

M.Sc Chemistry I Semester

QUESTION BANK

ORGANIC CHEMISTRY I

PART A

UNIT I

1. Define optical activity.
2. Define chirality.
3. What is meant by R,S notation?
4. What are erythro and threo compounds?
5. What is meant by Asymmetric synthesis?
6. State Cram's rule.
7. Distinguish between Geometrical isomer and optical isomers.
8. Define homotopic and enantiotopic hydrogen.
9. Explain the term asymmetric and dissymmetry in stereochemistry.

UNIT II

1. What is conformational analysis?
2. Give the structure of CIS and trans decalin.
3. What is meant by 1,2 disubstituted ethane?
4. How conformation affects the reactivity of substituted cyclohexanols?
5. Write the reduction product of cyclohexanones.

UNIT III

1. What is Nucleophilic substitution?
2. Name some nucleophiles used in organic chemistry.
3. What is meant by kinetics?
4. How free energy is related in Hammett equation.
5. What is neighbouring group participation in organic chemistry?
6. Distinguish between Allylic and Vinylic carbons.
7. Why CN, NO₂ are called ambident nucleophiles?

8. Why active methylene group is highly reactive?

9. What is acylation reaction? Give example?

UNIT IV

1. Name the reagent employed in the alkylation of amines.

2. Write an example for nucleophilic substitution involving diazonium ion.

3. What is Ziegler alkylation?

4. How benzyne intermediate can be generated?

5. Give two examples of Nucleophilic substitution at carbon bonded to hetero atoms.

UNIT V

1. What is a diazonium coupling reaction?

2. What is meant by a formylation reaction?

3. How a trisubstituted benzene can be synthesized?

4. Write the applications of Pyridine-N-oxide.

5. How an electrophilic reaction can be carried out using pyridine.

PART B

UNIT I

1. How Chiral molecules can be classified? Write briefly on the dissymmetry of allenes and biphenyls?

2. Write a detailed account of dissymmetry of cyclononene and helical structured molecules.

3. Give a detailed account of interconversion of sawhorse newman and Fischer projections with examples.

4. Describe E, Z nomenclature of olefin in detail with suitable examples.

5. Elaborate on Geometrical and optical isomerism of disubstituted cyclopropanes.

6. Describe how enantiotopic homotopic and diastereotopic hydrogen can be identified in prochiral compounds.

7. Explain with detail about stereo specific and stereo selective reactions with examples.

UNIT II

1. Discuss the conformational analysis of 1,2 disubstituted ethane derivatives.

2. Explain the stereo chemical aspects of disubstituted cyclohexanes. Citing examples.

3. Write a detailed account of reactivity of substituted cyclohexanols with respect to oxidation and acylation reactions.

4. Elaborate on conformation and stereochemistry of methyl decalin.

UNIT III

1. Describe the kinetic and non kinetic methods of determining organic reactions.

2. Derive Hammett equation and write its applications.

3. Write SN1, SN2, and SNi mechanism giving suitable examples.

4. Describe how neighbouring group participation is involved in the aliphatic nucleophilic substitution reactions.

5. Write a detailed account of reactivity, structural and solvent effects in bridge head systems.

6. Write briefly on:

A. Von-Braun reaction

b. Claisen and Dieckmann reaction.

7. Write a short note on hydrolysis of esters.

UNIT IV

1. Discuss the nucleophilic substitution at carbon doubly bonded to hetero atoms.

2. Describe alkylation and acylation reactions of active methylene carbon compounds.

3. Write short notes on:

a. Hydrolysis of esters of aromatic compounds.

b. Applications of Claisen and Dieckmann condensation aromatic compounds.

4. Give a detailed account of methods for the generation of benzyne intermediates with nucleophilic substitution reactions.

5. Discuss Chichibabin reaction in detail and give its applications.

UNIT V

1. What is an arenium ion and explain its importance in the aromatic electrophilic substitution reactions?

2. Write briefly on the following a. Formylation reaction. B. Gattermann reactions.

3. Discuss Vilsmeier-Hack reaction and Reimer-Tiemann reaction in detail.

4. Write the methods of synthesis of symmetrical tribromobenzene.

5. Describe electrophilic substitution of pyrrole and thiophene giving examples.

INORGANIC CHEMISTRY I

PART A

UNIT I

1. What is meant by Isopolyacids?
2. Give any two structure of silicates.
3. What is meant by molecular sieves?
4. Write any two application of silicates?
5. Give short notes on Polysulphur nitrogen compounds.
6. Write any two properties of heteropolyacids of vanadium?
7. Write any two properties of silicates?
8. Give short notes on Polyorganophosphazenes
9. Write any two properties of silicates?
10. What is meant by heteropolyacids ?

UNIT II

1. Give two examples of boron hydride.
2. Define Wade's rules.
3. Write any two preparation of boron hydrides
4. What is meant by metal cluster?
5. What is meant by carboranes
6. What is meant by polyhedral boranes?
7. What is meant by hydro borate ion ?

UNIT III

1. Define quantum dots.
2. What are nanoparticles?
3. Write any two properties of nanoparticles?
4. What is meant by nanorods?
5. What is meant by nanotubes?
6. Give two application of nanoparticles.

7. Define graphene.
8. What is meant by metallic nano particles
9. Define core shell.

UNIT IV

1. Write any two inadequacies of VB theory?
2. Define spectrochemical series.
3. Write the arrangement of electron in octahedral complex in strong ligand field if the coordination number is 8
4. Write any two application of crystal field theory ?
5. Write a short note on spectral properties of the complex?
6. Give short notes on LCAO methods .
7. Write any two thermodynamics properties of complex?
8. Draw the d orbital splitting in octahedral complex.
9. Draw the d orbital splitting in octahedral complex.
10. Draw the d orbital splitting in square planar complex.

UNIT V

1. Define chelate effect.
2. What is meant by Schiff base?
3. Give two factors affecting the stability of complex.
4. What is meant by crown ether?
5. What is meant by cryptands?
6. Define chealting agents
7. Write short notes of replacement titrations?
8. What are the different types of EDTA titrations?
9. Define optical rotator dispersion.
10. What is meant by optical rotatory dispersion.
11. What is meant by circular dichroism.

PART B

UNIT I

1. Explain in detail about heteropolyacids of vanadium and chromium?
2. Explain in detail about heteropolyacids of molybdenum and tungsten?
3. Describe in detail about structure, properties and application of silicates?
4. Give the detailed account of polysulphur nitrogen compound?
5. Explain in detail about isopolyacids of molybdenum and tungsten?
6. Give the detailed account of polyorganophosphazenes compound?
7. Explain in detail about isopolyacids of vanadium and chromium?

UNIT II

1. Write the preparation, properties of any five boron hydrides.
2. Describe in detail about multiple metal-metal bonds.
3. Give the detailed account of polyhedral boranes.
4. What is meant by carboranes. Give the detailed account of carboranes?
5. Explain in detail about metal cluster? Give the detailed account of chemistry of low molecularity metal clusters upto trinuclear metal clusters.
6. Give the detailed account of metallo carboranes.
7. Give the detailed account of hydroborate ions.

UNIT III

1. Give the detailed account of properties of nanoparticle.
2. Explain the synthesis of nanoparticles.
3. Explain about the classification of nanostructure material.
4. Explain in detail about quantum well, quantum wires and quantum dots.
5. Describe in detail about nanorods.
6. Describe in detail about nanotubes.
7. Give the detail account of carbon nanotube
8. Describe about graphene in detail.
9. Explain about core shell and quantum well structure.

UNIT IV

1. Write the inadequacies of VB theory
2. Describe the crystal field splitting in octahedral field.
3. Describe the crystal field splitting in tetrahedral field.
4. Describe the crystal field splitting in square planar field.
5. Write about the application of crystal field theory.
6. Describe in detail about the magnetic properties of low spin and high spin complexes.
7. Explain in detail about Ligand field theory.
8. Explain in detail about MO theory.

UNIT V

1. Write in detail about the factor affecting the stability of complexes.
2. Give the detail account of types of EDTA titrations.
3. Explain about direct and back titration in detail.
4. How can we determine the stability constant by spectrophotometric, polarographic and potentiometric methods and detail.
5. Explain in detail about stereo chemical isomerism in inorganic complexes.

PHYSICAL CHEMISTRY I

PART A

UNIT I

1. What is temperature co-efficient?
2. Define collision cross section.
3. What is probability factor?
4. What are the limitation of transition state theory?
5. What is enthalpy, entropy?
6. What is activation energy?

UNIT II

1. Define dielectric constant.
2. What is ionic strength?
3. What is salt effect?
4. What is kinetic isotopic effect?
5. What is primary and secondary isotopic effect?
6. What is linear free energy relationship?
7. State Bronsted catalysis law.
8. What is catalyst and promoter?
9. What are the different type of catalysis?
10. What is specific acid-base catalysis?
11. What is general acid and base catalysis?
12. What is specific acid and base catalysis?

UNIT III

1. What is symmetry element?
2. What is symmetry operation?
3. What proper and improper axis of rotation?
4. What is plane of symmetry?
5. What is center of symmetry?

6. What is abelian and non abelian groups?
7. Define order of group.
8. Define subgroup.
9. What is class?
10. Define point group.
11. State orthogonality theorem.
12. What are the properties of reducible and irreducible representation?

UNIT IV

1. Define isomorphism.
2. Which of the following molecule may be poles? Pyridine, nitromethane

UNIT V

1. What is Black body? Give example.
2. What is threshold frequency?
3. Define Compton shift.
4. What are the postulates of quantum theory?
5. Define wavelength, frequency wave number.
6. State Heisenberg's uncertainty principle.

Part B

UNIT I

1. Discuss the collision theory of Bimolecular reaction.
2. Explain activated complex theory for Bimolecular reaction.
3. Explain molecular beam methods.
4. Write note on potential energy surface.
5. Explain the effect of temperature on reaction rate.
6. Calculate the free energy, enthalpy of following reaction.

UNIT II

1. Explain the effect of pressure on rate of reaction in solution.

2. Explain the effect of dielectric constant on rate of reaction.
3. Describe the effect of ionic strength on rate of reaction.
4. Explain kinetic isotopic effect.
5. Derive Hammett equation.
6. Explain Taft equation.
7. Explain the mechanism of acid, base catalysis.

UNIT III

1. Explain symmetry element and its operation.
2. Explain reducible representation of point group.
3. Explain irreducible representation.
4. State and explain orthogonality theorem and its consequences.
5. Construct character table for NH_3 .
6. Construct character table for H_2O
7. Explain symmetry adapted combination of atomic orbital for water.

UNIT IV

1. Explain mutual exclusion principle.
2. Give the applications of group theory.
3. Explain symmetry selection rule for IR spectra?
4. Explain symmetry selection rule for Raman and electronic spectra.
5. Explain the vibrational modes in H_2O molecules.

UNIT V

1. Explain black body radiation in quantum chemistry.
2. Explain photo electric effect.
3. Explain Compton effect.
4. Derive de Broglie equation.
5. State and explain Heisenberg's uncertainty principle.

BIO-ORANGIC CHEMISTRY

PART A

UNIT I : CHEMISTRY AND METABOLISM CARBOHYDRATES

1. Define carbohydrate.
2. How carbohydrate are classified.
3. What is glycolysis.
4. Give Haworth formula for glucose.
5. Mention the classification of carbohydrates.
6. Give the structure of glycogen.
7. Write two biological role of carbohydrate.
8. Give two chemical properties of glucose.
9. Give two chemical properties of maltose.

UNIT II : CHEMISTRY AND METABOLISM OF AMINO ACIDS AND PROTEINS

1. Define Amino acids.
2. Mention the classification of amino acids.
3. Differentiate essential amino acids with non-essential amino acids.
4. What are conjugated proteins.
5. Give two biological function of proteins.
6. Define domination.
7. What is Dansyl chloride method.

UNIT III : CHEMISTRY AND METABOLISM OF LIPIDS

1. Define lipids.
2. What is meant by acetyl number?
3. Give the biological importance of cholesterol.
4. Define saponification number.
5. Mention the classification of lipids.

UNIT IV : NUCLEIC ACIDS

1. Mention the various types of RNA.

2. Mention the various types of DNA
3. Write the biological function of RNA
4. Write the biological function of DNA
5. Write the structure of purine and pyrimidine base.

UNIT V : VITAMINS

1. Define vitamin.
2. Mention the classification of vitamins.
3. Write structure of vitamin A & D.
4. Write any two biochemical rule for fat soluble vitamins.

PART B

UNIT – I : CHEMISTRY AND METABOLISM CARBOHYDRATES

1. Explain in detail about the glycolysis of carbohydrate.
2. Give detailed account of structure and properties of cellulose.
3. Explain the physical and chemical properties of sucrose.
4. Explain the linear and ring structure of glucose and fructose.
5. Explain the physical and chemical properties of glucose and fructose.
6. With a neat diagram, explain the structure and properties of polysaccharides.
7. Discuss the biological role of carbohydrate.
8. Discuss the chemical properties of maltose.

UNIT II : CHEMISTRY AND METABOLISM OF AMINO ACIDS AND PROTEINS

1. Explain in detail about urea cycle.
2. How are protein classified based on scope and composition.
3. Discuss in detail about the end group analysis of N-terminal analysis and Edman's method.
4. What do you understand by the transamination reaction.
5. Explain the physical properties and reactions of amino acids.
6. Explain the biological function of proteins.
7. Discuss the primary structure of proteins.

UNIT III : CHEMISTRY AND METABOLISM OF LIPIDS

1. Write the biological importance of lipids.
2. How does lipid are classified? Explain each one of them.
3. Explain the chemical properties and biological importance of cholesterol.
4. Write a detailed account on bile acids.
5. Explain the properties of lipids.

UNIT IV : NUCLEIC ACIDS

1. Discuss in detail about the biological function of DNA.
2. Explain the various types of DNA structures.
3. Differentiate between DNA and RNA.
4. Give detailed account on gentic code.
5. Discuss in detail about the biological function of RNA.

UNIT V : VITAMINS

1. What are B-complex vitamins? Describe their physiological functions.
2. Discuss about ascorbic acid in detail
3. Describe the functions and deficiency disease caused by vitamin D
4. Write in detail about the sources, functions and deficiency manifestations of vitamin A
5. Write a note on occurrence and structure of vitamins.
6. Explain the biochemical rules and daily requirements of vitamins.
7. Explain in detail about classification of vitamins.

QUESTION BANK

PHYSICAL CHEMISTRY II

PART A

UNIT 1

1. Define catalyst
2. What is Enzyme?
3. What is steady state approximation?
4. What is chain reaction? Mention the steps involved in it
5. What is parallel reaction
6. What is reversible reaction? Give some example
7. What is consecutive reaction? Give an example
8. Define relaxation
9. Define relaxation time and constant.
10. What is flash photolysis
11. Define competitive inhibition

UNIT II

1. What is turn over number?
2. Define catalyst
3. What is Enzyme?
4. Define denaturation.
5. What is surface reaction?
6. What are the steps involved in Langmuir –Hinshelwood mechanism?
7. What is adsorption coefficient?
8. Define adsorption and adsorbent
9. What is heterogeneous catalysis?
10. What is isotherm?

UNIT III

1. What is Eigen value ?
2. What is Eigen function?
3. Write any three postulates of quantum mechanics?
4. What is degeneracy?

5. Define zero point energy
6. What is normalized wave function
7. What is Hermitian operator?

UNIT IV

1. What is a rigid rotor?
2. Define force constant
3. Give the general equation of one dimensional simple harmonic oscillator.
4. Give the Schrodinger equation for hydrogen atom.
5. How is angular momentum in quantum number possessed?
6. What is meant by Zeeman effect.
7. What is meant by magnetic quantum number.
8. What is meant by azimuthal quantum number.

UNIT V

1. What is rotational energy.
2. What is meant by vibrational energy.
3. What is meant by electronic energy.
4. Define Heisenberg uncertainty principle.
5. Write short note on Frank-Condon principle.
6. What is meant by selection rule.
7. What is meant by signal to noise ratio?

PART B

UNIT I

1. Discuss the kinetics of reversible reaction
2. Explain the kinetics of consecutive reaction
3. Discuss the kinetics of chain reaction.
4. Explain the Rice-Herzfeld mechanism for decomposition of acetaldehyde
5. Explain the Rice-Herzfeld mechanism for hydrobromination
6. Write short notes on Explosion limits
7. Describe the stopped flow method for studying kinetics of fast reaction
8. Explain the Flash photolysis with neat diagram?
9. Describe the Relaxation method for studying kinetics of fast reaction
10. Describe the Temperature and pressure jump method for studying kinetics of fast reaction

UNIT II

1. Discuss the mechanism and kinetics of Michael-Menten equation
2. Describe the pH dependence of rate constant of catalyzed reaction
3. Explain the effect of concentration of substrate on rate of catalyzed reaction?
4. Describe the effect of temperature on rate of catalyzed reaction
5. Write short note on inhibition of enzyme catalyzed reaction.
6. Explain Langmuir adsorption isotherm?
7. Describe BET adsorption isotherm.
9. Explain Langmuir-Linshelwood mechanism for uni and Bimolecular reaction?
10. Write short note on adsorption co-efficient and its significance
11. Explain the kinetics and mechanism of surface reaction catalyzed by metals and semiconductor oxides ?

UNIT III

1. Discuss the solution of Schrodinger equation for a particle in a three-dimensional box
2. Discuss the solution of Schrodinger equation for a particle in a one-dimensional box
3. Discuss the solution of Schrodinger equation for a particle in a ring
4. Explain the quantum mechanical postulates?

UNIT IV

1. Discuss in detail about one-dimensional simple harmonic oscillator.
2. Give the detailed account of rigid rotor.
3. Explain the Schrodinger equation for hydrogen atom.
4. Discuss the physical significance of quantum number.

UNIT V

1. Explain in detail about the Quantization of energy.
2. Discuss in detail about the Franck – Condon principle.
3. Explain in detail about collision broadening and Doppler broadening?
4. Explain in detail about spectral line and quantization of energy

POLYMER CHEMISTRY

PART A

UNIT I

1. What are natural polymers?
2. What is ionic polymerization?
3. What are ring opening polymerization? Give an example.
4. What is copolymerization?
5. What are block polymers?
6. Write the preparation of graft copolymers.

UNIT II

1. What is bulk polymerization? Mention its two advantages.
2. Define inter facial polycondensation.
3. What are solution phase polymerization?
4. What are gas phase polymerization?
5. What is polydispersity index?
6. What is glass transition temperature?
7. What are crystallinity polymers?
8. Write any two properties of crystallinity polymers?

UNIT III

1. What is calendaring?
2. Define rotational casting.
3. What is thermoforming?
4. Write the preparation of PVC.
5. What is Bakelite's?
6. What are epoxy polymer? Mention any two uses of epoxy resin.

UNIT IV

1. What are polyesters? Give an example.
2. What is spinning technique?
3. What are silicone rubber?
4. What is SBR?
5. What is neoprene?
6. What are polysulphides?
7. What do you mean conducting polymer? Give Example.

UNIT V

1. What is thermal degradations?
2. Define hydrolytic degradations of polymer.

3. What are fillers? Give an example.
4. What are thermal stabilizer? Give an example.
5. What are photo stabilizer?
6. What are bio-degradable polymer? Give an example.

PART B

UNIT I

1. Give detailed account on classification of stereochemistry of polymers.
2. Explain the mechanism of free radical polymerization.
3. Discuss ionic polymerization mechanism in detail.
4. What is Ziegler – Natta catalyst? How Ziegler-Natta catalyzed involved in step polymerization?
5. Explain ring opening polymerization mechanism.
6. Write the preparations and properties of block and graft copolymers.

UNIT II

1. Explain in detail about the polymerization techniques and give its advantages.
2. Write a note on number average and weight average molecular weight of a polymers.
3. What is glass transition temperature? Explain the determination of T_g and factors influencing it.
4. Discuss the polymer crystallization method.
5. Explain effect of crystallinity on the properties of polymers.

UNIT III

1. Write a note on calendaring and rotational casting with a neat diagram.
2. Explain in detail about compression moulding and injection moulding of plastics.
3. Explain the manufacturing and applications of PVC, PS, Polyurethane and Teflon.

UNIT IV

1. Give a detailed account of preparation and properties of synthetic fibers.
2. Explain the following synthetic rubber preparation, SBR, butyl rubber, neoprene, silicone rubber, polysulphide.
3. Discuss the preparation and properties and application of conducting polymers.

UNIT V

1. Discuss how the polymer are degraded by various factors.
2. Explain various additives used in polymers.
3. Write a note on bio degradable polymers and their applications.

M.Sc Chemistry III Semester

QUESTION BANK

INORGANIC CHEMISTRY-III

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PART-A

UNIT-I

1. Define Effect of coordination on ligand bands
2. Write any two properties of Urea complexes
3. What is sulphate and perchlorate complexes?

UNIT-II

1. What is Classification of Transitions ? Give an examples.
2. What is Selection Rules?
3. Differentiate between Orgel and Tanabe
4. Define Charge Transfer Spectra.

UNIT-III

1. What is NMR?
2. What is Mossbauer spectra?
3. Define NMR shift reagents.
4. What is Mossbauer of Fe and Sn systems?

UNIT-IV

1. What is ESR introduction
2. What is McConnell's equation?
3. Define Koopman's theorem.

UNIT-V

1. What is Bravais Lattices?

2.What is Basic Principles of diffraction?

3. Define SEM and TEM.

4.What is Optical Microscopy?

PART-B

UNIT-I

1.Discuss the types, properties and application of Urea complexes with examples.

2.Write a note on Raman spectroscopy of metal complexes.

3.Explain differentiation of geometric isomers

UNIT-II

1.Explain Classification of Transitions.

2.Explain Selection Rules

3.Discuss Spectra of Octahedral complexes.

4.Write a note on Charge Transfer Spectra.

UNIT-III

1.Discuss Mossbauer spectra.

2.Write a note on NMR spectra of ^{31}P .

3.Explain NQR-Nitrosyl compounds.

UNIT-IV

1.Discuss Zeeman equation.

2.Explain the Kramer's theorem.

3.Discuss Chemical shift and Correlation with electronic charges.

UNIT-V

1.Explain the Basic Principles of diffraction.

2.Discuss Single crystal diffraction in crystal structure analysis.

3.Explain the X-ray Fluorescence Spectroscopy

M.Sc Chemistry III Semester

QUESTION BANK

ORGANIC CHEMISTRY III

PART A

UNIT I : PHYSICAL METHODS OF STRUCTURE DETERMINATION

1. Write the principle of ultraviolet spectroscopy.
2. Give two applications of mass spectrometry.
3. What is meant by cotton effect?
4. State axial haloketone rule.
5. Define optical rotator dispersion.

UNIT II: NMR SPECTROSCOPY

1. Give the principle of NMR.
2. What is spin-spin coupling in NMR?
3. Write two applications of FTNMR.
4. Write the uses of ^{13}C resonance spectroscopy.
5. What types of nuclei become NMR active?
6. Define chemical shift.

UNIT III: ORGANIC PHOTOCHEMISTRY AND AROMATICITY

1. What is meant by Aromaticity?
2. Define Huckel's rule.
3. What are Annulene? Give its structure.
4. What is the basis of photochemistry?
5. How photo chemistry is employed in photo reduction and cyclo additions
6. Give the structure of vitamin D.
7. Write two applications of Woodward-Hoffman rules.

UNIT IV: ORBITAL SYMMETRY AND CORRELATION

1. What is a pericyclic reaction?

2. State Woodward Hoffmann rules.
3. What is meant by sigmatropic reactions?
4. What is bivalene? Give its basic structure.
5. What is a fluxional molecule?

UNIT V: HETEROCYCLIC COMPOUNDS , TERPENOIDS AND STEROIDS

1. What are Flavones and isoflavones?
2. What are Carotenoids?
3. Write the structure of cholesterol.
4. Give the structure of testosterone.

PART B

UNIT I: PHYSICAL METHODS OF STRUCTURE DETERMINATION

1. Describe the principles and applications of infrared spectroscopy in the structural determination of organic compounds.
2. Describe how mass spectrophotometer helps in the determination of structure of organic compounds.
3. Write in detail about optical rotatory dispersion and its applications in organic chemistry.
4. Write short notes on
 - a. Cotton effect
 - b. Octant rule
 - c. Axial haloketone rule
5. Describe the applications of Woodward Fieser Rule in the structural determinations.
6. Explain how Woodward-Fieser rules are helpful in predicting λ_{Max} values.
7. Indicate how octant rule is helpful in predicting the sign of cotton effect curve.

UNIT II: : NMR SPECTROSCOPY

1. Write the principle and applications of Nuclear Magnetic resonance.

2. Describe how chemical shifts in NMR helps in the determination of organic compounds.
3. Write briefly on
 - a. Proton chemical shift
 - b. Coupling constant
 - c. Zeeman effect.
4. Discuss FTNMR ^{13}C resonance spectroscopy in detail.
5. State the principle of H NMR spectra and illustrate with examples about its applications.
6. Write short notes on
 1. Spin-spin coupling in NMR spectra
 2. Proton chemical shift in NMR
7. Distinguish between ^1H and ^{13}C NMR spectra with respect to its usefulness in the determination of structure of organic molecules.

UNIT III: ORGANIC PHOTOCHEMISTRY AND AROMATICITY

1. Describe aromaticity of benzenoid and non benzenoid compounds with suitable examples.
2. Write briefly on the application of Huckels rule to aromatic systems with pi electrons.
3. Write a detailed account of photo chemistry of ketones giving examples.
4. Discuss paterno-Buchi reaction and Di-P- methane rearrangement in detail.
5. Write short notes on
 - a. Barton reaction
 - b. Photo Fries reaction
 - c. Photo chemistry of cyclohexadienones.
6. Describe the synthesis of Vitamin-D and write its applications.
7. Illustrate the applications of Huckel's rule and explain the aromaticity of annulenes.
8. What are aromatic, antiaromatic and non aromatic compounds? Give examples.
9. Discuss the photochemistry of Ketones and photocyclo additions with examples.
10. Give a brief account of
 1. Paterno-Buchi reaction

2. Barton reaction
3. Photo Fries reaction

UNIT IV: ORBITAL SYMMETRY AND CORRELATION

1. Describe the classification of pericyclic reaction citing examples.
2. What is meant by orbital symmetry? How it is involved in woodward Hoft man rules.
3. Write the FMO analysis of electro cyclic and sigma tropic reactions.
4. What are $(\pi^{2s} + \pi^{2s}) + (\pi^{4s} + \pi^{2s})$ cycloadditions. Explain with suitable examples?
5. Explain how interconversion of hexatriene to cyclohexadiene can be carried out in detail.
6. What is meant by a fluxional molecule? Explain the structure of bivalence in detail?
7. Write the mechanism of cope and claisen rearrangements.
8. Describe Norrish Types – I and Norrish type II reactions with mechanisms.
9. How pericyclic reactions can be classified? Explain in detail sigmatropic pericyclic reactions suitable example.
10. Write notes on cope rearrangement and claisen rearrangement.
11. Give the meaning of flexional molecule? Explain Electrocyclic and cyclo addition reactions.

UNIT V: HETEROCYCLIC COMPOUNDS , TERPENOIDS AND STEROIDS

1. Define Antho cyanins. Explain in detail how flavones and Isoflavones and different from it.
2. Write the synthesis of carotenoids.
3. Describe reformat sky and witting methods of synthesis of Vitamin A1.
4. Elucidate the structure of cholesterol by chemical degradation method.
5. Discuss the conversion of cholesterol to progesterone.
6. Describe a method to convert cholesterol to testosterone.
7. Describe the synthesis of Vitamin A1.
8. Write briefly on : 1. Flavones 2. Isoflavones 3. Antho cyanius

