



NAME OF THE DEPARTMENT : SCIENCE: SYLLABUS BREAK UP 2021-22 -AJI

Name of the Subject Teacher:-SUNDARESH KUMAR

Grade:-12

MONTH	WEEK	Unit/Section	No of Periods	Topic Break Down / for Periods/Learning objectives / progression	Learning Outcomes/ Skills acquired	Activities (Formative assessment tasks, projects, Visits) INCLUDING VIRTUAL LEARNING	Teaching Aids / Reference/ Resources	Competencies and Values	MY IDENTITY	Cross curricular link	Artificial Intelligence	Critical Tinking Questions- Descriptive	Critical Tinking Questions- Objective
April	4	Solid state	7	Describe the general Characteristics of solid state.Differentiate between crystalline state and amorphous state, classification of crysatalline solids, Crystal lattice and unit cells, Close packed structure, Calculate the Packing in HCP and BCC	Students will be able to discuss the general characteristics of solid state, Students will be able to differentiate between crystalline state and amorphous state, Students will be able to explain the classification of crystalline solids, Students will be able to describe the crystal lattice, unit cells and three types of unit cells	Students will make a three dimensional model of HCP and BCC	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Critical Thinking Creative Thinking Team Work INTEGRITY	Applications of metallic lattice in various spheres of life in the UAE	Three dimensional structure of crystal lattice (ART)	Artificial intelligence can help analyse crystal structures. Ultra microscopy technique uses machine learning to provide more information about a material's crystallographic structure so less time has to be spent analysing data.	1. If three elements A,B and C crystallises in a cubic solid lattice with A atoms at the corners, B atoms at the cube centre and C atoms at the centre of the face of the cube , then write the formula of the compound. 2. A crystalline solid has a cubic structure in which tungsten (W) atoms are located at cube centres of the unit cell, oxygen atom at the cube edge and sodium atom at the centre. What is the molecular formula of the compound. 3.In the mineral spinal; having the formula MgAl2O4. The oxide ions are arranged in CCP. Mg2+ ions occupy the tetrahedral voids. While Al3+ ions occupy the octahedral voids. (i) What percentage of tetrahedral voids is occupied by Mg2+ ions ? (ii) What percentage of octahedral voids is occupied by Al3+ ions ?	1.Which one of the following is non-crystalline or amorphous?a)Diamond (b) Graphite (c) Glass (d) Common Salt 2. NaCl typecrystal (with coordination no. 6 : 6) can be converted into CsCl type crystal (with coordination no. 8 : 8) by applying (a) high temperature (b) high pressure (c) high temperature and high pressure (d) low temperature and low pressure 3. How many chloride ions are surrounding sodium ion in sodium chloride crystal ? (a) 4 (b) 8 (c) 6 (d) 12 4. In NaCl structure (a) all octahedral and tetrahedral sites are occupied (b) only octahedral sites are occupied (c) only tetrahedral sites are occupied (d) neither octahedral nor tetrahedral sites are occupied n Zinc blende structure (a) zinc ions occupy half of the tetrahedral sites (b) each Zn2- ion is surrounded by six sulphide ions (c) each S2- ion is surrounded by six Zn2+ ions (d) it has fee structure
		Solid state	7	Discuss the Imperfections in solids, Explain the Electrical properties, conduction of electricity in metals, semiconductores, Discuss the applications of n type and p type semiconductors, Explain the various magentic properties	Students will be able to discuss the Imperfections in solids, Explain the Electrical properties, conduction of electricity in metals, semiconductores, Students will be able to discuss the applications of n type and p type semiconductors, Students will be able to explain the various magentic properties	Students will solve numericals on the topic, Students will debate on various imperfections in crystals	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Various applications of metals in industrial fields	n and p type semi conductors- (Physics)	Semiconductor Engineering is based on AI	4. Aluminiumcrystallises in a cubic close-packed structure. Radius of the atom in the metal is 125 pm. What is the length of the side of the unit cell? (ii) How many unit cells are there in 1 cm3 of aluminium?	6. Alkali halids do not show Frenkel defect because (a) cations and anions have almost equal size (b) there is a large difference in size of cations and anions (c) cations and anions have low coordination number (d) anions cannot be accommodated in voids 7. The fraction of the total volume occupied by the atoms present in a simple cube is (a) $\pi/4$ (b) $\pi/6$ (c) $\pi/3\sqrt{2}$ (d) $\pi/4\sqrt{2}$ 8. The edge length of fee cell is 508 pm. If radius of cation is 110 pm, the radius of anion is (a) 110 pm (b) 220 pm (c) 285 pm (d) 144 pm 9. How many lithium atoms are present in a unit cell with edge length 3.5 Å and density 0.53 g cm-3? (Atomic mass of Li = 6.94): (a) 2 (b) 1 (c) 4 (d) 6 10. Fe3O4 (magnetite) is an example of (a) normal spinel structure (b) inverse spinel structure (c) fluoride structure (d) anti fluoride structure
		Solution	7	Describe the term Concentration of solution. State Henrys law, Explain the applications of Henry's law, Differentiate between ideal and non ideal solutions	Students will be able to describe Concentration of solutions and various parameters,Students will able to state Henry's law and Raoult's law. Students will be able to differentiate between ideal and non ideal solutions	Prepare 1 molar solution of sodium hydroxide, Open a soda water bottle and explain that pressure is directly proportional to the solubility of CO2 gas	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of various parameteres to measure the concentration of solution in industry	Numerical Based on concentration(MATH)	1. Calculate the amount of KCl which must be added to 1 kg of water so that the freezing point is depressed by 2 K. (Kf for water = 1.86 K kg mol-1) 2. 0.6 mL of acetic acid having density 1.06 g mL-1, is dissolve in 1 litre of water. The depression in freezing point observed for this strength of acid was 0.0205°C. Calculate the Van't Hoff factor and the dissociation constant of acid.	1The atmospheric pollution is generally measured in the units of (a) mass percentage (b) volume percentage (c) volume fraction (d) ppm 2. A 5% solution of cane-sugar (molecular weight = 342) is isotonic with 1% solution of substance A. The molecular weight of X is (a) 342 (b) 171.2 (c) 68.4 (d) 136.8 3. H2S is a toxic gas used in qualitative analysis. If solubility of H2S in water at STP is 0.195 m. what is the value of KH? (a) 0.0263 bar (b) 69.16 bar (c) 192 bar (d) 282 bar 4. Henry's law constant for molality of methane is benzene at 298 K is 4.27 x 105 mm Hg. The mole fraction of methane is nenzene at 298 K under 760 mm Hg is (a) 1.78 x 10-3 (b) 17.43 (c) 0.114 (d) 2.814 5. The law which indicates the relation-hip between solubility of a gas in liquid and pressure rs (a) Raoult's law (b) Henry's law (c) Lowering of vapour pressure (d) Van't Hoff law 6. Vapour pressure of a pure liquid X is 2 atm at 300 K. It is lowered to 1 atm on dissolving 1 g of Y in 20 g of liquid X. If molar mass of X is 200, what is the molar mass of Y? (a) 20 (b) 50 (c) 100 (d) 200	
Solution	7	Discuss the various Colligative properties such as relative lowering of vapour pressure, elevation of boiling point, depression of freezing poni, osmotic pressure. Explain the term Abnormal molar mass and Vant Hoff factor	Students will be able to discuss colligative properties and correlate these with molar mass of the solute Students will eb able to categorise abnormal colligative properties exhibited by some solutes in solutions Students will be able to discuss Vant Hoff factor and the reason for introducing it while measuring molar mass	Students will debate about the variation of molar mass caused due to association and dissociation,List out ionic solids which undergo dissociation when dissolved in water	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Reverse osmosis principle employed in the desalination plant across UAE	Revesre osmosis(Desalination of Sea water) Osmosis (Biology)	3 D view of Desalination plant	3. Out of two 0.1 molal solutions of glucose and of potassium chloride, which one will have a higherboiling point and why? 4.. Two elements A and B from compounds having formula AB2and AB4. When dissolved in 20 g of benzene, 1 g of AB2 lowers the freezing point by 2.3 K where as 1.0 g of AB4 lowers it by 1.3 K. The molar depression constant for benzene is 5.1 K kg mol-1. Calculate atomic mass of A and B.	7. 3 moles of P and 2 moles of Q are mixed, what will be their total vapour pressure in the solution if their partial vapour pressures are 80 and 60 torr respectively? (a) 80 torr (b) 140 torr (c) 72 torr (d) 70 torr 8. A plant cell shrinks when it is kept in a (a) hypotonic solution (b) hypertonic solution (c) isotonic solution (d) pure water 9. What weight of glycerol should be added to 600 g of water in order to lower its freezing point by 10°C ? (a) 496 g (b) 297 g (c) 310 g (d) 426 g 10. The osmotic pressure of a solution can be increased by (a) increasing the volume (b) increasing the number of solute molecules (c) decreasing the temperature (d) removing semipermeable membrane		

4	Electrochemistry	7	Explain the Differences between electrochemical cell and electrolytic cell Depict the representation of electrochemical cell	Students will be able to Understand the difference between galvanic cell and electrolytic cell. Students will be able to depict the electrochemical cell symbolically. Students will be able to Write the electrode reactions	• Students will make a working model of electrochemical cell	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE		Applications of Electrochemical cell in UAE;;	Electrochemical cell (Physics)	Electrochemical Determination of Potassium Ferricyanide can be done using Artificial Intelligence	1. The electrical resistance of a column of 0.05 M NaOH solution of diameter 1 cm and length 50 cm is $5.55 \times 10^3 \text{ ohm}$. Calculate its resistivity, conductivity and molar conductivity 2. Three electrolytic cells A, B and C containing solutions of zinc sulphate, silver nitrate and copper sulphate, respectively are connected in series. A steady current of 1.5 ampere was passed through them until 1.45 g of silver were deposited at the cathode of cell B. How long did the current flow? What mass of copper and what mass of zinc were deposited in the concerned cells? (Atomic masses of Ag = 108, Zn = 65.4, Cu = 63.5)	1. The charge required for the reduction of 1 mol of MnO_4^- to MnO_2 is (a) 1 F (b) 3 F (c) 5 F (d) 6 F 2. If limiting molar conductivity of Ca^{2+} and Cl^- are 119.0 and 76.3 $\text{S cm}^2 \text{ mol}^{-1}$, then the value of limiting molar conductivity of CaCl_2 will be (a) 195.3 $\text{S cm}^2 \text{ mol}^{-1}$ (b) 271.6 $\text{S cm}^2 \text{ mol}^{-1}$ (c) 43.3 $\text{S cm}^2 \text{ mol}^{-1}$ (d) 314.3 $\text{S cm}^2 \text{ mol}^{-1}$ 3. The reaction, $3\text{ClO}^- (\text{aq}) \rightarrow \text{ClO}_3^- (\text{aq}) + 2\text{Cl}^- (\text{aq})$ is an example of (a) Oxidation reaction (b) Reduction reaction (c) Disproportionation reaction (d) Decomposition reaction 4. The standard emf of a galvanic cell involving cell reaction with $n = 2$ is found to be 0.295 V at 25° C. The equilibrium constant of the reaction would be (a) 1.0×10^{10} (b) 2.0×10^{11} (c) 4.0×10^{12} (d) 1.0×10^2 [Given $F = 96500 \text{ (mol}^{-1}\text{)}$; $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$] 5. Molar conductivity of 0.15 M solution of KCl at 298 K, if its conductivity of 0.0152 S cm^{-1} will be (a) 124 $\Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$ (b) 204 $\Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$ (c) 101 $\Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$ (d) 300 $\Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$
	Electrochemistry	7	Explain the variation of molar conductivity with concentration. Derive the Nernst equation and solve numerical based on it. Differentiate between primary cell and secondary cell, Describe the chemistry of corrosion and prevention of corrosion	Students will be able to Justify the variation of conductivity and molar conductivity of solutions with change in their concentration. Students will be able to write Nernst equation for various electrochemical cell and solve numerical based on it. Students will be able to understand quantitative aspects of electrolysis. Students will be able to write electrode reactions. Write the cell reactions in various cells	Students will apply Nernst equation to calculate the cell potential of various combination of electrochemical cell. Students will debate on the variation of molar conductivity with concentration for strong and weak electrolyte	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Applications of Fuel cell in UAE;;	Various secondary and primary cells (PHYSICS)	3 D view of Nickel Cadmium cell	3. Conductivity of 0.00241 M acetic acid is $7.896 \times 10^{-5} \text{ S cm}^{-1}$. Calculate its molar conductivity and if for acetic acid 390.5 $\text{S cm}^2 \text{ mol}^{-1}$, what is its dissociation constant? 4. Which solution will allow greater conductance of electricity, 1 M NaCl at 293 K or 1 M NaCl at 323 K and why? 5. Rusting of iron is quicker in saline water than in ordinary water. Why is it so? 6. Which of the following pairs will have greater conduction and why? (a) Copper wire at 25 °C and Copper wire at 50 °C. (b) 0.1 M acetic acid solution or 1 M acetic acid solution?	6. Faraday's law of electrolysis is related to (a) Atomic number of cation (b) Speed of cation (c) Speed of anion (d) Equivalent weight of electrolyte 7. How long would it take to deposit 50 g of Al from an electrolytic cell containing Al_2O_3 using a current of 105 ampere? (a) 1.54 h (b) 1.42 h (c) 1.32 h (d) 2.15 h 8. How much electricity in terms of Faraday is required to produce 100 g of Ca from molten CaCl_2 ? (a) 1F (b) 2F (c) 3F (d) 5F 9. If a current of 1.5 ampere flows through a metallic wire for 3 hours, then how many electrons would flow through the wire? (a) 2.25×10^{22} electrons (b) 1.13×10^{23} electrons (c) 1.01×10^{23} electrons (d) 4.5×10^{23} electrons 10. How much time is required to deposit $1 \times 10^{-3} \text{ cm}^3$ thick layer of silver (density of 1.05 g cm^{-3}) on a surface of area 100 cm^2 by passing a current of 5 A through AgNO_3 solution? (a) 125 s (b) 115 s (c) 18.7 s (d) 27.25 s	
	Chemical Kinetics	7	Discuss the Rate of chemical reaction Differentiate between Average rate and instantaneous rate. Derive the Integrated rate equation for First order and zero order reaction. Derive Arrhenius equation	Students will be able to understand average and instantaneous rate and the dependence of rate of reactions on concentration, temperature. Students will be able to differentiate between the molecularity and order of a reaction Students will be able to Derive integrated rate equations for the zero and first order reaction. Students will be able to describe collision theory	1) Students will discuss about average rate and instantaneous rate by incorporating into real life situation. 2) Students will derive integrated rate equation for zero order and first order reaction	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Dependence of temperature for the rate of various reactions in UAE	Catalyst used to accelerate the reaction can be linked with Bio chemical catalyst- Enzymes used in Biological process	AI can be used to study rate of organic reactions	1. A reaction is of first order in A and of second order in B. Write the differential rate equation for this reaction. How will its initial rate be affected if the concentration of both A and B are together doubled? 2. A reaction is of second order with respect to a reactant. How will the rate of reaction be affected if the concentration of this reactant is (i) doubled (ii) reduced to half? 3. A first order reaction has a rate constant of 0.0051 min^{-1} . If we begin with 0.10M concentration of the reactant, what concentration of reactant will remain in solution after 3 hours? 4. A first order reaction takes 40 minutes for 30% decomposition. Calculate $t_{1/2}$ for this reaction	1. Which of the following statements about the catalyst is true? (a) A catalyst accelerates the rate of reaction by bringing down the activation energy. (b) A catalyst does not participate in reaction mechanism. (c) A catalyst makes the reaction feasible by making ΔG more negative. (d) A catalyst makes equilibrium constant more favourable for forward reaction. 2. For a chemical reaction $\text{A} \rightarrow \text{B}$, it is found that the rate of reaction doubles when the concentration of A is increased four times. The order of reaction is (a) Two (b) One (c) Half (d) Zero 3. The half life of the first order reaction having rate constant $K = 1.7 \times 10^{-5} \text{ s}^{-1}$ is (a) 12.1 h (b) 9.7 h (c) 11.3 h (d) 1.8 h 4. In chemical equation $\text{H}_2 (\text{g}) + \text{I}_2 (\text{g}) \rightleftharpoons 2\text{HI} (\text{g})$ the equilibrium constant K_p depends on (a) total pressure (b) catalyst used (c) amount of H_2 and I_2 (d) temperature 5. If the rate of a reaction is expressed by, $\text{rate} = A [\text{A}]^x [\text{B}]^y$, the order of reaction will be (a) 2 (b) 3 (c) 1 (d) 0	
	Halo Alkanes and Haloarenes	7	Describe the Preparation of haloalkane by various methods Differentiate between SN_2 and SN_1 mechanism Chemical reaction in haloalkane and halo arenes Polyhalogen compounds	Students will be able to understand the nomenclature, preparation and properties of haloalkanes and haloarenes. Students will be able to explain the mechanism of SN_1 and SN_2 reactions Students will be able to correlate the structures of haloalkanes and haloarenes with various types of reactions. Students will be able to appreciate the applications of organo-metallic compounds Students will be able to highlight the environmental effects of polyhalogen compounds	1) Students will discuss the various methods of preparation of halo alkanes and halo arenes. 2. Students will be able to write the mechanism of SN_1 and SN_2 reaction	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	List the various organic compounds in everyday life in UAE	Environmental effects of poly halogen compounds- Geography and Biology	Studies of SN_1 and SN_2 reactions with modelling	1. An Organic compound 'A' having molecular formula C_4H_8 on treatment with dil H_2SO_4 gives 'B'. 'B' on treatment with HCl and anhydrous ZnCl_2 gives 'C' and on treatment with sodium ethoxide gives back 'A'. Identify the compound 'A', 'B' and 'C' and write equation involved. 2. Predict the order of reactivity of the following compound in SN_1 and SN_2 reaction. (a) The four isomeric bromobutane (b) $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$, $\text{C}_6\text{H}_5\text{CH}(\text{C}_6\text{H}_5)\text{Br}$, $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{Br}$, $\text{C}_6\text{H}_5\text{C}(\text{CH}_3)\text{C}_6\text{H}_5\text{Br}$	1. SN_1 reaction of alkyl halides lead to (a) Retention of configuration (b) Racemisation (c) Inversion of configuration (d) None of these 2. Chloropicrin is formed by the reaction of (a) steam on carbon tetrachloride. (b) nitric acid on chlorobenzene. (c) chlorine on picric acid. (d) nitric acid on chloroform. 3. Fitting reaction can be used to prepare (a) Toluene (b) Acetophenone (c) Diphenyl (d) Chlorobenzene 4. Which of the following undergoes nucleophilic substitution exclusively by SN_1 mechanism? a) Benzyl chloride b) Ethyl chloride c) Chlorobenzene d) Isopropyl chloride 5. C-Cl bond of chlorobenzene in comparison to C-Cl bond in methyl chloride is a) Longer and weaker b) Shorter and weaker c) Shorter and stronger d) Longer and stronger	
Alcohols Phenols and Ethers	7	Describe the Preparation and properties of alcohols and phenols. Discuss the Preparation of ethers by various methods	Students will be able to explain the nomenclature of aromatic as well as aliphatic alcohols. Students will be able to discuss the preparation and chemical reactions of alcohols, phenols and ethers. Students will be able to compare the physical properties of alcohols phenols and ethers with their structures Students will be able to analyse the difference between primary, secondary and tertiary alcohols Students will be able to discuss the chemical reactions of the three classes of compounds on the basis of their functional groups	1) Students will debate on the various methods of preparation of alcohols and phenols. 2) By conducting experiments in the laboratory, students will distinguish primary secondary and tertiary alcohols	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Applications of alcohols in industry in UAE	Alcohols - Ethanol used in Medicine, Isopropanol is used as Hand Sanitiser in medical fields	3 D view of primary, 2o and 3o alcohols	1. Di-tert butyl ether cannot be made by Williamson's synthesis. Explain why 2. Convert the following :- (i) Ethyl alcohol and Acetic acid (ii) Propan - 2 - ol to propan 3. Arrange the following compounds in the increasing order of their acidic strength Propan - 1 - ol ; 2,4,6 trinitrophenol; 3 - nitrophenol; 3,5 dinitro-phenol; Phenol; 4-methyl phenol 4. (i) Of benzene and phenol, which is more easily nitrated and why?	1. Which of the following alcohols gives 2-butene on dehydration by conc. H_2SO_4 ? (a) 2-methyl propene-2-ol (b) 2-methyl 1 - propanol (c) Butane-2-ol (d) Butane 1-ol 2. One mole of ethyl acetate on treatment with an excess of LiAlH_4 in dry ether and subsequent acidification produces (a) 1 mole acetic acid + 1 mole ethyl alcohol (b) 1 mole ethyl alcohol + 1 mole methyl alcohol (c) 2 moles of ethyl alcohol (d) 1 mole of 2-butanol 3. 1-Phenylethanol can be prepared by the reaction of benzaldehyde with (a) methyl bromide (b) ethyl iodide and magnesium (c) methyl iodide and magnesium (Grignard reagent's) (d) methyl bromide and aluminium bromide 4. Which of the following alcohols will give the most stable carbocation during dehydration? (a) 2-methyl-1-propanol (b) 2-methyl-2-propanol (c) 1-Butanol (d) 2-Butanol 5. What happens when tertiary butyl alcohol is passed over heated copper at 300°C? (a) Secondary butyl alcohol is formed (b) 2-methylpropene is formed (c) 1-butene is formed (d) Butanol is formed		

June	Aldehydes ketone and carboxylic Acid	7	Explain the Nomenclature of aldehydes, ketones and carboxylic acids. Describe the various methods of Preparation and properties of aldehydes	Students will be able to name the aldehyde and ketone by IUPAC system of nomenclature. Students will be able to correlate physical properties and chemical reactions of aldehydes. Students will be able to analyze the various methods for the preparation of aldehyde	Students will name the given organic compounds on the basis of IUPAC system of nomenclature	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc. phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of aldehyde in UAE	Propanone is used in cosmetology	3 D view of first three members of Aldehyde family	1. Would you expect benzaldehyde to be more reactive or less reactive in nucleophilic addition reaction than propanal? Explain 2. Distinguish between : (i) Acetaldehyde and acetone (ii) Methanoic acid and Ethanoic acid 3. Why HCOOH does not give HVZ (Hell Volhard Zelinsky) reaction but CH ₃ COOH does? 4. During preparation of esters from a carboxylic acid and an alcohol in the presence of an acid catalyst, water or the ester formed should be removed as soon as it is formed	1. Which of the following reactions will give benzophenone? (i) Benzoyl chloride + Benzene + AlCl ₃ (ii) Benzoyl chloride + Phenylmagnesium bromide (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (i), (ii) and (iii) 2. Which of the following reactions will give benzophenone? (i) Benzoyl chloride + Benzene + AlCl ₃ (ii) Benzoyl chloride + Phenylmagnesium bromide (iii) Benzoyl chloride + Diphenyl cadmium (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (i), (ii) and (iii) 3. Propanone can be prepared from ethyne by (a) passing a mixture of ethyne and steam over a catalyst, magnesium at 420°C (b) passing a mixture of ethyne and ethanol over a catalyst zinc chromite (c) boiling ethyne with water in the presence of HgSO ₄ and H ₂ SO ₄ (d) treating ethyne with iodine and NaOH
	Aldehydes ketone and carboxylic Acid	7	Explain the Preparation of ketone and carboxylic acids. Discuss the Electrophilic substitution reaction. Discuss the Acidic character of carboxylic acids. HVZ reaction, Decarboxylation reaction	Students will be able to analyse the various factors affecting the acidity of carboxylic acids and their reactions. Students will be able to explain the mechanism of selected reactions aldehydes and ketone. Students will be able to describe the uses of aldehydes, ketones and carboxylic acid	1) Students will write the mechanism of nucleophilic addition to the carbonyl compound followed by hydrolysis. 2) List the important uses of aldehydes and ketone containing organic compound	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc. phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of aldehyde in UAE	Various carboxylic are organic acids- Link with	Acidity of carboxylic acid - 3 D view	5. Arrange the following compounds in increasing order of their acid strength. Benzoic acid, 4-Nitrobenzoic acid, 3, 4-dinitrobenzoic acid, 4-methoxy benzoic acid. 6. Why are aldehydes more reactive than ketones? 7. An organic compound with the molecular formula C ₉ H ₁₀ O forms 2, 4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction. On vigorous oxidation, it gives 1, 2-benzenedicarboxylic acid. Identify the compound.	4. The oxidation of toluene to benzaldehyde by chromyl chloride is called (a) Etard reaction (b) Riemer-Tiemann reaction (c) Wurtz reaction (d) Cannizzaro's reaction 5. The addition of HCN to carbonyl compounds is an example of (a) nucleophilic addition (b) electrophilic addition (c) free radical addition (d) electromeric addition
	Amines	7	Explain the methods of Preparation of amines. Discuss the properties of amines and chemical reactions of amine basic character of amines Distinction between primary, secondary and tertiary amines. Benzene diazonium salts and the preparation of various organic compounds from it. Coupling reaction	Students will be able to Identify amines by common and IUPAC name, preparation and properties of amines. Students will be able to explain the methods of preparation of amines by various methods. Students will be able to analyze the basic character of methyl and ethyl substituted amines in aqueous medium. Students will be able to distinguish between primary, secondary and tertiary amines by Hinsberg test. Explain Diazotisation reaction. Students will be able to write the chemical equations for the preparation of various organic compounds from benzene diazonium chloride. Students will be able to analyze coupling reaction with example	Students will name the various amines on the basis of IUPAC system of nomenclature. Arrange the amines in the increasing order of basic strength. By conducting experiments in the laboratory students will distinguish primary secondary and tertiary amines. Students will make a list of the important organic compounds prepared from benzene diazonium chloride	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc. phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of different amines in UAE	Use of amines as fragrances (Medicine and cosmetology)		1. How can you distinguish between 1° and 2° amine? 2. An organic compound A with molecular formula C ₂ H ₅ NO ₂ reacts with nitrous acid to give C ₂ H ₄ O ₃ N. B. On reduction A gives another compound C with molecular formula C ₂ H ₇ N. On treatment with nitrous acid gives D which shows iodoform test. Identify A. 3. An aliphatic compound X, molecular formula C ₃ H ₇ NO, reacts with bromine in presence of KOH to produce another compound Y. The compound Y further reacts with nitrous acid to form Ethanol & nitrogen gas. Identify X & Y and write chemical reactions involved	1. Nitrogen atom of amino group is hybridised. (a) sp (b) sp ² (c) sp ³ (d) sp ^{3d} C ₃ H ₈ N cannot represent (a) 1° amine (b) 2° amine (c) 3° amine (d) quaternary ammonium salt 2. The most convenient method to prepare primary (i) Amine) amine containing one carbon atom less is (a) Gabriel phthalimide synthesis (b) Reductive amination of aldehydes (c) Hofmann bromamide reaction (d) Reduction of isonitriles 4. When excess of ethyl iodide is treated with ammonia, the product is (a) ethylamine (b) diethylamine (c) triethylamine (d) tetraethylammonium iodide 5. Amides may be converted into amines by a reaction named after (a) Hofmann Bromide (b) Claisen (c) Perkin (d) Kekule
July August	SUMMER VACATION											
September	General principles and process of isolation of elements	7	Differentiate ores and minerals. Describe the various methods of concentration of ores. Describe Ellingham diagram. Describe the steps involved in the Extraction of Iron, copper and Al. Describe the various methods of refining	Students will be able to explain the terms minerals, ores, concentration, roasting, calcination etc. Students will be able to explain the extraction process of Al, Cu, Zn & Fe. Students will be able to analyze the purification of metals by various methods	Students will list out the ores of elements such as Al, Cu, Zn, Fe etc. Students will debate on the extraction of copper and zinc. Students will be asked to write the various refining processes for metals	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc. phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	List out the metals present in the UAE in the earth's crust	Various ores - Link with Geography	3D View of Blast furnace	1. Copper matte is charged into a silica lined converter in the extraction of copper. What is the role of silica lining here? 2. What is the role of a depressant in Froth floatation process for the concentration of a sulphide ore? 3. Describe how the following changes are brought about: (i) Pig iron into steel. (ii) Zinc oxide into metallic zinc. (iii) Impure titanium into pure titanium	1. Malachite is an ore of (a) iron (b) copper (c) zinc (d) Silver 2. For which of the following ores froth floatation method is used for concentration? (a) Haematite (b) Zinc blende (c) Magnetite (d) Cassiterite 3. Which of the following ores is concentrated by chemical leaching method? (a) Cinnabar (b) Argentite (c) Copper pyrites (d) Galena 4. The significance of leaching in the extraction of aluminium is (a) it helps removing the impurities like SiO ₂ , Fe ₂ O ₃ etc. from the bauxite ore (b) it converts the ore into oxide (c) it reduces melting point of the ore (d) it eliminates water from bauxite 5. Which of the following oxides cannot be reduced by hydrogen? (a) Ferric oxide (b) Aluminium oxide (c) Zinc oxide (d) Cupric oxide
	P Block Elements	7	Describe the Chemistry of group 15 elements. Explain the preparation of ammonia. Depict the structures of oxoacids of phosphorus. Describe the Chemistry of group 16 elements. Explain the Preparation of O ₂ , O ₃ , properties and reactions. Depict the structures of Oxoacids of sulphur.	Students will be able to describe the preparation, properties and uses of ozone and chemistry of some simple oxides. Students will be able to write the properties of allotropic forms of sulphur. Students will be able to depict the structures of oxoacids of P and S	Students will debate on group 16 elements highlighting their importance, properties and uses	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc. phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Uses of Group 16 elements in the UAE	Importance of P in industry. Sulphuric acid - Link with Physics	3 D view of Oxoacids of P and Sulphur	01. Give reason for the following H ₃ PO ₃ and H ₃ PO ₂ show reducing character. 02. Catenation in oxygen is lesser than sulphur. 03. Group 16 members are called chalcogens. 04. P _{Ka} value of HOCl is higher than that of HOCIO. 05. Nitrogen shows Maximum covalency of four. 06. NH ₃ has higher dipole moment than NF ₃ . 2. Predict the shape and the asked angle (90° or more or less) in each of the following cases: (i) SO ₃ ²⁻ and the angle O—S—O (ii) ClF ₃ and the angle F—Cl—F (iii) XeF ₂ and the angle F—Xe—F	1. The boiling points of hydrides of group 16 are in the order (a) H ₂ O > H ₂ Te > H ₂ S > H ₂ Se (b) H ₂ O > H ₂ S > H ₂ Se > H ₂ Te (c) H ₂ O > H ₂ Te > H ₂ Se > H ₂ S (d) None of these 2. Fluorine differs from rest of the halogens in some of its properties. This is due to (a) its smaller size and high electronegativity. (b) lack of d-orbitals. (c) low bond dissociation energy. (d) All of these 3. The set with correct order of acidity is (a) HClO < HClO ₂ < HClO ₃ < HClO ₄ (b) HClO ₄ < HClO ₃ < HClO ₂ < HClO (c) HClO < HClO ₄ < HClO ₃ < HClO ₂ (d) HClO ₄ < HClO ₂ < HClO ₃ < HClO
REVISION AND TERM- 1 EXAMINATION												

TERM- 1 EXAMINATION												
October	P Block Elements	7	Explain the Preparation and properties of Cl ₂ and HCl. Discuss the Interhalogen compounds Depict the Structures of oxoacids of Chlorine Describe the chemistry of Group 18 elements Explain the methods of Preparation of XeF ₂ ,XeF ₆ Depict the structures of compounds of Xenon	Students will be able to describe the preparation, properties and uses of ozone and chemistry of some simple oxides. Students will be able to write the methods of preparation of various compounds of Xenon. Students will be able to depict the structures of compounds of Xenon	Students will discuss the importance of chlorine as a bleaching agent	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Uses of Nobles gases in the UAE	Nobles gases - Link with Physics	Model of Compounds of Xenon	3. How would you account for the following: (i) H ₂ S is more acidic than H ₂ O. (ii) The N—O bond in NO ₂ - is shorter than the N—O bond in NO ₃ - (iii) Both O ₂ and F ₂ stabilise high oxidation states but the ability of oxygen to stabilise the higher oxidation state exceeds that of fluorine. How would you account for the following: (i) The following order of increase in strength of acids: PH ₃ < H ₂ S < HCl (ii) The oxidising power of oxoacids of chlorine follows the order: HClO ₄ < HClO ₃ < HClO ₂ <HClO	4. The formation of O ₂ + [PtF ₆]- is the basis for the formation of first xenon compound. This is because (a) O ₂ and Xe have different sizes. (b) both O ₂ and Xe are gases. (c) O ₂ and Xe have comparable electro-negativities. (d) O ₂ and Xe have comparable ionisation enthalpies. 5. Partial hydrolysis of XeF ₄ gives (a) XeO ₃ (b) XeOF ₂ (c) XeOF ₄ (d) XeF ₂ 6. The increasing order of reducing power of the halogen acids is (a) HF < HCl < HBr < HI (b) HI < HBr < HCl < HF (c) HBr < HCl < HF < HI (d) HCl < HBr < HF < HI 7. When chlorine reacts with cold and dilute solution of sodium hydroxide, it forms (a) Cl- and ClO- (b) Cl- and ClO ₂ - (c) Cl- and ClO ₃ - (d) Cl- and ClO ₄ -
	d Block Elements	7	Discuss the Important properties of d block elements Describe the Preparation of potassium dichromate and reactions Explain the methods of Preparation of potassium permanganate and chemical reactions Describe the chemistry of Inner transition elements- Lanthanides and	Students will be able to understand the general characteristics of d block and f block elements and the horizontal and group trends in them Students will be able to appreciate the relative stability of various oxidation state in terms of electrode potential values Students will be able to explain the preparation properties, structures and uses of some important compounds such as potassium dichromate and potassium permanganate	Students will write the oxidation states of elements of first series of transition elements. Students will debate on the properties of d block elements. Depict permanganate and manganate ion	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of Transition metals in UAE	Potassium permanganate as disinfectant- Medicine	3D view of Structures of Manganate and permanganate ion	1. Co(ii) is stable in aqueous soln. but in presence of strong ligands and in air get Oxidised to CO ³⁺ . Why? 2. Compare the chemistry of actinoids with that of lanthanoids with reference to (i) electronic configuration (ii) Oxidation state (iii) Chemical reactivity 3. Why Mn ²⁺ is more stable than Mn ³⁺ but Fe ³⁺ is more stable than Fe ²⁺ ? Why is Cu ⁺ diamagnetic and Cu ²⁺ paramagnetic?	1. Oxidation number of gold metal is (a) +1 (b) 0 (c) -1 (d) all of these 2. Shape of d-orbital is (a) spherical (b) dumb bell (c) double dumb bell (d) none of these 3. Lanthanoid contraction is due to increase in (a) atomic number (b) effective nuclear charge (c) atomic radius (d) valence electrons 4. Which one of the following is diamagnetic ion? (a) Co ²⁺ (b) Ni ²⁺ (c) Cu ²⁺ (d) Zn ²⁺
	Coordination compounds	7	Differentiate between double salt and coordination compounds. Describe the Nomenclature in coordination compounds, Analyze the hybridisation in coordination compounds Discuss the Bonding in co-ordination compounds. Describe the Crystal field splitting Discuss the applications of coordination compounds	Students will be able to appreciate the postulates of Werner's theory of co-ordination compounds. Students will be able to learn the rules of nomenclature of co-ordination compounds. Students will be able to discuss about different types of isomerism in co-ordination compounds. Students will be able to understand the nature of bonding in co-ordination compounds in terms of valence bond and crystal field theories. Students will be able to analyze the various applications of coordination compounds	List out the postulates of Werner's theory. Students will write the IUPAC name of the coordination compounds from the question given. Depict the structures of various isomers and make a model of geometrical isomers	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of Coordination compounds in UAE	Cisplatin - used in cancer treatment (Medicine) Chlorophyll used in photosynthesis (Biology)	3D View of Crystal field splitting	1. For the complex [Fe(en) ₂ Cl ₂], (en = ethylene diamine), identify 3 (i) the oxidation number of iron. (ii) the hybrid orbitals and the shape of the complex. (iii) the magnetic behaviour of the complex. (iv) the number of geometrical isomers. (v) whether there is an optical isomer also, and (vi) name of the complex. (At. no. of Fe = 26) 2. Fe (H ₂ O) ₆ ³⁺ is strongly paramagnetic whereas Fe(CN) ₆ ³⁻ is weakly paramagnetic. Explain. 3. Write the name, stereochemistry and magnetic behaviour of the following: (At. nos. Mn = 25, Co = 27, Ni = 28) (i) K ₄ [Mn(CN) ₆] (ii) [Co(NH ₃) ₅ Cl]Cl ₂ (iii) K ₂ [Ni(CN) ₄]	1. Primary and secondary valency of Pt in [Pt(en) ₂ Cl ₂] are (a) 4, 4 (b) 4, 6 (c) 6, 4 (d) 2, 6 2. Which of the following has square planar structure? (a) [NiCl ₄] ²⁻ (b) [Ni(CO) ₄] (c) [Ni(CN) ₄] ²⁻ (d) None of these 3. Which of the following has magnesium? (a) Chlorophyll (b) Haemocyanin (c) Carbonic anhydrase (d) Vitamin B ₁₂ 4. Which of the following shall form an octahedral complex? (a) d ₄ (low spin) (b) d ₈ (high spin) (c) d ₆ (low spin) (d) All of these 5. EDTA is used for the estimation of (a) Na ⁺ and K ⁺ ions (b) Cl ⁻ and Br ⁻ ions (c) Cu ²⁺ and Cs ⁺ ions (d) Ca ²⁺ and Mg ²⁺ ions 5. The solution of the complex [Cu(NH ₃) ₄]SO ₄ in water will (a) give the tests of Cu ²⁺ ion (b) give the tests of NH ₃ (c) give the tests of SO ₄ ²⁻ ions (d) not give the tests of any of the above
	Surface Chemistry	7	Describe the adsorption Types of adsorption. Adsorption isotherms Discuss the applications of adsorption. Differentiate between Homogeneous and heterogeneous catalysis. Differentiate between Activity and selectivity of catalyst. Explain the Shape selective catalysis. Explain the term colloids and types of colloids. Describe the Preparation of colloids Analyze the Purification of colloids. Properties of colloidal solutions Applications of colloids	Students will be able to define Adsorption and types of adsorption Students will be able to discuss Homogeneous and heterogeneous catalysis Compare the Activity and selectivity of catalyst Describe Preparation of colloids Explain the Purification of colloids and Properties of colloidal solutions	Students will be asked to study the difference between adsorption and absorption by silica gel and anhydrous CaCl ₂ . List the types of colloidal solution with examples	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	List out the various adsorption technique used in UAE	Tyndall effects and Brownian movement (PHYSICS)	Tyndall effect and Brownian movement - A 3 D view	1. Write the mechanism of Homogeneous catalysis reaction 2. Explain how the phenomenon of adsorption finds application in each of the following processes: (i) Production of vacuum (ii) Heterogeneous catalysis (iii) Froth floatation process 3. In reference to Freundlich adsorption isotherm write the expression for adsorption of gases on solids in the form of an equation 4. Discuss the effect of pressure and temperature on the adsorption of gases on solids. Describe the application in controlling humidity	1. In Freundlich adsorption isotherm x/m = Kp ^{1/n} , the value of 'n' at low pressure is (a) more than one. (b) less than one. (c) equal to one. (d) from zero to one. 2. Which shape selective catalyst is used to convert alcohol to gasoline? (a) Zeigler-Natta catalyst (b) Calgon (c) ZSM-5 (d) Zeigler-Natta catalyst 3. When a small amount of FeCl ₃ is added to a freshly precipitated Fe(OH) ₃ , a reddish brown colloidal solution is obtained. This phenomenon is known as (a) dialysis (b) peptization (c) protection (d) dissolution 4. Lyophilic colloids are stable due to (a) charge on the particles. (b) large size of the particles. (c) small size of the particles. (d) layer of dispersion of medium on the particles. 5. Cottrell precipitator is used to (a) precipitate mud from muddy water. (b) precipitate carbon particles from smoke. (c) purify the ordinary drinking water. (d) precipitate salts in qualitative analysis.
Biomolecules	7	Explain the Classification of carbohydrates Describe the Structure of glucose and fructose Explain the reactions of glucose Discuss the Amino acids and classification Protein and types of protein Describe the Denaturation of protein Explain the difference in structure of DNA and RNA Heredity	Students will be able to Understand and appreciate the role of biomolecules in biological system Students will be able to Analyse the structural difference between glucose and fructose Students will be able to differentiate between essential and non essential amino acids Students will be able to deduce the structures of proteins	Students will debate on polysaccharides, monosaccharides and oligosaccharides. Draw the structures of anomers of glucose. Make a double helical structure of DNA molecule	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc.phet simulations	Cultural Awareness & Citizenship Independent Learning TOLERANCE	Importance of Biomolecules in UAE life situation		3D View of Double helical structure of DNA	1. What do you mean by DNA finger-printing? Enlist their uses. 2. How do you explain the amphoteric nature of amino acids? 3. Give biological application of DNA. 4. Two strands of DNA are not identical but complementary. Explain. 5. Supply of vit. C needs to continue for human body. Why? 6. Amino acids are amphoteric in nature/behavior. Explain 7. The two strands of DNA are not identical but complementary to each other. Explain	1. During acetylation of glucose it needs x moles of acetic anhydride. The value of x would be (a) 3 (b) 5 (c) 4 (d) 1 2. On oxidation with a mild oxidising agent like Br ₂ /H ₂ O, the glucose is oxidized to (a) saccharic acid (b) gluconic acid (c) gluconic acid (d) valeric acid 3. Invert sugar is (a) a type of cane sugar (b) optically inactive form of sugar (c) mixture of glucose and galactose (d) mixture of glucose and fructose in equimolar quantities 4. Which of the following compounds is found abundantly in nature? (a) Fructose (b) Starch (c) Glucose (d) Cellulose 5. Which of the following is an example of an aldopentose? (a) D-Ribose (b) Glyceraldehyde (c) Fructose (d) Erythrose	

February	REVISION																	

March																		
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EXAM SCHEDULE

UT: 1 18TH MAY-27TH MAY			
PA: 1 15TH JUNE- 24TH JUNE			
HY 14th Sept - 26th Sept			
UT:2 31st Oct - 9th Nov			
Pre Board : 1 5th Dec - 14th Dec			
Pre Board : 2- 23 rd Jan -8th Feb			