UNIT I: SOLUTION
Q1. Define the following terms:
   i. Raoult’s law in its general form
   ii. Azeotropes
   iii. Reverse osmosis
   iv. Cryoscopic constant
   v. Osmosis and osmotic pressure
   vi. Ebullioscopic constant
Q2. Account for the followings:
   i. A solution containing non volatile solute have higher boiling point than the pure solvent.
   ii. 1 M KCl has higher osmotic pressure than 1 M urea solution.
   iii. Blood cell swells up in water.
   iv. Measurement of osmotic pressure method is preffered for the determination of molar masses of
       macromolecules such as proteins and polymers.
   v. Aquatic animals are more comfortable in cold water than in warm water.
Q3. Differentiate between molarity and molality of solution. How can we change molality value into molarity
    value?
Q4. Explain the following:
   i. factors affecting colligative properties.
   ii. Name the type of deviation shown by a mixture of ethanol and acetone. What type of azeotrope is
       formed by mixing ethanol and acetone.
Q5. 3.9 g of benzoic acid dissolved in 4.9 g of benzene shows a depression in freezing point of 1.62 K. Calculate
    the Van’t Hoff factor and predict the nature of solute (associated or dissociated).
Q6. Calculate the mass of NaCl to be dissolved in 37.2 gm of water to lower the freezing point by 20 C, assuming
    that NaCl undergoes complete dissociation (K_f for water = 1.86 K Kg/mol)
Q7. Some ethylene glycol (HOCH₂CH₂OH) is added your cars cooling system along with 5 Kg of water. If
    the freezing point of water glycol solution is -15⁰C, What is the boiling point of the solution?
    (K_b = 0.52 K Kg/mol and K_f = 1.86 K Kg/mol for water)
Q8. Determine the osmotic pressure of a solution prepared by dissolving 2.5 x 10⁻² g of K₂SO₄ in 2L of water
    at 25⁰C, assuming that it is completely dissociated (R = 0.0821 Latm K⁻¹ mol⁻¹, molar mass)
Q9. Calculate the freezing point of solution containing 60 g of glucose (Molar mass = 180 g mol⁻¹) in 250 g
    of water. (K_f of water = 1.86 K Kg mol⁻¹)

UNIT II: ELECTROCHEMISTRY
Q1. Explain the following terms:
   i. Kohlrausch’s law of independent migration of ion
   ii. Cell constant
   iii. Limiting molar conductivity
   iv. Lead storage battery
   v. Standard hydrogen electrode
   vi. Conductivity
   vii. Electrolytic cell
   viii. Fuel cell
Q2. Difference between
   i. Conductivity and molar conductivity
   ii. Galvanic cell and fuel cell
   iii. Dry cell and mercury cell
   iv. Strong and weak electrolyte
Q3. Write cell reaction and Calculate the e.m.f of the following cell at 298 K:
   Cu²⁺ (10⁻¹ M) / Cu (s) || Ag(s) / Ag⁺ (10⁻³ M)
   (Given: E°_Ag⁺/Ag = 0.80 V, E°_Cu²⁺/Cu = +0.34 )
Q4. From the following molar conductivities at infinite dilution:
   λ⁰_m for Ba(OH)₂ = 457.6 Ω⁻¹cm² mol⁻¹, λ⁰_m for BaCl₂ = 240.6 Ω⁻¹cm² mol⁻¹, λ⁰_m for NH₄Cl = 129.8 Ω⁻¹cm² mol⁻¹. Calculate λ⁰_m for NH₄OH.
Q5. Calculate the time to deposit 1.27g of copper at cathode when a current of 2A was passed through the solution of copper sulphate. (Molar mass of copper = 63.5g/mol)

Q6. Predict the products of electrolysis in each of the following:
   i. An aqueous solution of AgNO₃ with silver electrode.
   ii. An aqueous solution of CuCl₂ with platinum electrode.

Q7. Give reason for the followings:
   i. Conductivity of a CH₃COOH decreases with dilution.
   ii. HCl does not give an acidic solution in benzene.
   iii. Rusting of iron is quicker in saline water than in ordinary water.
   iv. Mercury cell provides constant voltage throughout its lifetime.
   v. On electrolysis of an aq. Solution of NaCl, H₂ is liberated at cathode in spite of Na.
   vi. Dry cell become dead after a long time even if it has not been used.

Q8. Using the E° values of A and B, predict which is better for coating the surface of iron (E° Fe²⁺/Fe = -0.44 V) to prevent corrosion and why? Given: E° A²⁺/A = -2.73 V, E° B²⁺/B = -0.14 V (2016)

Q9. The conductivity of 2.5x10⁻⁴ mol L⁻¹ solution of HCOOH is 5.25 X10⁻⁵ S cm⁻¹. Calculate its molar conductivity and degree of dissociation (α).

Q10. Calculate ΔrG° and log Kc for the following reaction:

Cd²⁺(aq) + Zn(s) → Zn²⁺(aq) + Cd(s)

(Given: E° Zn²⁺/Zn = -0.763 V, E° Cd²⁺/Cd = -0.403 V)

Q11. Chromium metal is electroplated using an acidic solution containing CrO₃ according to the following equation:

CrO₃ (aq) + 6H⁺ + 6e⁻ → Cr(s) + 3H₂O

Calculate how many grams of chromium will be electroplated by 24000 coulombs. How long will it take to electroplate 1.5 g of chromium using 12.5 A current? [At. mass of Cr = 52g/mol, 1F = 96500Cmol⁻¹]

UNIT III: CHEMICAL KINETICS

Q1. Why equilibrium constant of a reaction does not change in the presence of a catalyst?
Q2. Why can not molecularity of any reaction be equal to zero?
Q3. How is half life period of a first order reaction related to its rate constant (K)?
Q4. The reaction SO₂Cl₂ → SO₂ + Cl₂, is a first order reaction with K₁ = 2.2 X 10⁻⁵ sec⁻¹ at 575 K. What percentage of SO₂Cl₂ will get decomposed in 90 minutes when the reaction is carried out at 575 K?
Q5. The rate of first order reaction is 0.04 molL⁻¹S⁻¹ at 10 minutes and 0.03 mol L⁻¹S⁻¹ at 20 minutes after initiation. Find the half life of the reaction.
Q6. For the reaction 2N₂O₅(g) → 4NO₂(g) + O₂(g) the rate of formation of NO₂ is 2.8X 10⁻³ Ms⁻¹. Calculate the rate of disappearance of N₂O₅(g).
Q7. The time required for 10% completion of a first order reaction at 298 K is equal to that required for its 25% completion at 308 K. If the Pre-exponential factor for the reaction is 3.56 X 10⁹ S⁻¹, calculate its rate constant at 318 K and also the energy of activation.
Q8. Consider the reaction R → P for which the change in concentration of R with time is shown by the graph:
   i. Predict the order of reaction.
   ii. What does the slope of the curve indicates?
Q 9. For a certain chemical reaction, variation in the concentration in [R] vs time (s) plot is given in figure:

For this reaction write or draw:

i) What is the order of the reaction?

ii) What are the units of rate constant $k$?

iii) Give the relationship between $k$ and $t_{1/2}$.

iv) What does the slope of line indicate?

v) Draw the plot $\log ([R]_0 / [R])$ vs time (s)

Q 10. Draw the plot of $\ln k$ vs $1/T$ for a chemical reaction. What does the intercept represent? What is the relation between slope and $E_a$?

UNIT IV: SURFACE CHEMISTRY

Q1. a. Write the dispersed phase and dispersion medium of milk.
   b. Write one similarity between physisorption and chemisorptions.
   c. Write the chemical method by which Fe(OH)$_3$ sol is prepared from FeCl$_3$.

Q2. Give specific term to show the effect of the following process:
   a. Ferric hydroxide is mixed with arsenic sulphide sol.
   b. Ferric chloride solution is mixed with freshly prepared precipitate of ferric hydroxide.
   c. A beam of light is passed through arsenic oxide solution.
   d. An emulsion is centrifuged.

Q3. Why is chemisorption referred to as activated adsorption?

Q4. Why do we add alum to purify water?

Q5. What happens when dialysis is prolonged?

Q6. Why does the sun look red at the time of setting? Explain on the basis of colloidal properties.

UNIT V: GENERAL PRINCIPLES AND PROCESS OF ISOLATION OF ELEMENTS

Q1. Write the principle of following:
   i. Zone refining    ii. Froth floatation process    iii. Chromatography

Q2. i. Write the Principle of Electrolytic Refining.
   ii. Why does copper obtained in the extraction from copper pyrites have a blistered appearance?
   iii. What is the role of depressants in the froth floatation process?

Q3. i. Write the principle of vapour phase refining.
   ii. What is the role of collectors in the froth floatation process? Give an example of a collector.
   iii. What is the role of flux in metallurgical process?

Q5. How are tin and lead purified?

Q6. Write the chemical reaction involved in the process of extraction of Gold.

Q7. Outline the principle of method used for refining of nickel and germanium.

Q8. Write the chemical reaction which take place in the following operations:
   i. Electrolytic reduction of Al$_2$O$_3$
   ii. Isolation of zinc from zinc blende

Q9. i. Graphite is used as anode but not diamond. Give reason.
   ii. Why cannot aluminium oxide be reduced by carbon?
UNIT V: p BLOCK ELEMENTS
Q1. Account for the following:
   i. SO₂ is reducing while TeO₂ is an oxidizing agent.
   ii. SF₄ is easily hydrolysed whereas SF₆ is not easily hydrolysed.
   iii. Although 'F' is more electronegative than 'O', the highest Mn fluoride is MnF₄ where as the highest oxide is Mn₂O₇.
   iv. In aqueous solution HI is a stronger acid than HCl.
   v. Neon is used in traffic lights signals.
   vi. Fluorine does not exhibit positive oxidation state.
   vii. Electrongain enthalpy with negative sign of fluorine is less than that of chlorine.
   viii. The two oxygen – oxygen bond lengths in ozone molecule are identical.
   ix. Sulphur has a greater tendency for catenation than oxygen.
   x. It is difficult to study the chemistry of radon.
   xii. Noble gases form compounds with fluorine and oxygen only.
   xiii. Only Xe can form highest number of compounds among noble gases.

Q2. Complete the following chemical reaction
   i. XeF₄ + O₂F₂
   ii. XeF₆ + KF
   iii. I₂ + conc HNO₃
   iv. 6 XeF₄ + 12H₂O
   v. NaOH +Cl₂
   vi. XeF₂+ H₂O
   viii. HgCl₂+ PH₃
   ix. U+ ClF₃
   x. XeF₂ + PF₅

Q3. Draw the Structure of following molecules:
   i) XeF₆   ii) H₂S₂O₇   iii) XeF₂   iv) BrF₃/ClF₃
   v) XeF₄   vi) XeO₃   vii) XeOF₄   viii) HClO₃

Q4. Arrange the following in order of the property mentioned:
   (a) HCl, HBr, HI, HF (increasing acid strength)
   (b) HClO₄, HClO₃, HClO₂ (increasing oxidizing power)
   (c) F₂,Cl₂,Br₂ and I₂ (increasing bond dissociation enthalpy)

Q5. On reaction with Cl₂, phosphorus forms two types of halides ‘A’ and ‘B’. Halide a is yellowish-white powder but halide ‘B’ is colourless oily liquid. Identify A and B and write the formulas of their products.

Q7. A translucent white waxy solid (A) on heating in an inert atmosphere is converted into its allotropic form (B). Allotrope (A) on reaction with very dilute aqueous KOH liberates a highly poisonous gas (C) having rotten fish smell. With excess of chlorine (C) forms (D) which hydrolyses to compound (E). Identify (A) to (E).

Q8. Arrange the following in increasing order of property indicated giving reason:
   (i) Hydride of group 15- boiling points
   (ii) Hydride of group 17-acidic strength
   (iii) Hydride of group 16-reducing character addition of concentrated

Q9. When dilute ferrous sulphate solution is added to an aqueous solution containing nitrate ion followed by careful addition of concentrated sulphuric acid along the sides of test tube, a brown ring is formed at the interface between the sulphuric acid layers. Which anion is confirmed by the appearance of brown ring? What is the composition of the brown ring?

UNIT VII: d-BLOCK & f BLOCK ELEMENTS
Q1. Chromium is a typical hard metal while mercury is a liquid. Explain why?
Q2. Why are the ionization energies of 5d elements greater than 3d elements?
Q3. Why is first ionization enthalpy of Cu higher than that of Na?
Q4. Why is it not advisable to dissolve KMnO₄ in Conc. H₂SO₄?
Q5. Write the electronic configuration of Gadolinium (Z=64) and its most stable oxidation state?
Q6. E° of Cu is +0.34 V while that of Zn is -0.76 V, Explain.
Q7. What is the basic difference between electronic configuration of transition and inner-transition elements?
Q8. Explain why mercury (I) ion exists as Hg₂²⁺ ion while copper (I) ion exists as Cu⁺ ion.
Q9. Answer the following questions:
   (i) Which element of the first transition series has highest second ionisation enthalpy?
   (ii) Which element of first transition series has highest third ionisation enthalpy?
   (iii) Which element of the first transition series has lowest enthalpy of atomisation?
Q10. Give reasons:
   (a) Transition metals have high enthalpies of atomization.
   (b) Among the lanthanoids, Ce (III) is easily oxidised to Ce (IV).
   (c) The second and third transition series elements have almost similar atomic radii.
   (d) Iron has higher enthalpy of atomization than that of copper.
Q11. A violet compound of manganese(A) decomposes on heating to liberate oxygen and compounds(B) and (C) of manganese are formed. Compound (C) reacts with KOH in the presence of potassium nitrate to give Compound (B). On heating compound (C) with conc. H₂SO₄ and NaCl, chlorine gas is liberated and a compound (D) of manganese along with other products is formed. Identify compounds A to D and also explain the reactions involved.
Q12. Use the data to answer the following and also justify giving reason:
   Cr Mn Fe Co
   E₀M²⁺/M -0.91 -1.18 -0.44 -0.28
   E₀M³⁺/M²⁺ -0.41 +1.57 +0.77 +1.97
   i. Which is a stronger reducing agent in aqueous medium, Cr²⁺ or Fe²⁺ and why?
   ii. Which is the most stable ion in +2 oxidation and why?
Q13. Explain the method of preparation of sodium dichromate from chromite ore. Give the equation representing oxidation of ferrous salts by dichromate ion.

UNIT VIII: COORDINATION CHEMISTRY
Q1. Using IUPAC norms write the formulae for the following:
   a. Tetraamminechloridonitrato-N-platinum(IV)sulphate
   b. Tris(ethane-1,2-diamine)chromium(III) chloride
   c. Potassium Tetrahydroxozincate(II)
   d. Potassium trioxalatoaluminate(III)
   e. Dichloridobis(ethane-1,2-diamine)cobalt(III)
Q2. a. What type of isomerism is shown by the complex [Co(NH₃)₅(SCN)]²⁺?
   b. Why is [NiCl₄]²⁻ paramagnetic while [Ni(CN)₄]²⁻ is diamagnetic?
   c. Why are low spin tetrahedral complexes rarely observed?
Q3. Why only transition metals are known to form pie complexes?
Q4. Explain the following cases giving appropriate reasons:
   a. Co²⁺ is readily oxidised to Co³⁺ in the presence of strong ligand.
   b. CO is stronger ligand than NH₃ for many metals.
Q5. Give reason for the following:
   a. [CoF₆]³⁻ is a high spin complex ion.
   b. Draw the geometrical isomers of complex compound [Pt(NH₃)₂Cl₂].
Q6. What happened when potassium ferrocyanide solution is added to a ferric salt solution?
Q7. Give names of two complexes which are used in medicines.

Q8. What type of ligands form chelates?

Q9. Write type of hybridization and number of unpaired electron in the following complexes:
   a. \([{\text{CoF}_6}]^{-3}\)  
   b. \([{\text{Co(NH}_3)_6}]^{+3}\)  
   c. \([{\text{PtCl}_4}]^{-2}\)

Q10. When a coordination compound \(\text{CrCl}_3\cdot 6\text{H}_2\text{O}\) is mixed with \(\text{AgNO}_3\), two moles of \(\text{AgCl}\) are precipitated per mole of the compound. What is the structural formula of the coordination compound?

UNIT IX: HALO ALKANES & HALOARENES

Q1. Explain the following and give reactions where required:
   (i) Chirality  
   (ii) Asymmetric carbon  
   (iii) Racemic mixture  
   (iv) Enantiomers  
   (v) Finkelstein Reaction  
   (vi) Swarts Reaction  
   (vi) Sandmayer’s reaction

Q2. Discuss the mechanism of \(\text{S}_1\) and \(\text{S}_2\) reaction of haloalkanes.

Q3. Account for the following:
   i. Haloarenes are much less reactive than haloalkanes towards nucleophilic substitution reaction.
   ii. Benzyl halides show high reactivity towards \(\text{S}_1\) reaction.
   iii. Allyl chloride is more reactive than n-propyl chloride towards nucleophilic substitution reaction.
   iv. Haloalkanes react with \(\text{KCN}\) to give alkyl cyanide as main product while with \(\text{AgCN}\) they form isocyanide as main product.
   v. \(\text{p-}\) nitrochlorobenzene undergoes nucleophilic substitution faster than chlorobenzene.

Q5. i. Which compound in the following pairs will react faster in \(\text{S}_1\) reaction with \(\text{OH}\) & why?
   a. \(\text{CH}_3\text{CHClCH}_2\text{CH}_3\) or \(\text{C}_6\text{H}_5\text{CH}_2\text{Cl}\)
   b. Among the following compounds which one is more easily hydrolysed and why?
      a. \(\text{CH}_3\text{CHClCH}_2\text{CH}_3\) or \(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}\).  
      b. \(\text{C}_6\text{H}_5\text{Cl}\) OR \(\text{C}_6\text{H}_5\text{CH}_2\text{Cl}\)

Q6. How can the following conversion be carried out:
   i. Aniline to bromo benzene
   ii. Ethyl bromide to ethyl iso cyanide
   iii. Ethyl chloride to ethyl nitrite

Q6. Complete the following equations:
   i. \(\text{C}_6\text{H}_5\text{CH}=:\text{CH}_2 + \text{HBr} \rightarrow\)
   ii. \((\text{CH}_3)_2\text{CHCl} + \text{Na (dry ether)} \rightarrow\)
   iii. \(\text{CH}_3\text{Br} + \text{AgF} \xrightarrow{\text{Heat}}\)
   iv. \(\text{CH}_3\text{CH}_2\text{Br} + \text{NaI (dry acetone)} \rightarrow\)
   v. \(\text{C}_6\text{H}_5\text{N}_2\text{Cl} \xrightarrow{\text{Cu/HCl}}\)
   vi. \(\text{CH}_3\text{CH}_2\text{CH}=:\text{CH}_2 + \text{HBr (peroxide)} \times \text{NaI (acetone)} \rightarrow\)
   vii. \(\text{CH}_3\text{CH}=:\text{CH}_2 + \text{HBr (peroxide)} \times \text{NaI (acetone)} \rightarrow\)

Q7. When dilute ferrous sulphate solution is added to an aqueous solution containing nitrate ion followed by careful addition of concentrated sulphuric acid along the sides of test tube, a brown ring is formed at the interface between the solution and sulphuric acid layers. Which anion is confirmed by the appearance of brown ring? What is the composition of the brown ring?

UNIT X: ALCOHOLS, PHENOLS AND ETHERS

Q1. Give reasons for the following:
   i. Alcohols act as weak bases.
   ii. Phenol has a smaller dipole moment than methanol.
   iii. Phenols do not give protonation reactions readily.
iv. O=C=O is non polar while R-O-R is polar.
v. Nucleophilic substitution reactions are not very common in phenols.
vi. Lewis acid is not required in bromination of phenol.
vii. Ethers can be prepared by Williamson synthesis in which an alkyl halide is treated with sodium alkoxide. Di-tert-butyl ether can’t be prepared by this method.
viii. Cleavage of phenyl alkyl ether with HBr always gives phenol and alkyl bromide and not bromobenzene and alcohols.
Q2. Give a chemical test to distinguish between the following pair of compounds.
i. Phenol and Hexyl alcohol
ii. Propan-2-ol and Benzyl alcohol
Q3. Arrange water, ethanol and phenol in increasing order of acidity and give reason for your answer.
Q4. Explain the mechanism of the following reactions:
i. Acid catalysed dehydrogenation of an alcohol forming an alkene.
ii. Preparation of alcohol by hydration of alkene.
iii. Preparation of ethoxy ethane from ethanol.
Q5. How do you convert the following:
i. Ethanal to Propan-2-ol
ii. Phenol to anisole
iii. Picric acid from phenol.
iv. 2-Methylpropene from 2-methylpropanol.
v. Propanone from cumene.
Q10. What happens when (Give equations only):
i. Isobutylene is treated with dilute sulphuric acid.
ii. Ethyl alcohol is treated with red phosphorus and HI.
iii. Phenol is treated with ice cold bromine dissolved in Carbon disulphide.
iv. Ethylene is treated with hypochlorous acid.
v. Benzyl alcohol treated with potassium permanganate and dilute HCl.

UNIT XII: ALDEHYDE, KETONES & CARBOXYLIC ACID
Q1. Write the IUPAC name of the following:
i. (CH₃)₂C=CHOCH₃
ii. CH₃CH(Br)CH₂CONHCH₃
Q2. Draw the structural formula of:
i. 4-Nitropropiophenone
ii. 2-Hydroxycyclopentanecarbaldehyde
Q3. Sodium bisulphite is used for the purification of aldehydes and ketone. Explain.
Q4. How are formalin and trioxane related to methanol?
Q5. An ether would possess a dipole moment even if alkyl groups present in it are identical. Explain.
Q6. Why do the acyl halides have lower boiling point than corresponding carboxylic acid inspite of their greater molecular mass?
Q7. Melting point of an acid with even number of carbon atoms is higher than those of its neighbours with odd number of carbon atoms. Why?
Q8. Carboxylic acids do not give characteristic reactions of carbonyl group. Explain.
Q9. Illustrate the following name reactions:
i. Aldol condensation reaction
ii. Stephen reduction
iii. Hell – Volhard Zelinsky reaction
iv. Etard reaction
v. Decarboxylation
vi. Clemmensen reduction
Q10. An unknown aldehyde ‘A’ on reacting with alkali gives alpha hydroxy aldehyde, which reacts with water to form an unsaturated aldehyde, 2-butenal. Another aldehyde ‘B’ undergoes
disproportionation reaction in the presence of conc. Alkali to form products C and D. C is an aryl alcohol with the formula C₇H₈O.

i. Identify A and B.

ii. Write the sequence of reactions involved.

iii. Name the product when 'B' react with Zinc amalgam and hydrochloric acid.

Q11. A compound X (C₂H₄O) on oxidation gives Y (C₂H₄O). X Undergoes haloform reaction. On treatment with HCN, X form a product Z which on hydrolysis gives 2- hydroxyl propanoic acid.

i. Identify X and Y.

ii. Write the sequence of reactions involved.

iii. Name the product when 'X' react with dil. NaOH.

Q12. Bring out the following conversions:

i. Acetic acid to ethyl amine

ii. Formaldehyde to n-butane

iii. Acetophenone to benzoic acid

iv. Propanoic acid to ethanoic acid

v. Acetaldehyde to butan-2-oic acid

Q13. An alkene with molecular formula C₅H₁₀ on ozonolysis gives a mixture of two compounds, B and C. Compound B gives positive Fehling test and also reacts with iodine and NaOH solution. Compound C does not give Fehling solution test but forms iodoform. Identify the compounds A, B and C.

UNIT XII: ORGANIC COMPOUND CONTAINING NITROGEN

Q1. What reagent is used to convert an amide into an amine with the same number of carbon atom?

Q2. Why do nitro compound have high boiling points in comparison with other compounds of same molecular mass?

Q3. Why is an amide is more acidic then amine?

Q4. How is 2,4 - Dinitrophenylhydrazine prepared from chlorobenzene?

Q5. Can we prepare aniline by gabrial-phthalamide reaction?

Q6. Amines are more basic than comparable alcohols. Explain.

Q7. i. How can you convert an amide into an amine having one carbon less than the starting compound?

ii. Give the IUPAC name and the structure of amine obtained by the above method if the amide is 3-chlorobutanamide.

Q8. tert-Butylamine can not be prepared by the action of NH₃ on tert-butyl bromide. Explain why? suggest a convenient method for the preparation of tert-butylamine.

Q9. Identify the products A to E in the following sequence of reactions:

Q10. Illustrate the following name reactions:

i. Carbarylamine reaction

ii. Diazotisation

iii. Hoffmann –bromamide reaction

iv. Coupling reaction
UNIT XIII: BIOMOLECULES
Q1. What are the products of hydrolysis of the following:
   i. Sucrose
   ii. Lactose
   iii. Maltose
Q2. Write the difference between the following:
   i. α-helix and β-pleated structure of protein
   ii. DNA and RNA
   iii. Nucleotide and Nucleoside
   iv. Reducing and non-reducing sugar
   v. Essential and non-essential proteins
   vi. Globular and Fibrous proteins
Q3. What is meant by glycosidic linkage?
Q4. What type of linkage is present in nucleic acids?
Q5. What is meant by denaturation of proteins?
Q6. Write structural difference between starch and cellulose.
Q7. Define the following terms:
   i. Peptide linkage
   ii. Anomers
   iii. Zwitter ion
   iv. Invert sugar
Q8. i. How are hormones and vitamins different in respect of their source and functions?
   ii. Give one example each of: a. Globular protein
   iii. Fibrous protein
Q9. i. Write the structural and functional differences between DNA and RNA.
   ii. Name the only vitamin which can be synthesized in our body. Name the disease caused due to deficiency of this vitamin.
Q10. Write the products formed when glucose is treated with:
   i. HI
   ii. Br_2 water
   iii. Conc. HNO_3
Q11. i. Deficiency of which vitamin causes night blindness?
   ii. What type of linkage is responsible for the formation of proteins?
   iii. Name the base that is found only in RNA only.

UNIT XIV: POLYMERS
Q1. Define the term ‘Homopolymerisation’ giving an example.
Q2. Write the names and structures of the monomers of the following polymers:
   i. Glyptal
   ii. Teflon
   iii. PVC
   iv. Terylene
   v. Melamine formaldehyde
   vi. Buna-N
   vii. Bakelite
Q3. Which of the following is a natural rubber polymer?
   Buna-S, Proteins, PVC
Q4. What is the role of sulphur in vulcanization of Rubber?
Q5. In nylon 6,6 what does the designation ‘6,6’ mean?
Q6. Differentiate thermoplastic and thermosetting polymers. Give one example of each.
Q7. What is a biodegradable polymer? Give an example of a biodegradable aliphatic polyester.
Q8. Describe the classification of polymers on the basis of structure.

UNIT XV CHEMISTRY IN EVERY DAY LIFE
Q1. What are limited spectrum antibiotics? Give one example.
Q2. Define Antacids with example and would it be advisable to take antacids for a long period of time, give reason.
Q3. Explain the following terms with suitable examples: i. Cationic detergents
   ii. Anionic detergents
Q2. Differentiate between disinfectants and antiseptics. Give one example of each group.
Q3. What are food preservatives? Name two such substances.
Q4. i. Give two example of macromolecules that are chosen as drug targets.
   ii. Why is use of aspartame limited to cold foods and soft drinks?
Q5. Name the sweetening agent used in the preparation of sweets for a diabetic patient.
Q6.i. Which one of the following is a food preservative? Equanil, Morphine, Sodium Benzoate, Aspartame. ii. Why is bithional added to soap? iii. What class of drugs is ranitidine?