. | *By the end of the lesson, the learner should be able to:*  Define diffusion.  Describe experiments to show diffusion. | Group experiments.  Diffusion of KMnO4 crystals, concentrated ammonia solution. | KMnO4 crystals,  Litmus papers. | ***K.L.B. BK III***  *PP. 14-15*  *Longhorn Book III P 19* |  |
| 3 | Rates of diffusion. | Compare rates of diffusion of ammonia gas and hydrogen chloride in air. | Teacher demonstration: - To deduce rate of diffusion of ammonia gas and hydrogen chloride.  Q/A: - Students calculate ratio of rates of diffusion of the gases. |  | ***K.L.B.***  ***BK III***  *PP. 18-19*  *Longhorn Book III 21* |  |
| 4 | Graham’s Law. | State Graham’s Law.  Represent Graham’s Law mathematically. | Review the experimental results above.  Compare the rates of diffusion with density of a gas leading to Graham’s Law.  Q/A: - Graham’s Law using mathematical expressions.  Worked examples. |  | ***K.L.B. BK III***  *PP. 22-23*  *Longhorn Book III PP 22-24* |  |
| 5 | Graham’s Law. | Carry out numerical tasks. | Solve problems involving RMM, equal volumes of the gases involved.  Supervised practice.  Assignment. | Calculators | ***K.L.B. BK III***  *PP. 24-26*  *Longhorn Book III PP 22-24* |  |
| 4 | 1 | THE MOLE Mole, molar mass and R.A.M. | Define the term mole as a quantity of measurement.  Relate the mole to R.A.M and molar mass. | Discuss various analogies that lead to the definition of the mole.  Expose the meaning of R.A.M., Avogadro’s constant and molar mass. | Chart- table of molar masses of elements. | ***K.L.B. BK III***  *PP. 27-31*  *Longhorn*  *Book III*  *PP 34-35* |  |
| 2 | Number of moles in a substance. | Calculate number of moles in a given mass of a substance. | Worked examples.  Supervised practice. |  | ***K.L.B .BK III***  *P. 34*  *Longhorn*  *BK III*  *PP 39-40* |  |
| 3 & 4 | Relative molecular mass  &  Relative formula mass. | Define relative molecular mass.  Calculate RMM of a compound. | Q/A: - Review formulae of compounds.  Complete a table of compounds and their molecular / formula mass. | Calculators. | ***K.L.B.BK III***  *PP. 34-35*  *Longhorn Book III PP 44-60* |  |
| 5 | Moles and Avogadro’s number. | Calculate number of particles in a given number of moles. | Review standard form of numbers.  Worked examples.  Supervised exercise. | Calculators. | ***K.L.B.BK III***  *PP. 3132*  *Longhorn*  *Book III*  *PP 30-31* |  |
| 5 | 1 & 2 | Empirical Formula. | *By the end of the lesson, the learner should be able to:*  Define the term empirical formula of a compound.  Determine empirical formula experimentally. | Group experiments: - Burning magnesium / copper in air to obtain mass of metal and mass of oxygen involved.  Determine mole ratio, hence the empirical formula. |  | ***K.L.B.BK III***  *PP. 41*  *Longhorn Book III PP 64-71* |  |
| 3 | Empirical Formula. | Determine empirical formula of a compound given percentage composition by mass. | Worked examples.  Supervised practice.  Assignment. |  | ***K.L.B.***  ***BK III*** *P. 43*  *Longhorn Book III PP 66-71* |  |
| 4 & 5 | Molecular formula. | Define molecular formula of a compound.  Find molecular formula given percentage composition of a compound by mass. | Worked examples.  Supervised practice. | Calculators. | ***K.L.B.BK III***  *P. 45*  *Longhorn*  *Book III*  *PP 73-75* |  |
| 6 | 1 | Concentration of a solution. | Define concentration of a solution.  Find concentration of a solution in grams/litre and moles/litre. | Q/A: - Equivalent ratios, e.g. 4g dissolved in 500cm³ and  8g in 1 litre.  Worked examples on concentration of solutions. |  | ***K.L.B. BK III***  *PP. 46-48*  *Longhorn Book III PP 76-81* |  |
| 2 | Molarity of a solution. | Define molarity of a solution.  Find molarity of a solution in M/dm³ | Teacher explains that molarity of a solution is given in moles of the solute per litre.  Worked examples.  Supervised exercise. |  | *K.L.B. BK III*  *PP. 48-49*  *Longhorn*  *Book III*  *PP 76-81* |  |
| 3 | Preparation of molar solutions. | Define molar solutions.  Prepare molar solutions. | Q/A: - Description of preparation of molar solutions. | Volumetric flasks, teat droppers/wash bottle.  Sodium hydrogen pellets.  Weighing balance. | *K.L.B. BK III*  *PP. 50-51*  *Longhorn*  *Book III*  *PP 78-81* |  |
|  | 4 | Calculators on molar solutions. | Solve numerical calculations on molar solutions.  Problems on molar solutions. | Worked examples.  Supervised exercise.  Assignment. |  | *K.L.B. BK III*  *P 51*  *Longhorn Book III PP 76-81* |  |
| 5 | Dilution of solutions. | Calculate molarity of a solution after dilution. | Group experiments.  Calculations. |  | *K.L.B. BK III*  *PP. 76-81* |  |
| 7 | 1 | Stoichiometry of a chemical reaction. | To determine mole ratio of given reactions. | Group experiments: - Determine masses, hence moles of reacting CuSO4 solution and iron metal. | CuSO4 solution and iron metal. | *K.L.B. BK III*  *P. 56*  *Longhorn Book III PP 87-92* |  |
| 2 | Stoichiometric equations. | To define a stoichiometric equation. | To write stoichiometric equations of the above reactions. |  | *K.L.B. BK III*  *Longhorn Book III PP 14-16*  *PP. 88-93* |  |
| 3,4 | Stoichiometric equations of various reactions. | To investigate and determine Stoichiometric equations of various reactions. | Class experiments.  Problem solving. |  | *K.L.B. BK III*  *P. 62* |  |
| 5 | **C.A.T.** | |  |  |  |  |
| 8 | 1 | **Volumetric Analysis**.  Apparatus used in titration experiments. | To use and read a pipette and a burette. | Discussion and practical use of the apparatus.  *Emphasis is laid on need to sterilize the apparatus after use.* | Pipettes  Burettes. | *K.L.B. BK III*  *PP. 63-64*  *Longhorn*  *Book III*  *PP 104-8* |  |
| 2 | Titration process. | To define titration as a process.  Define a titration end-point. | Review by Q/A: -  -Indicators and colour changes.  -Choice of indicators.  -Balanced chemical equations.  Discuss characteristics of a good titre, when an an-end point is attained. | Indicators  Suitable acid and base. | *K.L.B.*  *BK III*  *PP. 64-67*  *Longhorn*  *Book III*  *PP 108-114* |  |
| 3,4 | Titration experiment  (Neutralization reaction) | To carry out a titration experiment and obtain accurate results. | Class experiments: - To neutralize HCl with NaOH solution.  Fill in a table of results.  Find the average base used. |  | *K.L.B. BK III*  *P. 66*  *Longhorn Book III PP 108-114* |  |
| 5 | Titration experiment  (Neutralization reaction) | To carry out calculations from experimental results. | Step-by-step calculations. | Calculators. | *K.L.B. BK III*  *P 66*  *Longhorn Book III PP 108-114* |  |
| 9 | 1 | Basicity of an acid. | To define basicity of an acid. | Complete a table of number of replaceable hydrogen ions of an acid; hence define basicity of an acid.  Write corresponding ionic equations. |  | *K.L.B. BK III*  *P. 73* |  |
| 2 | Standardization of HCl. | To define standardization of HCl. | Class experiments. | Dilute HCl, Na2CO3 solutions. | *K.L.B. BK III*  *PP. 74-75* |  |
| 3 | Concentration of HCl. | To calculate concentration of HCl from experimental results. | Calculations & supervised practice. |  | *K.L.B. BK III*  *PP. 74-75* |  |
| 4 & 5 | Redox Titration Reactions. | To standardize a solution with an iron (II) salt. | Experiment and calculations. | Potassium Magnate  (VII) | *K.L.B. BK III*  *PP. 74-75*  *Longhorn*  *Book III*  *PP 114-115* |  |
| 10 | 1 | Water of crystallization. | To determine amount of water of crystallization in ammonium iron sulphate crystals. | Teacher exposes the formula of water of crystallization.  Class experiment.  Filling in a table of results. | Ammonium  Iron (II)  Sulphate crystals.  Dilute sulphuric (VI) acid. | *K.L.B. BK III*  *P. 76* |  |
| 2 | Formula mass of ammonium iron (II) sulphate. | To find formula mass of ammonium iron (II) sulphate. | Calculations from experimental results. |  | *K.L.B. BK III*  *PP. 76 -77* |  |
| 3 | Formula mass of a given salt. | To solve numerical problems involving water of crystallization. | Problem solving from sample results. |  | *K.L.B. BK III*  *P.77* |  |
| 4 | Atomicity of gases. | To define atomicity of gases. | Review by Q/A atoms and molecules; hence the definition.  Discuss a table of gases and their atomicity. |  | *K.L.B. BK III*  *PP. 78 -80*  *Longhorn BK III PP 126-128* |  |
| 5 | Mass and volume of gases. | To determine mass and volume of gases. | Teacher demonstration: - Determining mass of known volumes of oxygen / CO2. | Lubricated syringes  Oxygen/  CO2. | *K.L.B. BK III*  *P. 81*  *Longhorn BK III*  *PP 126-127* |  |
| 11 | 1 | Molar gas volume. | To define molar gas volume. | Use the above results to describe volume of one mole of a gas.  Discuss molar gas volume at R.T.P and S.T.P conditions. |  | *K.L.B. BK III*  *79 – 80*  *Longhorn*  *Book III*  *PP 126-127* |  |
| 2 | Combining volumes of gases. | To compare combining volumes of two reacting gases. | Teacher demonstration: - Determining volumes of reacting gases; hence deduce volume rations. |  | *K.L.B BK III*  *P. 82* |  |
| 3 & 4 | Gay Lussac’s Law. | To state Gay Lussac’s Law.  To compare Gay Lussac’s Law with Avogadro’s Law.  To solve numericals using Gay Lussac’s Law. | Teacher exposes the law; and compares it with Gay Lussac’s Law.  Worked examples.  Supervised practice. |  | *K.L.B. BK III*  *P. 85*  *Longhorn*  *Book III*  *PP 129-131* |  |
| 5 | ***END OF TERM ASSESSMENT TEST*** | | | | | |

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| *FORM THREE CHEMISTRY TERM TWO YEAR 2020* | | | | | | | |
| 1 | 1 | **ORGANIC CHEMISTRY (I**)    Hydrocarbons. | To define organic Chemistry.  To define a hydrocarbon.  To identify groups of hydrocarbons.  To describe the carbon atom. | Discuss composition of the carbon atom; hence deduce number of valence electrons.  Exposition of new terms. |  | K.L.B. BK III P. 92 *Longhorn*  *Book III*  *P 135* |  |
| 2 | Alkanes. | To identify various alkanes.  To list sources of alkanes.  To state uses of different fractions of crude oil.  To define cracking of alkanes. | Expose various alkanes.  Discuss the biomass digester, fractional distillation of crude oil and uses of the fractions.  Discuss the cracking process. | Chart of biomass digester. | K.L.B. BK III  *PP. 93-94*  *Longhorn*  *Book III*  *PP 135-6* |  |
| 3 | Naming Alkanes. | To identify various alkanes.  To define a homologous series. | Discussion and exposition of new concepts. |  | K.L.B. BK III  *PP. 94-98*  *Longhorn*  *Book III*  *PP 136-139* |  |
| 4 | Members of Alkane series. | To name members of alkane series and identify their characteristics.  To draw the structures of alkane series. | Discussion and exposition of new concepts. | Chart- structure of alkanes. | K.L.B. BK III  *PP. 97-99*  *Longhorn Book III*  *PP 137-9* |  |
| 5 | Isomerism in alkanes. | To draw and name isomers of simple hydrocarbons. | Discussion and exposition of new concepts. | Models. | K.L.B. BK III  *PP. 101-102 Longhorn Book III*  *PP 141-2* |  |
| 2 | 1 | Laboratory preparation of a given alkane. | To describe laboratory preparation of a given alkane.  To state physical properties of the gases prepared. | Teacher demonstration.  Discussion. | Sodium ethanoate, sodalime,  Pestle and mortar. | K.L.B. BK III  *P. 103*  *Longhorn*  *Book III*  *PP 146* |  |
| 2 | 2 | Trend in physical properties of alkanes. | To describe the trend in physical properties of alkanes. | Study a table of comparative properties of alkanes.  Make deductions from the table. |  | K.L.B. BK III  *P. 105*  *Longhorn*  *Book III*  *PP 148-9* |  |
| 3 | Chemical properties of alkanes. | Describe chemical properties of alkanes. | Discussion  Examples of balanced equations. |  | K.L.B. BK III  *P. 107*  *Longhorn*  *Book III*  *PP 148-9* |  |
| 4 | Substitution reactions involving alkanes.  Uses of alkanes. | To describe substitution reactions involving alkanes.  To list down uses of alkanes. | Discussion  Teacher elucidates uses of alkanes. |  | K.L.B. BK III  *P. 108*  *Longhorn*  *Book III*  *PP 149-50* |  |
| 5 | Alkenes.  Molecular formulae of alkenes. | To write molecular formulae of alkenes. | Examine table of members of alkenes.  To identify members of alkene series. |  | K.L.B. BK III  *PP 153-4* |  |
| 3 | 1 | Naming alkenes. | To name various alkenes. | Q/Q: Nomenclature in alkenes.  Compare alkenes; hence deduce names of various alkenes. |  | K.L.B. BK III  *PP. 110-113*  *Longhorn*  *Book III*  *PP 154-6* |  |
| 2 | Alkene isomerism. | Differentiate between branching and positional isomerism. | Discussion and drawing of molecular structures. |  | K.L.B. BK III  *P. 113*  *Longhorn*  *Book III*  *PP 158-60* |  |
| 3 | Preparing ethene in the lab. | To describe lab preparation of ethene. | Teacher demonstration: - Carry out tests on ethene as students note down the observations in a table. |  | K.L.B. BK III  *P 162* |  |
| 4 | Physical properties of ethene. | To describe physical properties of ethene and other alkenes. | To discuss physical properties of ethene and other alkenes. |  | K.L.B. BK III  *PP. 116-117*  *Longhorn Book III*  *PP 126-129*  *165-6* |  |
| 5 | Chemical properties of ethene. | To explain halogenation and hydrogenation reactions. | Discussion and drawing structures. |  | *KLB BK III*  *PP. 118-119*  *Longhorn*  *Book III*  *PP 166-8* |  |
| 4 | 1 | Alkenes and oxidizing agents. | To describe reactions of alkenes with oxidizing agents. | Review the double bonds in alkenes.  Review reduction process, oxidizing agent.  Discuss reactions of alkenes with conc. H2SO4, acidified potassium chromate.  Expose hydrolysis process. |  | K.L.B. BK III  *PP. 120-121*  *Longhorn*  *Book III*  *PP 166-8* |  |
| 2 | Uses of alkenes  &  Topic review. | To list down uses of alkenes. | Teacher elucidates uses of alkenes.  Assignment. |  | K.L.B. BK III  *P. 121 Longhorn Book*  *PP 170-1* |  |
| 4 | 3,4 | Alkynes. Nomenclature. | To identify various alkynes.  To name and draw structures of alkynes. | Discuss a table of members of alkynes.  Review naming of alkanes and alkene and compare this with naming of alkynes. |  | K.L.B. BK III  *P. 122-123*  *Longhorn*  *Book III*  *PP 126-129 171-5* |  |
| 5 | Isomerism in alkynes. | To draw structure showing positional and branching isomerism. | Discussion and drawing structures. |  | K.L.B. BK III  *PP. 124-125*  *Longhorn*  *Book III*  *PP 176-8* |  |
| 5 | 1 | Physical properties of ethyne. | To list down physical properties of ethyne. | Teacher demonstration: Preparation of ethyne.  Deduce properties of other alkynes. |  | K.L.B. BK III  *PP. 125-126*  *Longhorn*  *Book III*  *PP 197-80* |  |
| 2 | Chemical properties of ethyne. | To describe combustion, halogenation and hydrogenation processes. | Discussion and writing of equations. |  | K.L.B. BK III  *PP. 127-129*  *Longhorn Book III*  *PP 180-184* |  |
|  | 3 | Tests for alkynes.  Uses of alkynes. | To describe tests for alkynes and state uses of alkynes. | Discussion and explanations.  Assignment. |  | K.L.B. BK III  *P.130*  *Longhorn Book III*  *PP 180-84* |  |
| 4 | NITROGEN & ITS COMPOUNDS.  Isolation of nitrogen from air. | Describe isolation of nitrogen from air. | Teacher demonstration, explanations and equations. | Aspirator, copper turnings, gas jar, combustion tube, trogh. | K.L.B. BK III  *PP. 134-135*  *Longhorn Book*  *P 186* |  |
| 5 | Industrial production of nitrogen. | Describe industrial production of nitrogen. | Discussion and description.  Drawing schematic diagram for the process. |  | K.L.B. BK III  *PP.135-136*  *Longhorn Book*  *PP 188-9* |  |
| 6 | 1 | Lab. preparation of nitrogen. | Describe lab preparation of nitrogen. | Teacher demonstration:  Students’ record observations made from tests on the gas.  Writing equations of reactions. | Ammonium chloride, sodium nitrate | K.L.B. BK III  *P. 137*  *Longhorn*  *Book III*  *P 190-1* |  |
| 2 | Physical and chemical properties of nitrogen.  Uses of nitrogen. | State physical and chemical properties of nitrogen.  List down uses of nitrogen. | Discussion and writing equations. |  | K.L.B. BK III  *P. 138*  *Longhorn*  *Book III*  *PP 191-2* |  |
| 6 | 3,4 | Nitrogen (I) oxide.  Lab preparation. | To describe Nitrogen (I) oxide. | Teacher demonstration: -  Carry out tests on the gas.  Students record observations in a table.  Guided discussion. | Ammonium nitrate. | K.L.B. BK III  *PP. 139-141*  *Longhorn*  *Book III*  *PP 195-6* |  |
| 5 | **C.A.T.** | |  |  |  |  |
| 7 | 1 | Properties and uses of Nitrogen (I) oxide. | To list down physical properties of nitrogen (I) oxide.  To describe chemical properties of nitrogen (I) oxide.  To list down uses of nitrogen (I) oxide. | Q/A: Deductions from tests carried out.  Discussion of chemical properties and writing of equations.  Teacher elucidates uses of nitrogen (1) oxide. |  | K.L.B. BK III  *P. 141*  *Longhorn*  *Book III*  *PP 191-2* |  |
| 2 | Nitrogen (II) oxide.  Lab preparation. | To describe lab preparation of nitrogen (II) oxide. | Class experiment: Preparation and carrying out tests on the gas.  Observations recorded in a table. | Dil nitric acid, copper turnings. | K.L.B. BK III  *P. 142*  *Longhorn*  *Book III*  *PP 200-1* |  |
| 3 | Properties of the gas. | To list down physical properties of nitrogen (II) oxide  To describe chemical properties of nitrogen (11) oxide | Q/A: Deductions from tests carried out.  Discussion of chemical properties and writing of equations.  Carry out a confirmatory test for the presence of the gas. |  | K.L.B.  BK III  *P. 143*  *Longhorn*  *Book III*  *PP 192-200* |  |
| 4 | Nitrogen (1V) oxide  Lab preparation. | To describe nitrogen (IV) oxide lab preparation. | Teacher demonstration: - Preparation of the gas and corresponding equation.  Tests on the gas and make observations. | Conc. nitric acid, copper turnings. | K.L.B. BK III  *PP. 144-145* |  |
| 5 | Properties of Nitrogen (IV) oxide. | To list down physical properties of nitrogen (IV) oxide  To describe chemical properties of nitrogen (IV) oxide  To state uses of nitrogen (1V) oxide. | Deduce physical properties from the table of observations.  To describe chemical properties from the table of observations.  Discuss uses of nitrogen (1V) oxide. |  | K.L.B. BK III  *PP. 144-147*  *Longhorn*  *Book III*  *P 204* |  |
| 8 | 1 | Ammonia.    Lab preparation of ammonia. | To describe lab preparation of ammonia | Q/A: Structure of ammonia.  Group experiments: Preparation of ammonia.  Tests on the gas. | Ca(OH)2, NH4Cl Solutions, CaO, litmus papers..M THREE CHEMISTRY TERM TWO 20.... | K.L.B. BK III  *PP. 147-148* |  |
| 8 | 2 | Properties of ammonia. | To list down physical properties of ammonia. | Deduce physical properties from the observations above.  Discuss chemical properties from the observations above.  Write down chemical equations. |  | K.L.B. BK III  *P. 150* |  |
| 3 | Solubility of ammonia. | To describe an experiment to determine solubility of ammonia. | Teacher demonstration.  Discussion. |  | K.L.B. BK III  *P. 150* |  |
| 4 & 5 | Reaction of ammonia with metal ions. | To prepare aqueous solution of ammonia.  To carry out tests of aqueous ammonia on metal ions. | Teacher demonstration: - Preparation of aqueous solution of ammonia.  Class experiments: -  Students record observations when drops of aqueous ammonia are added, then in excess. | 2 cm³ Solutions containing various metal ions. | K.L.B.  BK III  *PP. 152-153* |  |
| 9 | 1 | Ionic equations of above reactions. | To write iIonic equations of above reactions. | Discuss precipitation of metal hydroxides by aqueous ammonia.  Confirmatory tests for various concentrations. |  | K.L.B. BK III  *P.154*  *Longhorn BK III*  *P 223* |  |
| 2 | Burning ammonia in the air. | To describe burning ammonia in the air. | Teacher demonstration  Discussion  Chemical equations of reactions. | Conc. Ammonium solution  Hot platinum rod  Oxygen. | K.L.B.  BK III  *P. 158*  *Longhorn*  *Book III*  *PP 219* |  |
| 3 | Reaction of ammonia with copper (II) Oxide. | To name products formed when ammonia reacts with hot CuCl2 solid.  To explain reducing properties of ammonia. | Teacher demonstration and discussion.  Write down equations for the reactions. | Granular CuCl2  Combustion tube,  Dry ammonia  U-tube  Gas jar. | K.L.B.  BK III  *P. 158* |  |
| 9 | 4 | Haber process. | Identify raw materials for Haber process and how they are obtained in large scale.  Discuss the Haber process.  Represent Haber process in a schematic diagram. | Discussion and explanations. | Chart- schematic diagram. | K.L.B. BK III  *PP. 159-160*  *225-226* |  |
| 5 | Uses of ammonia. | To list down uses of ammonia.  To list down nitrogenous fertilizers. | Teacher elucidates uses of ammonia and nitrogenous fertilizers. |  | K.L.B. BK III  *P. 161*  *Longhorn*  *Book III*  *PP 126 -226* |  |
| 10 | 1 | Nitric acid.  Lab preparation. | To describe lab preparation of nitric acid. | Teacher demonstration.  Write equations of reaction.  Discussion. | Retort stand  Conc. H2SO4  KNO3 | K.L.B. BK III  *P. 163* |  |
| 2 | Nitric acid  Industrial manufacture. | To describe industrial manufacture of nitric acid. | Discussion and writing equations. | Chart  Schematic diagram. | K.L.B. BK III  *P. 164* |  |
| 3 & 4 | Reaction of dilute Nitric acid with metals. | To describe reaction of dilute nitric acid with metals.  To write equations of reactions of dilute nitric acid with metals. | Class experiment:- making observations and recording them in a table.  Discuss the observations.  Write down equations for the reactions. | Magnesium  Zinc  Copper | K.L.B. BK III  *PP. 165-166*  *Longhorn*  *Book III*  *PP 166-8* |  |
| 5 | Nitric acid and carbonates. | To describe action of nitric acid on carbonates and hydrogen carbonates. | Group experiments: - Action of Nitric acid on hydrogen carbonates. | Solutions of  Na2CO3  NaHCO3  ZnCO3  CuCO3 | K.L.B. BK III  *P. 167*  *Longhorn*  *Book III*  *229-30* |  |
| 11 | 1 | Reaction of dil. nitric acid with hydrogen carbonates. | Write equations for reaction of dil. nitric acid with hydrogen carbonates. | Discussion and corresponding equations. |  | K.L.B. BK III  *P. 167* |  |
| 2 | Dilute nitric acid and metal hydroxides and oxides. | Predict results of reacting dilute nitric acid with metal hydroxides and oxides. | Group experiments & writing equations for the reactions. | Metal hydroxides. | K.L.B. BK III  *P. 168*  *Longhorn*  *Book III*  *PP 238-240* |  |
|  | 3 & 4 | Reaction of nitric acid as an oxidizing agent. | Describe reactions of nitric acid as an oxidizing agent. | Class experiments: -  Explain observations made. | Nitric acid acidified iron sulphate, sulphur, and copper metal. | K.L.B. BK III  *PP. 169-170*  *Longhorn Book III*  *PP 239 -240* |  |
| 5 | Uses of nitric acid  &  nitrates. | To state uses of nitrates.  To describe preparation of nitrates. | Discussion  Equations for the reactions for preparation of nitrates. |  | K.L.B. BK III  *P. 171*  *Longhorn Book III*  *PP 240* |  |
| 12 | 1 | Action of heat on nitrates. | To describe action of heat on nitrates. | Class experiments.  Observe the results before and after heating. | Solutions of NaNO3, Zn(NO3)2, Cu(NO3)2 and Al(NO3)3. | *K.L.B. BK III*  *P. 171*  *Longhorn Book III*  *PP 126-129* |  |
| 2 | Action of heat on nitrates. | To write equations of decomposition of nitrates on heating. | Discuss above observations.  Write relevant equations. |  | K.L.B. BK III  *P 172* |  |
| 3,4 | Test for nitrates. | To carry out tests on nitrates. | Class experiments.  Make observations and deductions.  Discuss the brown ring test for nitrates. |  | K.L.B. BK III  *PP 173-174*  *Longhorn*  *Book III*  *PP 243* |  |
| 5 | Nitrogen compounds and the environment. | To explain the pollution of nitrogen compounds in the environment.  To state ways of reducing environmental pollution by nitrogen compounds. | Brief guided discussion. |  | K.L.B.BK III  *PP. 173-174*  *Longhorn*  *Book III*  *PP 244-6* |  |
|  | *END OF SECOND TERM - ASSESSMENT TEST* | | | | | |

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| *FORM THREE CHEMISTRY TERM THREE YEAR 2020* | | | | | | | |
| 1 | 1 | **SULPHUR AND ITS COMPOUNDS**  Extraction of sulphur. | To describe extraction of sulphur by Frasch process. | Illustrate and discuss extraction of sulphur. | Chart-the Frasch process. | K.L.B. BK III  *PP.180-181*  *Longhorn*  *Book III*  *PP 126-129* |  |
| 2 | Allotropes of sulphur. | To identify allotropes of sulphur.  To describe preparation of allotropes of sulphur. | Discussion and exposition of new concepts. |  | K.L.B. BK III  *PP. 182-183*  *Longhorn Book*  *PP 126-129* |  |
| 3 | Physical properties of sulphur.  Heating of sulphur. | To list physical properties of sulphur.  To describe effects of heat on sulphur. | Class experiment:  Solubility of sulphur in water, benzene, e.t.c,.  Class experiments:  Heating sulphur gently then strongly.  Discuss the observations. |  | K.L.B. BK III  *P.184*  *Longhorn I*  *Book III*  *PP 253-255* |  |
| 4 & 5 | Chemical properties of sulphur. | To investigate and describe chemical properties of sulphur. | Group experiments.  Discuss observations.  Write corresponding equations. |  | K.L.B.BK III  *PP.188-190*  *Longhorn*  *Book III*  *PP 256-8* |  |
| 2 | 1 | Uses of sulphur.  Sulphur dioxide. | State uses of sulphur.  Describe lab. preparation of sulphur dioxide. | Teacher elucidates uses of sulphur.  Teacher demonstration:-  Preparation of sulphur dioxide in a fume chamber/in the open.  Carrying out tests on the gas. |  | K.L.B.BK III  *PP 191- 192*  *Longhorn Book*  *P 258* |  |
| 2 | Physical properties of sulphur dioxide. | To list down physical properties of sulphur dioxide. | Discuss the above tests. |  | K.L.B.BK III  *PP 193*  *Longhorn*  *Book III*  *PP 262-3* |  |
| 2 | 3 | Acidic properties of SO2. | To carry out experiments to determine acidic properties of SO2. | Teacher demonstration to verify acidic properties of sulphur dioxide.  Write equations. |  | K.L.B.BK III  *P. 193*  *Longhorn*  *Book III*  *PP 262-3* |  |
| 4 & 5 | Reducing action of SO2. | To verify reducing action of SO2. | Class experiments: make observations and draw conclusions.  Write balanced corresponding equations. | Experimental worksheets. | K.L.B.BK III  *P. 195* |  |
| 3 | 1 | Bleaching properties of SO2. | To carry out experiments to determine bleaching properties of SO2. | Discuss the observations made above.  Write corresponding equations. |  | K.L.B .BK III  *P. 194*  *Longhorn*  *Book III*  *PP 263-4* |  |
| 2 | Oxidizing action of SO2. | To explain Oxidizing action of SO2. | Q/A: review redox reactions.  Teacher demonstration: - Lowering magnesium into a jar of SO2; effect of SO2 on hydrogen sulphide.  Discuss observations.  Write equations for the reactions. | Burning magnesium.  Hydrogen sulphide. | K.L.B.  BK III  *PP. 198-199*  *Longhorn*  *Book III*  *PP 266-7* |  |
| 3 | Sulphate and sulphite ions.  Uses of SO2. | To carry out tests for Sulphate and sulphite ions.  State uses of SO2. | Class experiments.  Make deductions from the observations made.  Write (ionic) equations for the reactions.  Teacher elucidates uses of SO2. | Sodium sulphate  Barium chloride  Barium nitrate. | K.L.B.  BK III *P. 200*  *Longhorn*  *Book III*  *PP 268-9* |  |
| 4 & 5 | Sulphuric acid.  Contact process of manufacture. | To identify raw materials for manufacture of sulphuric acid.  To describe the contact process. | Discussion using schematic  flow charts.  Writing equations. | Chart-schematic  Flow charts. | K.L.B. BK III  *PP.201-203*  *Longhorn*  *Book III*  *PP 275-6* |  |
| 4 | 1 | Properties of conc. H2SO4. | Investigate properties of conc. H2SO4. | Class / group expts on worksheets.  Enter results in a table. |  | K.L.B.BK III  *PP 203-204*  *Longhorn*  *Book III*  *PP 274-5* |  |
| 2 | Properties of conc. H2SO4. | Describe properties of conc. H2SO4. | Discuss above observations.  Write relevant equations. |  | K.L.B.  BK III  *P. 204* |  |
| 3 | Physical properties of sulphuric acid. | To dilute conc. sulphuric acid.  State physical properties of sulphuric acid. | Teacher demonstration – diluting conc. sulphuric acid.  Discuss use of conc. sulphuric acid as a drying and dehydrating agent. | Conc. sulphuric acid. | K.L.B.  BK III *P. 205*  *Longhorn*  *Book III*  *PP 274-5* |  |
| 4,5 | Chemical properties of Sulphuric acid. | To write equations to show that conc. sulphuric acid is a drying and dehydrating agent.  To describe reactions of dilute H2SO4 with metals. | Discussion and explanations.  Group expts. – reaction of metals with dilute H2SO4, make observations and relevant deductions; writing corresponding equations. | Magnesium, zinc, copper metals. | K.L.B.  BK III *P. 206*  *Longhorn*  *Book III*  *PP 276-8* |  |
| 5 | 1 | Dilute H2SO4, carbonates and hydrogen carbonates. | To investigate reaction of dilute H2SO4 with carbonates and hydrogen carbonates. | Class expts.  Making tabulated observations. |  | K.L.B.  BK III *P. 208*  *Longhorn*  *Book III*  *PP 279-80* |  |
| 2 | Dilute H2SO4, carbonates and hydrogen carbonates. | To describe reaction of dilute H2SO4 with carbonates and hydrogen carbonates. | Discussion, writing relevant equations. |  | K.L.B.  BK III *P. 208* |  |
| 3 | Dilute H2SO4, and metal oxides and hydroxides. | To investigate reaction of dilute H2SO4 with metal oxides and hydroxides. | Class expts.  Observing colour changes. | Oxides of magnesium, zinc, copper.  NaOH Solution. | K.L.B.  BK III *P. 210*  *Longhorn*  *Book III*  *PP 287-8* |  |
| 4,5 | Dilute H2SO4 and metal oxides & hydroxides. | To explain reactions of dilute H2SO4 with metal oxides and hydroxides. | Discussion, writing relevant chemical equations. |  | K.L.B.  BK III *P. 211* |  |
| 6 | 1,2 | Hydrogen sulphide.  Preparation of the gas.  Reaction of the gas with oxygen. | To describe preparation of hydrogen sulphide.  To state properties of the gas. | Theoretical / descriptive approach.  Writing corresponding equations.  Discuss physical properties of the gas and reaction of the gas with oxygen. |  | K.L.B.  BK III *P. 210*  *Longhorn*  *Book III*  *PP 289-90* |  |
| 3,4 | Reaction of the gas with water.  Reducing properties of the gas. | To write equations for reaction of the gas with water.  To demonstrate reducing properties of the gas. | Writing chemical equations for the reactions. |  | K.L.B.  BK III *P. 212.*  *Longhorn*  *Book III*  *PP 291-2* |  |
| 5 | Sulphur and its effects on the environment. | To explain environmental pollution caused by sulphur and its compounds. | Discussion and explanation. |  | K.L.B.  BK III *P. 214*  *Longhorn Book*  *PP 293-5* |  |
| 7 | 1 | TEST | |  |  |  |  |
| 2 | CHLORINE & ITS COMPOUNDS  Lab. preparation of chlorine gas. | Describe laboratory preparation of chlorine gas. | Teacher demonstration – gas prep. tests on the gas. | Conc. HCl, Manganese (IV) oxide. | K.L.B.BK III  *P. 219*  *Longhorn*  *Book III*  *PP 298-9* |  |
| 3 | Physical properties of chlorine. | State physical properties of chlorine. | Q/A: Relate the properties to the method of collection of the gas.  Write equations for the reaction leading to formation of chlorine. |  | K.L.B.BK III  *P. 220.*  *Longhorn*  *Book III*  *P 301* |  |
| 7 | 4 | Chemical properties of chlorine – reaction with water. | To investigate and explain reaction of chlorine with water. | Teacher demonstration:  Writing chemical equations. | Moist blue litmus papers. | K.L.B.BK III  *P. 222*  *Longhorn*  *Book III*  *PP 301-2* |  |
| 5  1 | Chemical properties of chlorine  - Reaction with metals  - Reaction with non-metals. | To investigate and explain reaction of chlorine with metals / non-metals. | Teacher demonstration:  Discussion.  Writing chemical equations. |  | K.L.B.BK III  *PP.*  *224 -225*  *Longhorn*  *Book III*  *PP 303-5* |  |
| 8 |
| 2,3 | - Oxidizing properties of chlorine. | To investigate and explain reaction of chlorine with reducing a gents. | Group experiments.  Discuss and explain observations made.  Write corresponding chemical equations. | Expt. Worksheets. | K.L.B. BK III  *PP. 226 -227*  *Longhorn Book*  *PP 307-8* |  |
| 4 | Chlorine and alkalis. | To investigate and explain reaction of chlorine with alkalis. | Teacher demonstration: Bubbling chlorine with dilute cold / hot NaOH solution.  Make observations and account for them. | Cold / hot NaOH solutions. | K.L.B.BK III  *P. 228*  *Longhorn Book III*  *PP 313-4* |  |
| 5  1 | Test for chlorides. | To carry out tests for chlorides. | Class expts.  Discuss observations, results.  Write chemical equations for the reactions. | Expt. Worksheets.  Zinc chloride, litmus paper, conc. Sulphuric acid. | K.L.B.BK III  *P. 230*  *Longhorn Book III*  *PP 318-319* |  |
| 9 |
| 2 | Uses of chlorine gas. | To state uses of chlorine. | Teacher elucidates uses of chlorine. |  | K.L.B.BK III  *P. 231*  *Longhorn Book III*  *PP 320* |  |
|  | 3,4 | Hydrogen chloride gas.  Lab. prep.  Physical properties. | To describe Lab. prep of hydrogen chloride gas.  To investigate and state physical properties of hydrogen chloride gas. | Teacher demonstration.  Carry out tests on the gas and deduce the properties of the gas. | Sodium chloride crystals, conc H2SO4 | K.L.B.BK III  *P. 232*  *Longhorn*  *Book III*  *PP 323-4* |  |
| 5 | Aqueous hydrogen chloride. | To prepare aqueous hydrogen chloride. | Class experiment leading to deduction of chemical properties of hydrogen chloride gas. | Distilled water. | K.L.B.BK III  *P. 234* |  |
| 10 | 1,2 | Further chemical properties of hydrogen chloride gas. | To determine chemical properties of hydrogen chloride gas.  To carry out confirmatory test for hydrogen chloride gas. | Class experiment leading to deduction of further chemical properties of hydrogen chloride gas / confirmatory test for hydrogen chloride gas. | Ammonia solution. | K.L.B. BK III  *PP.*  *235 -223*  *Longhorn*  *Book III*  *PP 327-331* |  |
| 3 | Large-scale production of hydrochloric acid. | Identify raw materials for manufacture of hydrochloric acid in large scale.  Describe the manufacturing process. | Discussion and giving relevant equations. |  | K.L.B.BK III  *P. 237*  *Longhorn Book III*  *P 330* |  |
| 4 | Uses of hydrochloric acid. | To state uses of hydrochloric acid. | Brief discussion. |  | K.L.B. BK III  *P. 237*  *Longhorn Book III*  *P 331-3* |  |
| 5 | Effects of hydrochloric acid on the environment. | To explain effects of hydrochloric acid on the environment. | Discussion and explanation.  Assignment. |  | K.L.B. BK III  *P 238.*  *Longhorn Book III*  *PP 334-8* |  |
|  |  | SUMMATIVE ASSESSMENT TEST | | | | |  |