Krishnasamy College of Science, Arts & Management for Women, Cuddalore

M.Sc. Chemistry

Organic Chemistry – I (DCH 11)

TWO MARK QUESTIONS

1. Define homomers.
2. Define isomers.
3. What is configuration and conformation?
4. Define chiral and achiral.
5. What is symmetry elements? and its types.
6. Write the plane of symmetry.
7. Write the centre of symmetry.
8. Write the axis of symmetry.
9. Write proper axis of symmetry.
10. Define enantiomers and diastereomers.
11. Write the optical activity and their conditions.
12. What is asymmetric and dissymmetric molecules?
13. Define chiral axis.
14. Define chiral plane.
15. What is atropisomerism? with an example.
16. Write the CIP rule.
17. What is enantiotopic ligand?
18. What is diastereotopic ligand?
19. Define prochiralcentre.
20. What is crams rule? With an example.
21. Write the erythro and thereo compound.
22. Write the E-Z configuration.

Unit – II

2 Mark Questions:

1. What is substitution reaction give an example?
2. Define nucleophiles.
3. What is aliphatic nucleophilic substitution reaction and its types?
4. What is SN^1 reaction?
5. What is SN^2 reaction?
6. What is SN^i reaction?
7. What are the factors influencing aliphatic nucleophilic substitution reaction?
8. Write comparison of SN^1 and SN^2 reaction.
9. Why SN^1 reaction is faster than SN^2 reaction?
10. What is neighbouring group participation?

11. What is conformation analysis?
12. Draw the structure of cis conformation of 1,2 dimethyl cyclohexane
13. Draw the structure of trans conformation of 1,2 dimethyl cyclohexane
14. Which conformation more stable for 1,2 dimethyl cyclohexane?
15. Why trans conformation more stable for 1,2 dimethyl cyclohexane?
16. How many diaxial interaction for cis and trans conformation 1,2 dimethyl cyclohexane?
17. What is guche interaction ?
18. Draw the structure of cis conformation of 1,3dimethyl cyclohexane?
19. Draw the structure of trans conformation of 1,3 dimethyl cyclohexane?
20. Which conformation more stable for 1,3 dimethyl cyclohexane?
21. Why cis conformation more stable for 1,3 dimethyl cyclohexane?
22. How many diaxial interaction for cis and trans conformation 1,2 dimethyl cyclohexane?
23. What is guche interaction ?
24. Draw the structure of cis conformation of 1,4 dimethyl cyclohexane
25. Draw the structure of trans conformation of 1,4 dimethyl cyclohexane
26. Which conformation more stable for 1,4 dimethyl cyclohexane?
27. Why trans conformation more stable for 1,4 dimethyl cyclohexane?
28. How many diaxial interaction for cis and trans conformation 1,4 dimethyl cyclohexane?
29. How many gauche interaction for cis and trans conformation 1,2 dimethyl cyclohexane?
30. How many gauche interaction for cis and trans conformation 1,3 dimethyl cyclohexane?
31. How many gauche interaction for cis and trans conformation 1,4 dimethyl cyclohexane?
32. Why equatorial- equatorial more stable than axial-axial disubsititution?
33. What is decaline?
34. Draw the structure of cis conformation of decaline
35. Draw the structure of trans conformation of decaline
36. Draw the structure of cis conformation of 9- methyl decaline
37. Draw the structure of trans conformation of 9- methyl decaline
38. Why trans decaline more stable than cis decaline?
39. Which conformation more faster reaction for oxidation of cyclohexanol?
40. Why cis conformation more faster reaction for oxidation of cyclohexanol?
41. Which conformation more faster reaction for acylation of cyclohexanol?
42. Why trans conformation more faster reaction for acylation of cyclohexanol?
43. Write reduction reaction of cyclohexanone?
44. Which conformation more faster reaction for reduction of cyclohexanone?
45. Write derivative of cyclohexane carboxylic acid
46. Which conformation more faster reaction for esterification cyclohexane carboxylic acid?
47. Draw optical isomerism structure for 1,2 dimethyl cyclohexane?
48. Draw optical isomerism structure for 1,3 dimethyl cyclohexane?
49. Draw optical isomerism structure for 1,4 dimethyl cyclohexane?
50. How many butane gauche interaction for decaline?

51. Write the Dieckmann condensation reaction.
52. What is claisen condensation give an example?

Unit – V

2 Mark Questions:

1. Define isotope effect.
2. What is substituent effect?
3. What is steric effect give an example?
4. Write the isotope labeling.
5. Write the cross over experiments.
6. Why hammett equation failure?
7. Write the significance of hammett equation.
8. What is partial rate factors?
9. Write the significance of taft equation.

Unit III

1. What is SE^1 reaction?
2. What is SE^2 reaction?
3. What is SE^i reaction?
4. Write stereochemistry of SE^1 reaction
5. Write stereochemistry of SE^2 reaction
6. Write stereochemistry of SE^i reaction
7. Write mechanism of SE^1 reaction
8. Write mechanism of SE^2 reaction
9. Write mechanism of SE^i reaction
10. Explain migration of double bond
11. Explain stability of carbocation
12. 1,3 butadinene react with HBr give stable product and explain ?
13. What is keto-enol interconversion?
14. What is stark-Enamine reaction?
15. Write the application of stark-Enamine reaction
16. Write the acylation of stark-Enamine reaction
17. Write halogenations of aldehyde
18. Write halogenations of ketone
19. What is decarboxylation?
20. Explain decarboxylation of cinnamic acid

Unit IV

1. What is arenium ion?
2. What is orientation?
3. What is ortho para orientation?
4. What is meta orientation?
5. Write ortho para directing group
6. Write meta directing group
7. Explain ortho para directing group activate the benzene reaction
8. Explain meta directing group deactivate the benzene reaction
9. Explain halogens are ortho para directing group but deactivate the benzene reaction
10. Why protonated aniline deactivate the benzene ring?
11. What is Reimer-Tieman reaction?
12. Which reagent used in Reimer-Tieman reaction
13. Write indole react Reimer-Tieman reaction
14. Write the mechanism of Reimer-Tieman reaction
15. Write application of Reimer-Tieman reaction
16. What is Vilsmeier-Haack reaction
17. Write the mechanism of Vilsmeier-Haack reaction
18. What is Gattermann reaction?
19. What is Gattermann-Koch reaction?
20. What is Kolbe reaction?
21. Write the mechanism of Kolbe reaction
22. Write synthesis of tribromobenzene
23. Write synthesis of 2-amino-5-methyl phenol
24. Write synthesis of 3nitro-4-bromobenzoic acid
25. Write synthesis of 3,4-dibromonitrobenzene
26. Write synthesis of 1,3,5-trimethyl benzene
27. What is electrophilic substitution reaction?
28. What is nucleophilic substitution reaction?
29. What is difference between nucleophilic and electrophilic substitution reaction?
30. What is SNAr mechanism?
31. What is benzyne mechanism?
32. Write any two reaction of generation of benzyne?
33. Write the application of benzyne mechanism
34. Explain hybridization of benzyne
35. Explain Ziegler alkylation
36. What is chichibabin reaction
37. Write the mechanism of chichibabin reaction
38. Phenoxide ion more ractive than phenol why?
39. Toluene is less reactive than phenol why?

40. Write the application of chichibabin reaction

Unit - I

1. Explain the term asymmetric and dissymmetric molecule with example.
2. Write a stereochemistry of allenes and spiranes.Write about R &S configuration.
3. Explain the following R&S notation of biphenyls and allenes.
4. Explain the following (i) Fischer projection (ii) Sawhourse &Newmen
5. Explain Optical activity and chirality?
6. Explain classification of chiral molecules as asymmetric and dissymmetric.
7. Explain dissymmetry of allenes, biphenyls, spiro compounds
8. Explain trans-cyclooctene, cyclononene and molecules with helical structures
9. Explain Inter conversion of Sawhorse, Newman and Fischer projections.
10. Explain Erythro and threo nomenclature, E and Z nomenclature
11. Explain Asymmetric synthesis
12. Explain Cram's rule
13. Explain configuration - R, S notation of biphenyls and allenes

Unit – II
14. Write a note on conformation of 9-methyl decalin.(or)
15. Discuss the conformational analysis of cyclohexane.
16. Explain the conformation of 1,3dimethyl cyclohexane.
17. Explain the conformational analysis of disubstituted cyclohexane.
18. Conformational analysis of disubstituted cyclohexane and their stereochemical features geometrica.l
19. Explain Conformational analysis of disubstituted cyclohexane and their stereochemical features optical isomerism
20. Explain Conformation and reactivity of substituted cyclohexanol oxidation.
21. Explain Conformation and reactivity of substituted cyclohexanol Conformation and reactivity of substituted cyclohexanol acylation.
22. Explain cyclohexanone reduction.
23. Explain cyclohexane carboxylic acid derivatives esterificatio.
24. Write cyclohexane carboxylic acid derivatives hydrolysis.
25. Conformation and stereochemistry of cis and trans-decalin .
26. Explain Conformation and stereochemistry of cis and trans-decalin .

Unit – III

27. Explain ester hydrolysis and its mechanism.
28. Explain stark enamine reaction.
29. Describe the mechanism of SN1 and SN2 neucleophilic substitution reaction.
30. Explain the term Keto -enol interconversion.
31. Explain Neighboring group participation the classical theory of Raman spectra?

32. Explain the- structural and solvent effects
33. Explain the substitution in norbornyl and bridgehead systems
34. Explain the substitution at allylic and vinylic carbons
35. Explain ambident nucleophiles .
36. Explain substitution at carbon doubly bonded to oxygen .
37. Explain Dieckmann condensation
38. Explain substitution at carbon doubly bonded to nitrogen .
39. Explain alkylation and acylation of amines
40. Explain halogen exchange
41. Explain , Von-Braun reaction
42. Explain, alkylation and acylation of active methylene carbon compounds
43. Explain hydrolysis of esters
44. Explain Claisen and Dieckmann condensation
45. Explain SE1, SE2 and SEi mechanism, double bond shift - Reactivity.
46. Explain keto-enol interconversion
47. Explain Stark- Enamine reaction,
48. Explain halogenation of ketones and decarboxylation of aliphatic acids.
49. Explain halogenation of aldehydes decarboxylation of aliphatic acids.

Unit – IV
50. Discuss the following : (i) Pyrolytic elimination (ii) Dehydration reaction
51. Discuss the mechanism of which following E1CB pathway. Illustrate with example.
52. Explain with suitable example the E1 and E2 elimination mechanism.
53. Explain E1, E2 and E1cB spectrum .
54. Explain Orientation of the double bond - Hoffman and Saytzeff rules .
55. Explain Orientation of the double bond - Hoffman and Saytzeff rules .
56. Explain Typical elimination reactions- dehydration.
57. Explain Typical elimination reactions- dehydration.
58. Explain Typical elimination reactions- dehydrohalogenation .
59. Explain Stereochemistry of E2 eliminations in cyclohexane systems .
60. Explain Mechanism of pyrolytic eliminations.
61. Explain Chugaev eliminations .
62. Explain Cope eliminations .

Unit – V
63. Explain the following (i)chichibabin reaction(ii)Synthesis of syn-tribromobenzene.
64. Explain the Kolbe and Gatterman reaction.
65. Explain the Reimer- Tiemen reaction with example
66. Discuss the orientaion and reactivity of the substitution reaction.
67. Explain arenium ion mechanism.
68. Explain Reimer - Tieman reaction.
69. Explain Vilsmeier - Haack .
70. Explain, Gattermann .

71. Explain Gattermann - Koch reaction.
72. Explain Kolbe reaction .
73. Explain Synthesis of di and tri substituted benzene .
74. Explain Benzyne mechanisms .
75. Explain Nucleophilic substitution involving diazonium ions .
76. Explain Ziegler alkylation .
77. ExplainChichibabin reaction.

KRISHNASAMY COLLEGE OF SCIENCE, ARTS AND MANAGEMENT FOR WOMEN-CUDDALORE.

QUESTION BANK

Sub: Inorganic chemistry-I (DCH 12)

UNIT-1

1. Define Polyacids
2. Define Isopolyacids
3. Define Heteropolyacids
4. What are silicates?
5. What are the different types of silicates?
6. Write the structure of SiO_4^{4-}
7. Write any two examples of ortho silicates.
8. What are pyrosilicates?
9. Write any two examples of chain silicates.
10. What are Zeolites?
11. What are molecular sieves?
12. What are silicones?
13. Define inorganic polymer
14. Write the general formula of phosphazine.
15. Write the structure of S_4N_4 and S_2N_2.
16. Write the structure of polythiazyl.
17. Define dimolybdates.
18. What are the different types of isopoly tungsates?
19. Write the general formula of heteropolyacids.
20. Write any two examples of isopoly acids.

UNIT-2

1. Define Boron hydrides
2. Define hydroboration
3. Define Wades rule
4. Write the STYX code for diborane.
5. Write the structure of Tetraborane?
6. Define carboranes
7. What are the different types of carboranes?
8. Define Mingo's rule.
9. Define Arachno boranes
10. What are metal clusters?
11. Give examples of homonuclear bare ionic post-transition metal clusters.
12. What are Cubane clusters?

13. Give examples of trinuclear metal clusters.
14. What are Conjucto Boranes?
15. Give examples of Zintl clusters .

UNIT-3

1. Define Thermodynamic Stability.
2. Define Kinetic Stability.
3. Define Stability constant.
4. Define instability constant.
5. Define Stepwise stability constants.
6. Define overall stability constant.
7. Define Statistical factor.
8. Define Steric factor.

UNIT -4

1. What is isomerization?
2. Write the type of stereo isomerization?
3. Write the type of structural isomerization?
4. What is Ionisation isomerism. Give an example.
5. Define Hydrate Isomerism.
6. What is ligand conformation.
7. What is ligand configuration.
8. Write the structure of crown ether.
9. Write the structure of cryptate.
10. What is optical isomerization.

UNIT-5

1. Write the concept of weak field ligand.

2. Write the concept of strong field ligand.

3. Define spin-orbit coupling.

4. Write the nephelauxetic series of cation.

5. Write the nephelauxetic series of anion.

6. What is spin-spin coupling.

7. What is orbit-orbit coupling.

8. Write the term symbols for d ion.

9. Write the type of charge-transfer spectra.

10. Write the rule for orgel diagram.

UNIT-III

1. What is hard acid? Give an example.
2. What is hard base? Give an example.
3. What is soft acid? Give an example.
4. What is soft base? Give an example.
5. What is Borderline base?
6. What is Borderline acid?

Unit -1

Marks **-5**

1. Write a note on phosphazane polymers.

2. Write a note on ISO poly acids with examples.

3. Write are silicates? Explain different types of silicates with structure.

4. Write a note on molecular sieves.

5. Compare the structural features of iso polyacids with that of heteropolyacids.

6. What are isopropyl and heteropolyacids? Give an account of isopoly acids of chromium.

7. Give an account of the preparation properties and structure of trimeric phosphazenes.

8. Describe the chemistry of iso and heteropoly acids of molybdenum.

9. Write notes on molecular sciences.

10. Write a note on poly organophosphazenes.

Marks -10

1. How S4N4 is prepared? What is its reaction with Ag?   Discuss its structure.

2. What are isopoly and heteropoly acids? Discuss the structure of heteropoly acids?

3. Discuss the structure properties and uses of phosphonitrilic compounds.

4. Discuss the structure properties and uses of orthophonitrilic and frame –work silicates?

5. Discuss the structure properties and uses of trimeric phosphazenes.

6. What are isopoly and hetropoly acids? Give an account of isopoly acids of chromium and heteropoly acids ofmolybedenum.

7. Write a brief survey of inorganic polymers?

8. Discuss the structure properties and uses of molecular sieves.

Unit -2

1. How are boranes prepared ? How are they classified.

2. Write a note on metallo- carboranes.

3. Discuss the structure of diborane. Mention about the molecular orbitals.

4. Write a short on hydroboration.

5. What are carboranes? How are they classified?

6. Write down the importance of polyhedral boranes.

7. How will you characterise the M-M bond in multiple mutual clusters.

8. Mention any two methods of preparation of diborane. Describe its structures.

9. Describe the preparation and structure of metalllocarboranes.

10. Discuss the structures of trinuclear metal clusters with suitable examples.

11. What are electron deficient molecules? Discuss the structure of diborane.

12. What are Nido carboranes ?Explain its types with examples.

13. Explain closo carboranes ?Explain its types with examples

Marks -10

1. What are electron deficient molecules? Discuss the structure and bonding in tetraborane.

2. Write an account on the formation and structure of different kinds of metallocarboranes.

3. What is hydroboration? How isits used in organic synthesis?

4. Discuss the structure of B_2H_6 and B_4H_{10}?

5. What are metal clusters? Discuss its applidcation in organic synthesis

Unit -3

1. Differentiate between thermodynamics stability and kinetic inertness?

2. What is thermodynamic stability of complexes?Discuss the chelation with respect to stability of complexes.

3. Give pearson's concept and explain the relative stability of complexes on the basis of HASB principle.

4. Explain HSAB approach to the stability complexes.

5. Define thermodynamic stability of complexes.

6. Discuss the spectrophotometric method used to dertermine the stability of a complex.

7. Give an account on the HSAB approach for the stability constant.

8. Discuss the potentiometric method of the determination of stability constants of complexes.

9. What are stepwise and overall formation constants?

10. Distinguish between labil and inert complexes.Derive the relationship between stepwise and overall formation constants.

Marks10

1. Explain the factors which influence of stability of complex.

2. With examples,expain any five factors that are affecting the stability of metal complexes.

3. Define stability constant and instability constant.Derive the relation between stepwise and overall stability constant.

4. How will you dermine the stability constants of complexes by spectrophotometric and potentiometric methods.

5. How will you dermine the stability constants of complexes by spectrophotometric and polarographic   methods.

6. Distinguish between thermal stability and kinetic stability of complexes.

7. Explain the dermination of stability constant of co- ordination complexes by spectrophotometric method.

8. Derive the relationship between step-wise and overall formation constant.

9. Explain HSAB approach and discuss its application.

10. Discuss the various factors that affect the stability of a metal comp

Unit -4
1. Discuss optical isomerism in coordination compounds
2. Write short on :

    (i) Optical rotator dispersion.

    (ii) Circular diachrosim

3. Explain the terms ORD and CD.

4. Write note on crown ethers and cryptates.

5. What are different types of stereoisomerism exhibited by inorganic comples.

6. Write a note on porphyrins.

7. What are corrins ? Explain its structure and applicvations.

8. Explain optical isomerism in complexes with coordination number 4.

9. Write a short on Schiff base ligands.

10. Write note on isomerism arising out of ligand conformation. Give proper example.

11. Discuss the optical isomerism of six coordination complexes.

12. Explain the optical isomerism is rarely observed in square planar complexes.

Marks-10

1. Draw the structure of porphyin molecule indicate the position of the subsituents. Explain how the structure of chlorophyll is related to it.

2. Discuss the applications of circular dichroism and optical rotatory dispersion techniques in the determination of absolute configuration of complexes.

3. Describe optical isomerism in coordination complexes with sutiable examples.

5. Write notes on porphyrins and Schiff bases.

6. Describe the usefulness of ORD and CD in ascertaining the stereoisomerism in complexes.

7. Write note on crown ether ligands.

8. Explain optical isomerism in metal complexes with coordination number 6.

9. Discuss circular dichroism.

10. Give an account of stereo isomerism exhibited by tetrahedral and square planar complexes.

Unit -5

1. Write notes on shiff 's bases acting as ligands.

2. Draw and explain the splitting of d orbitals in tetrahedral and square planar complexes.

3. Describe the factors affecting the crystal field stabilisation energy.

4. what are the postulates of crystal field theory.

5. Give a critical account of the different types of magnetic behaviour of metal complexes.

6. Explain the crystal field splitting pattern of d-orpitals in octahedral complexes.

7. Explain Jahn-Tellar affect with proper example.

8. Charge transfer spectra.

9. Define Nephelauxetic effect.

10. Write noteson spectrochemical series and its uses.

11. Explain the phenomena spin –orpit coupling.

12. Deduce the term symbols for $d^{2\ ion}$.

Marks -10

1. Write notes on spectrochemical series.

2. Give an account on Schiff bases and crypts.

3. What are the postulates of crystal field theory? Explain the formation of an octahedral complex based on crystal field theory.

4. Calculate the CFSE of high spin and low spin d^6 and d^4 systems in octahedral geometry.

5. What are macrocyclic ligands? Explain how schiff's bases and crypts act as macrocyclic ligands.

6. Write note on ligand field stabilization energy. Calculate the LFSM for d^4 and d^6 octahedral complexes.

7. Write note on chemistry of vitamin B_{12}&Hemoglobin.

8. Explain Jahn –Teller distortion with an example.

9. Spectral properties of coordination complexes.

10. What are the difference between orgel diagram and Tanabe- Sugano diagram.

KRISHNASAMY COLLEGE OF SCIENCE, ARTS & MANAGEMENT FOR WOMEN
DEPARTMENT OF CHEMISTRY
Subject : Physical Chemistry – I(MCH13)

Two marks: UNIT(I-V)

1. Define partial molar properties?
2. Define chemical potential?
3. Define partial molar heat capacity?
4. Define partial molar volume?
5. Define partial molar entropy?
6. Define partial molar enthalpy?
7. Define partial molar free energy?
8. Write Gibbs – Duhem equation?
9. Define fugacity?
10. Define activity?
11. Define activity coefficient?
12. What is the effect of temperature on fugacity?
13. What is the effect of pressure on fugacity?
14. What is the effect of temperature on chemical potential?
15. What is the effect of pressure on chemical potential?
16. Define phase rule?
17. Define reduced phase rule?
18. Define phase with examples?
19. Define component with examples?
20. Define number of degrees of freedom?
21. Define eutectic temperature?
22. Define eutectic composition?
23. Define triple point?
24. Define mono variant system?
25. Define congruent melting point?
26. Define incongruent melting point?
27. What are peritectic reactions?
28. What is one pair of partially miscible liquids?
29. What is two pair of partially miscible liquids?
30. Define surfactants?
31. Classify the surfactants?
32. Define cationic surfactants with examples?
33. Define anionic surfactants with examples?
34. Define non – ionic surfactants?
35. Define micelles?
36. What is CMC?
37. What are the factors affecting CMC?
38. What is reverse micelles?

39. What is micro emulsion?
40. Define emulsion?
41. Write about ARRT.
42. Write ARRT equation and explain the terms.
43. Define potential energy surface.
44. Write the Eyring equation.
45. What is Activated Complex
46. Write the limitations in ARRT.
47. Write the significance of enthalpy of activation.
48. Write the significance of entropy of activation.
49. Write the significance of free energy of activation.
50. Define Kinetic isotopic effect.
51. Write the Hammett and Taft equation.
52. What are the effects of reactions in solutions?
53. What is LEFT.
54. Calculate the ionic strength of 0.1M sodium chloride solution.
55. What is electrostriction?
56. What is meant by activated complex?
57. Define the term Dielecric constan.
58. Write about stability of colloids.
59. What is Protective colloid?
60. Define the term Gold number.
61. Define Streaming potential.
62. Write about Electro –osmosi s process
63. Write about Donnan membrane equilibrium.
64. Give examples for the acid-base catalyzed reactions.
65. Write the Michaelies-Menton Equation.
66. Write the effects of enzyme catalyzed reactions.
67. Define Competitive inhibition.
68. Write the difference between competitive and uncompetitive inhibition.
69. What is meant by turn over number?
70. Give the examples for enzyme catalyzed reaction.

Unit-1

Mark -5

1. Write a note on partial molar free energy.
2. Write a note on partial molar free volume. .
3. Explain dermination of these quantities.
4. Write a note on fugacity.
5. Compare the variation of fugacity with T& P.
6. Give an account of and activity coefficient..

Mark -10
1. Explain the determination of activity coefficient and emf method
2. Explain dermination of standard free enrgy.
3. Explain the fugacity by graphical method.
4. Discuss Variation of chemical potential with temperature and pressure.
5. Discuss about determination of fugacity by graphical method

Unit -2
Mark -5

1. Write a note on two component system.
2. Write a note on congruent system.
3. Explain incongruent system.
4. Write a note on sodium chloride- water.
5. Explain the phenol- aniline
6. Explain water –Ethyl alcohol – succinic nitrile?

Mark -10
1. Explain three component systems.
2. Explain solid –Liquid equilibria.
3 .Explain hydrate formation (sodium-chloride-sodium sulphate- water).
4 .Explain the two pairs of partially miscible liquids.
5. Explain one pair of partially miscible liquids (acetic acid - chloroform - water and alcohol - benzene - water).

Unit -3
Mark -5

1. Discuss the critical micelle concentration.
2 .Discuss the factors affecting cmc of surfactants.
3. Discuss the electro kinetic phenomena.
4. Explain micro emulsion &reverse micelles.
5. Derive the zeta potential.
6. Explain the electro osmosis.
7. Explain the protective colloids.

Mark -10

1.Write note on .
        1.Gold number
        2.Sedimentation potential
2.Explain streaming potential and Donnan membrane equilibrium.
3.Explain surfactants micellization.
4. Discuss about the Structure and stability of colloids   .

Unit -4
Mark -5
1. Explain ARRT theory.
2. Derive Eyring eqation.
3. Calculate the G, H, S of activation.
4. Explain kinetic eqation.
5. Explain Hammett eqation.

Mark -10

1. Discuss about the Tafft equation.
2. Explain ionic strength on reaction in solution.
3. Explain dielerctric constant on rection in solution.
4. Explain pressu8re on reaction in solution.

Unit -5
Mark -5

1. Explain mechanism of acid base catalysed reaction.
2. Explain Bronsted catalysis law.
3. Explain enzyme catalyst mechanism.

Mark -10
1. Derive Michaelis –Menten equation.
2. Discuss effect of substrate concentration,ph and T on enzyme catalyst reaction.
3. Explain competitive inhibition.

KRISHNASAMY COLLEGE OF SCIENCE, ARTS AND MANAGEMENT FOR WOMEN
DEPARTMENT OF CHEMISTRY
SUB: ADVANCED POLYMER CHEMISTRY (Elective) (DECH 14A)

PART-A (2 marks)

Unit-I

1. Define the term: Polymer.
2. Define a monomer.
3. Write the preparation of nylon-66.
4. What is meant by degree of polymerization?
5. Define Tactility.
6. Define dead polymer.
7. Define coupling.
8. What are the advantages of emulsion polymerization?
9. What are the advantages of solution polymerization?
10. Write the drawbacks of solution polymerization.
11. What are the advantages of bulk polymerization?
12. Write the drawbacks of bulk polymerization.
13. What are the advantages of suspension polymerization?
14. Write the drawbacks of suspension polymerization.
15. Listout the three mechanism of addition polymerization.
16. What is meant by initiators?
17. Write the examples for the initiators.
18. What is meant by inhibitors?
19. What is meant by retarders?
20. What is glass transition temperature?
21. What is crystallinity?
22. What is Teflon? How is it prepared?
23. Write any four importance of polyurethane.
24. What are the main uses of **PE**?
25. Write the preparation of **PU.**
26. Write the preparation of **PVC**.
27. Write the uses of PVC.
28. Draw the structure of Starch.
29. Draw the structure of cellulose.
30. What are the main uses of starch?
31. Write the importance of cellulose.
32. What is meant by biopolymers?
33. What are the types of bio polymers?

34. What are the applications of biopolymers?
35. Write any four applications of polymers in the medical field.
36. What is meant by biodegradable polymers?
37. Write the uses of biodegradable polymers.
38. What is a fire safe polymer?
39. What is meant by conducting polymers?
40. Listout the application of conducting polymers.

PART-B (5 Marks)

1. Discuss functionality and chemical bonding in polymers.
2. Differentiate between homopolymer and copolymer.
3. What is meant by copolymer? How it is classified?
4. Differentiate between thermoplastic and thermosetting polymers.
5. Write notes on elastomers.
6. What are resins? How are they prepared? Give their uses.
7. Differentiate between addition and condensation polymerization.
8. Write notes on linear and branched polymers.
9. What are fibers? How are they prepared? Mention their applications.
10. Explain coordination polymerisation.
11. Discuss the mechanism of anionic polymerization.
12. Discuss the mechanism of radical polymerization.
13. Explain kinetic chain length and degree of polymerization with examples.
14. Discuss the polymerization of propylene using Ziegler-Natta Catalyst.
15. What are the initiators? Describe its role in polymerization reactions.
16. Explain the role of retarders in polymerization reactions.
17. Discuss thermo gravimetric analysis (TGA).
18. Explain osmometry method to determine the molecular weight of polymers.
19. Discuss the principle and application of DSC.
20. Discuss the factors affecting glass transition temperature.
21. Explain gel permeation chromatography method.
22. Explain the characterization of polymer by using X-ray diffraction.
23. Describe the preparation and application of nafion derivatives.
24. Explain the structure and application of starch derivatives.
25. Give an account on Chitosan derivatives.
26. Explain Ion-exchange resin and its application.
27. Explain the structure and application of cellulose derivatives.
28. Discuss IPN polymers with examples.
29. Explain biodegradable Polymers with examples.
30. Explain polymer blend with examples.

31. Write a note on high temperature polymers.
32. Explain electroluminescent polymers with examples.
33. Explain polymer nanocomposites with examples.
34. Write a note on fire retardant process.
35. Write a note on poly electrolytes.

PART-C (10 Marks)

1. Explain bulk and suspension polymerization techniques.
2. Explain solution and emulsion polymerization techniques.
3. Differentiate linear, branched and cross linked polymers. Illustrate with examples.
4. Discuss the kinetics and mechanism of copolymerization.
5. Discuss the kinetics and mechanism of cationic polymerisation.
6. Discuss the kinetics and mechanism of anionic polymerization.
7. Discuss the kinetics and mechanism of radical polymerization
8. Discuss the mechanical and thermal properties of polymers.
9. Explain viscosity method to determine the molecular weight of polymers.
10. Describe ultra-centrifuge method for the determination of molecular weight.
11. Explain the preparation and application of (a) **PVC**, (b) **PE**
12. Explain the preparation and application of (a) **PU**, (b) **TEFLON**
13. What are nature polymers? Describe the application and structure of starch and chitosan derivatives.
14. Explain biopolymers with examples.
15. Explain the preparation and application of conducting Polymers with examples.
16. Discuss the role of biomedical polymers in medical field.

*******ALL THE BEST******

KRISHNASAMY COLLEGE OF SCIENCE, ARTS & MANAGEMENT FOR WOMEN, CUDDALORE - 607 109

Department of Computer Science

INTRODUCTION TO COMPUTER APPLICATIONS(NME- I)

Two Mark Questions:

1. Define computer.

2. Define data.

3. Define information.

4. Define data processing.

5. List out the generation of computer.

6. Define personal computer.

7. Define error detecting code.

8. What is meant by memory?

9. Define RAM.

10. Define ROM.

11. Define secondary memory.

12. Define CPU.

13. Define CDROM.

14. Define network.

15. List some output devices.

16. Write the types of networks.

17. Define LAN.

18. Define WAN.

19. What is meant by flat panel display?

20. Define software.

21. Define database.

22. Define operating system.

23. Define WWW.

24. Define E-mail.

25. Define web browser.

26. write the different parts of excel window.

27. How many rows and columns are in excel spreadsheet.

28. Specify any four types of charts in excel?

29. How will you save a file in MS Excel?

30. What is a worksheet?

31. Write any two mathematical functions in excel.

32. How to apply international currency style using MS Excel?

33. How would you start ms excel?

34. How do you insert the new columns in MS Excel?

35.Write the different part of word window.

36. How will you save a file in MS -word?

37. What is mail merge?

38. What is the command for insert clip art?

39. What is auto correct options.

40. How can we numbering the list in MS-word?

41. What is windows?

42. Define icon

43. What is GUI?

44. How to create a new folder in windows.

45. How to rename a folder in windows.

46. How to copy a folder in windows.

47. Define file management.

48. Define files and folders.

49. What is windows explorer?

50. Define operating system.

51. Define multitasking.

52. Define multithreading.

53. Define desktop operating system.

54. List out any two difference between windows and linux.

55. Define disk operating system.

56. What are the types of DOS?

57. Define windows.

58. List out any four internal commands in DOS.

59. List out any four external commands in DOS.

60. What are the features of windows 8?

Five Mark Questions:

1. Explain in detail about the desktop computer.

2. Explain the categories of computer.

3. Explain about input units.

4. Explain about the personal computer.

5. Explain about characteristics of computer.

6. Explain about primary and secondary memory.

7. Explain about the video display devices.

8. Explain about the specification of CPU.

9. Write the application of LAN.

10. Write short note on future of internet technology.

11. Explain about the structure of database.

12. Explain about the data organization.

13. Write the characteristics of database management system.

14. Explain the history WWW.

15. Explain the history of internet.

16. Discuss about Web Browsers and its categories.

17. List out and explain the features of internet explorer.

18. Explain about the Browser.

19. How to search in the internet?

20. Write the uses of E- mail.

21. Write short notes on control panel.

22. Explain structure of windows.

23. Discuss about elements of windows in detail.

24. Explain the importance of file management.

25. How will you create,copy,move and delete a folder?Explain.

26. Discuss internet explorer security.

27. Explain manipulating windows.

28. Discuss about evolution of operating systems.

29. Explain the functions of operating system.

30. Explain the classification of operating system.

31. Discuss the examples of operating system.

32. Explain about disk operating system.

33. Difference between windows and DOS.

34. Difference between linux and windows.

35. Discuss windows families.

36. Explain the features of windows7.

Ten Mark Questions:

1. Discuss about generation of computer.

2. Write about the classification of computer.

3. Explain about the memory cell

4. Detailed about the structure of CPU.

5. Explain about the types of networks.

6. Detailed about output devices.

7. Discuss about Programming Language and its types.

8. Explain about the operating System.

9. How to create an E- mail ID? Explain with example.

10. What is meant by Web browsers? Explain.

11.What are the various types of charts that are available in MS-excel?explain.

12.What are the steps for copying and pasting formula in MS excel.

13.Explain about the creation of charts in MS excel.

14.Explain how to print excel document with its options.

15.Explain the procedure to create charts in excel

16.Craete a excel worksheet containing S.No. product code, product name,price of the product,revenue through the product.fill in the necessary information and sort the data revenue wise.

17.Describe how would you insert a chart in the worksheet.

18.Explain the functions in excel.

19.Explain the mail merge in detail with an example.

20.Explain the method of creating a new document in word.

21.Write a short note on find and replace facility.

22 Discuss the procedure to use bullets and numbering.

23. Write the steps in design your bio- data using with MS-word.

24.Explain how to print word document with its options.

25.Explain how to inserting picture in to your document.

26.Discuss how to creating a template in detail.

27.Explain the features of MS- word.

28.Explain the various components of MS-word document.

29.Explain about features of windows XP

30.Discuss about windows explorer.

KRISHNASAMY COLLEGE OF SCIENCE, ARTS & MANAGEMENT FOR WOMEN
SUB: ORGANIC CHEMISTRY III (DCH 31)

UNIT-I

Section-A
2 Mark Questions:
1. What is chromophore?
2. What is auxochrome?
3. Write the types of electronic transition
4. What is π-π* transition ?give example
5. What is n-π* transition ?give example
6. What is σ-σ* transition ?give example
7. What is n-σ* transition ?give example
8. What is λ max value?
9. What is ξ max value?
10. Write Woodward fisher rule
11. Draw the structure of home & hetero annular
12. What is red shift?
13. What is blue shift?
14. Write Woodward fisher rule of unsaturated carbonyl compound
15. Write the application of Woodward fisher rule
16. What are the factors influencing the position and intensity of absorption bands?
17. Calculate λ max value 1,3 butadiene
18. Calculate λ max value any one α,β unsaturated carbonyl compound
19. Calculate ξ max value vitamin A1
20. Calculate λ max value any one homoannular and heteroannular compound

Section-B
5 Mark Questions:
1. Explain chromophore.
2. Explain auxochromes.
3. Write the types of electronic transition.
4. Explain absorption spectra of polyenes.
5. Write Wood-ward fieser rules for dienes compound.
6. Write Wood-ward fieser rules for unsaturated carbonyl compound.
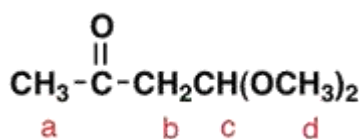
Section-C
10 Mark Questions:
1. Explain factors influencing the positions and intensity of absorption bands.
2. Write Wood-ward fieser rules for dienes give five example and calculated the λmax value.
3. Write Wood-ward fieser rules for polyenes give five example and calculated the λmax value
4. Write Wood-ward fieser rules for unsaturated carbonyl compound give five example and
5. calculated the λmax value.
6. Write notes on chromophore & auxochrome.

UNIT-II

Section-A

2 Mark Questions:

1. Write nuclear spin equation
2. How will you calculate magnetic value?
3. Write spin quantum number based on atomic number and mass number
4. What is chemical shift?
5. What are factor affecting chemical shift?
6. Why TMS standard reference material for NMR spectrum?
7. Write molecular formula for TMS
8. What is shielding ?
9. What is deshielding?
10. What is coupling constant?
11. What are factor affecting coupling constant?
12. What is germinal coupling?
13. What is viccinal coupling?
14. What are solvent used sample preparation of NMR spectrum?
15. What is FT-NMR?
16. Draw the NMR spectrum of acetaldehyde
17. Draw the NMR spectrum of chloroethane
18. What is chemical exchange?
19. What is chemical shift ^{13} C NMR?
20. What are factor affecting ^{13} C NMR chemical shift?
21. What is off resonance?
22. What is decopling?
23. What is double resonance?
24. What is nuclear overhouse effect?
25. Write ^{1}H NMR signal for propane
26. Write ^{1}H NMR signal for acetone
27. Write ^{1}H NMR signal for acetaldehde
28. What is AB system? Give example
29. What is AX system? Give example
30. Write the comparison of ^{13} C NMR & ^{1}H NMR spectrum
31. How many signals does the aldehyde $(CH_3)_3CCH_2CHO$ have in ^{1}H NMR and ^{13}C NMR spectra?
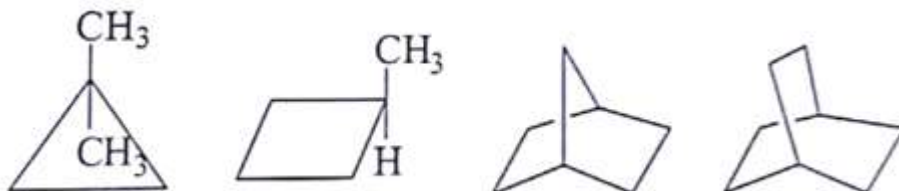32. Which of hydrogens a-d in the following molecule gives a triplet signal in a normal ^{1}H NMR spectrum?

33. The 1_H NMR spectrum of $CH_3OCHCICH_2Cl$ will exhibit _____

34. What will be the strength of coupling between geminal protons in the following molecules?
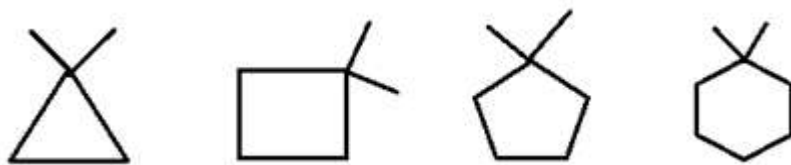
35. What are the number of signals in ^{1}H NMR in the given molecules?

Section-B
5 Mark Questions:
1. Write notes on nucler-spin magnetic moment of a nucleus.
2. Explain basic principles of NMR.
3. Explain CW NMR experiments.
4. Explain FT NMR instrument and application.
5. Explain chemical shift ^{1}H NMR.
6. Explain vicinal coupling.
7. Explain Geminal coupling.
8. Explain Coupling constant.
9. Explain ^{1}H NMR ethanylchloride compound.
10. Explain ^{1}H NMR Benzaldehyde compound.
11. Explain AX type system.
12. Explain AB type system.
13. Write notes on nuclear overhouses effect.
14. Explain ^{13}C NMR proton decoupling.
15. Write any three organic molecules ^{13}C NMR.
16. Explain ^{13}C NMR chemical shift.

Section-C

10Mark Questions:

1. Write notes on CW NMR.
2. .Write notes on FT NMR.
3. ^{1}H NMR chemical shift factor affecting.
4. ^{13}C NMR chemical shift factor affecting.
5. Explain AX & AB type system.
6. Explain chemical exchange ^{13}C NMR.

7. Explain off resonance spectroscopy.
8. Explain vicinal and Geminal coupling.
9. Write any five simple organic molecule ^{13}C NMR spectrum studies.
10. Write any five simple organic molecule ^{1}H NMR spectrum studies.

UNIT-III

Section-A
2 Mark Questions:

1. What is the basic principle of mass spectrometry?
2. What is mass spectrometry?
3. What are the the various parts of the mass spectrometer?
4. Specify the classification of IR region of the spectrum.
5. List the various types of detector used in IR spectrometry.
6. What are the application of mass spectrometry?
7. What is a quadrupole?
8. What is double focusing?
9. Write the postulates of mass spectrometry.
10. Define Cotton effect.
11. Define Octant rule.
12. What is even electron rule?
13. Write the nitrogen rule.
14. What is molecular ions?
15. What is isotope Peak?
16. Define Base peak and metastable peak. With an examples.
17. What is parent ion and daughter ion with an example?
18. Define ORD.
19. Define CB &CD.
20. What is axial haloketone rule?
21. Define ortho effect.
22. What is chemical ionization?
23. What is field desorption?
24. What is fast atom bombardment?
25. What is electron ionization?

Section-B
5 Mark Questions:

1. Explain the factors affecting cleavage patterns in mass spectrum.
2. Describe the CRD and its applications.
3. Give the fragmentation pattern of hydrocarbons.
4. Describe the fragmentation pattern of aromatic compounds.
5. Explain the fragmentation pattern of alcohols.
6. Write short notes on axial haloketone rule.
7. Explain the CD & CB.
8. Explain the instrumentation of mass spectrometer.

Section-C

10 Mark Questions:

1. Explain the following.
   (i) Mc Lafferty rearrangement
   (ii) Octant rule
   (iii) Cotton effect
2. Explain the measurement techniques (CI, EI, FD, FAB & SIMS) in the mass spectroscopy.
3. Discuss about the fragmentation patterns of aldehydes and ketones.
4. Describe the general modes of fragmentations in mass spectrum.

UNIT-IV

Section-A
2 Mark Questions:

1. What are photochemical reactions? How do they differ from thermal reactions?
2. Define Fluorescence.
3. Define Phosphorescence.
4. What is Photosensitization?
5. Define IC and ISC.
6. Define quantum yield.
7. Draw the Jablonskii diagram.
8. What are pericyclic reactions?
9. Define Suprafacial and Antrafacial.
10. What is Conrotation & Disrotation processeses?
11. Define HOMO & LUMO
12. Write the Diels –Alder reaction.
13. What is radiation and non-radiation process?
14. What is electrocyclic reaction?
15. What is sigmatropic reaction?
16. What is cycloaddition reaction?

Section-B
5 Mark Questions:

1. Discuss the photochemical excitation and fate excited molecules.
2. Explain photolysis of benzophenone in details.
3. Give the mechanism of Norrish type-I & II reaction of 2-hexanone.
4. Explain mechanism of Paterno-Buchi reaction.
5. Write the correlation diagram s for butadiene to cyclobutene system.
6. Explain the correlation diagram for hexatriene to cyclohexadiene system.
7. Write short notes on fluxional molecules with an examples.
8. Details study in photochemical reaction of ketones.

Section-C

10 Mark Questions:

1. Explain the Jalonskii diagram with in details.
2. Explain the following with suitable examples.
   (i)Di-Π methane rearrangement.
   (ii)Photo cycloaddition reaction.
3. Discuss the correlation diagram for [2+2] and [4+2] cycloaddition reactions.
4. Describe the mechanism of cope and claisen rearrangement.

UNIT-V

Section-A
2 Mark Questions:

1. Draw the structure of imidazole and oxazole structure
2. Write Synthesis of imidazole
3. Write Synthesis of Oxazole
4. Write Robinson Synthesis of Flavone
5. Draw the structure of Cytosine
6. Draw the structure of Uracil
7. Draw the structure of Adenine
8. Draw the structure of Guanine
9. Write Spath Synthesis of Isoflavone
10. Write Synthesis of wittig reagent
11. Write Synthesis of Cytosine
12. Write Synthesis of Uracil
13. Write Synthesis of Adenine
14. Write Synthesis of Guanine
15. Draw the structure of Vitamin A1
16. Write Synthesis of Vitamin A1
17. Draw the structure of Cholestrol
18. Draw the structure of Progesterone
19. Draw the structure of Tesosterone
20. Draw the structure of Estrone
21. Draw the structure of Anthocyanin
22. Draw the structure of Thiazole
23. Write Synthesis of Anthocyanin
24. Write Gabriel Synthesis of Thiazole
25. Write Cook Heilhorn's Synthesis of Thiazole
26. Write acylation of cholesterol
27. Write Cro_3 oxidation of cholesterol
28. How will you conversion of Cholestrol to Progesterone
29. How will you conversion of Cholestrol to Tesosterone
30. How will you conversion of Cholestrol to Estrone.

Section-B

5 Mark Questions:
1. Write classification of terpenes.
2. Explain isoprene rule.
3. Explain structural determination of citral.
4. Explain structural determination of geraniol.
5. Explain structural determination of linalool.
6. Explain structural determination of farnesol.
7. Write synthesis of alpha-pinene.
8. Write synthesis of camphor.
9. Explain structural determination of camphoric acid.
10. Write general isolation of alkaloids.
11. Write isolation of morphine.
12. Write isolation of quinine.
13. Write isolation of reserpine.

Section-C
10 Mark Questions:
1. Explain structural determination of alpha-pinene.
2. Explain structural determination of camphor.
3. Explain structural determination of linalool.
4. Explain structural determination of citral.
5. Explain structural determination of geraniol.
6. Write synthesis and isolation of quinine.
7. Write synthesis and isolation of morphine.
8. Write synthesis and isolation of reserpine.

Krishnasamy College of Science, Arts & Management for Women, Cuddalore

Question Bank

M.Sc. Chemistry

Inorganic Chemistry – II (DCH 32)

2 Mark Questions

1. What is wilkinson's catalyst? How do you prepare?

2. Describe Hydroformylation reaction.

3. What is Zieses salt?

4. Write down the oxidation state of Rhodium in Wilkinson's catalyst.

5. Describe the polymer bound catalyst.

6. Describe the role of Rhodium metal in catalyst process.

7. Describe advantages and disadvantages of oxo process.

8. What are the types of mechanism for electron transfer reaction?

9. Describe the factors which favour outer sphere electron transfer.

10. Define two electron transfer.

11. Differentiate complementary and non-complementary reaction.

12. Write Marcus – Hush equation.

13. Define Precursor and Successor complex.

14. Describe photoisomerization and its types.

15. Write steps involved in photo-oxidation.

16. Describe Acridinium ion as sensitizer.

17. Define Photo Redox reaction.

18. Write three application of metal complexes in solar energy conversion

Five Marks:Unit - I

- ➢ Explain the Structure of solids;
- ➢ Explain Comparison of X-ray and Neutron Diffraction
- ➢ Write a note on structure of pyrovoskite,
- ➢ Write a note on structure of cadmium iodide
- ➢ Explain Structure of nickel arsenide
- ➢ Explain spinels

- Explain antispinels
- Explain the band theory
- Write a note on Semiconductors
- Write a note on superconductors
- Explain the solid state electrolytes
- Explain inorganic phosphors

Unit – II.

- Explain the Nuclear properties
- Explain the Nuclear spin and moments
- Explain origin of nuclear forces
- Explain liquid drop model
- Explain the nuclear shell model
- Explain Orbital electron capture
- Explain nuclear isomerism,
- Explain internal conversio**n**

Unit – III

- Explain the Stellar energy
- Explain the synthesis of elements
- Explain the hydrogen burning
- Explain the carbon burning
- Explain fast breeder reactors
- Write a short note on particle accelerators,
- Explain linear accelerators.
- Explain cyclotron

Unit – IV

- Explain The chemistry of solid state
- Explain   nuclear and non-nuclear applications
- Explain   preparatory methods of Nanotechnology
- Explain sol gel method
- Explain stereochemistry of lanthanides and actinides

.

- o **Unit – V**
- ➤ Explain octahedral complexes of cobalt
- ➤ Explain octahedral complexes of chromium
- ➤ Explain replacement of coordinated water
- ➤ Explain solvolytic (acids and bases) reactions
- ➤ Explain Photo-substitution
- ➤ Explain Photoredox
- ➤ Explain the Photoredox and isomerisation
- ➤ Explain the application of metal complexes

- ➤ **TEN Marks:**
- ➤ **Unit – I**
- ➤ Explain defects in solids
- ➤ Explain non-stoichometeric compounds
- ➤ Explain Electrical properties of solids
- ➤ Explain magnetic properties of solids
- ➤ Explain optical properties of solids
- ➤ Explain Types of magnetic behavior
- ➤ Explain Solid state lasers, inorganic phosphors and ferrites.
  - o **Unit – II**
- ➤ Explain Modes of radioactive decay
- ➤ Write a brief note on Detection and determination of activity
- ➤ Explain about cloud chamber,
- ➤ Explain nuclear emulsion
- ➤ Explain bubble chamber
- ➤ Explain Geiger-Muller, scintillation and Cherenkov counters.
- ➤ Explain compound nucleus theory
- ➤ Explain high energy nuclear, direct nuclear, photonuclear and thermonuclear reactions.
  - o **Unit – III**
- ➤ Explain Radio analytical methods
- ➤ Explain the : Isotope dilution analysis

- ➤ Explain radiometric titrations.
- ➤ Explain radio immuno assay. Neutron activation analysis

Unit – IV

- ➤ Explain lanthanides and actinides
- ➤ Explain oxidation state , spectral, magnetic characteristics of lanthanides and actinides
- ➤ Explain coordination numbers of lanthanides and actinides
- ➤ Explain characterization, application as sensors, biomedical applications, application in optics and electronics

Unit – V

- ➤ Explain Substitution of octahedral complexes of cobalt and chromium
- ➤ Explain replacement of coordinated water
- ➤ Explain, solvolytic (acids and bases) reaction
- ➤ Explain applications in synthesis (platinum and cobalt complexes only).
- ➤ Explain solar energy conversion

Krishnasamy College of Science, Arts & Management for Women, Cuddalore

M.Sc. Chemistry

SUB:Physical Chemistry – III (DCH 33)

Unit – I to V

Two Marks

1) Write a definition of spectroscopy?

2) Enlist different regions of electromagnetic spectrum.

3) What is mean by zero point energy?

4) Define the terms frequency and wavelength.

5) Write down one example of symmetric top and spherical top molecules.

6) Why N2 molecule is inactive to rotational spectroscopy?

7) Give the equations of fundamental absorption and first overtone.

8) Write down the rule of mutual exclusion.

9) What are the Stokes lines and antistokes lines?

10) Write down the Stark effect.

11) Define and explain predissociation.

12) Write down Born-Oppenheimer approximation.

13) Give the equation of Rotational constant and moment of inertia.

14) Write down the applications of microwave spectroscopy.

15) Define the term plane polarized light.

16) Define Electrolytic polarization.

17) What is Overvoltage?

18) Define fuel cells.

19) What is Passivation of metals

20) What is Pourbiax diagram?

21) Write the electrical properties of solids.

22) Write down the different types of fuel cells.

23) What is Evan's diagram?

24) What is corrosion?

25) Write down the different types of corrosion.

26) Define the Electro deposition process.

27) Write the Butler – Volmer equation.

28) List out the classifications of solids.

29) List out the magnetic properties of solids.

30) Define the Hall effect.

31) What are color centers?

32) Write the Optical properties of solids with examples.

33) What is Zeeman effect?

34) What is Spin-spin coupling?

35) Define the Chemical shift.

36) Write the applications of C^{13} NMR spectra.

37) Write the applications of P^{31} NMR spectra.

38) Write the applications of F^{19} NMR spectra

39) Explain solvent effect.

40) Write the examples for AX and AMX type.s

UNIT- 1

Five Marks:

1. Explain the mechanism of electrode reaction?

2. Explain polarization?

3. Write a note on over potential?

4. Explain the significance of electron exchange current density?

5. Explain the mechanism of hydrogen evolution?

6. Explain the mechanism of oxygen evolution?

7. Write a note on corrosion?

8. Write a note on passivation?

9. Explain the symmetry factors – transfer coefficient and its significance?

10. Explain Evans diagram?

Unit – II

11. Write the classification of solids?

12. Explain the imperfections of solids?

13. Explain frenkel defect?

14. Explain schottky defect?

15. Explain the line defect of solids?

16. Explain the plane defect of solids?

17. Explain non – stoichiometry imperfections?

18. Write a note on metal defiency defect?

19. Write a note on metal excess defect?

20. Explain Hall Effect?

21. Explain piezo electricity?

22. Explain Ferro electricity?

23. Explain the thermal properties of solids?

24. Explain the mechanical properties of solids?

25. Explain the magnetic properties of solids?

26. Explain para, di magnetic properties of solids?

27. Explain ferro, ferri and Anti – ferro magnetic properties of solids?

Unit – III

28. Write a short note on pre dissociation

29. Write a short note on factors affecting width of spectral lines.

30. Write a short note on factors affecting intensity of spectral lines.

31. Write in short applications of Raman spectroscopy.

32. Explain I short 'electronic spectra of diatomic molecules'.

33. Write down radiometric titrations.

34. Write down Frank-Condon principle

35. Write down the applications of electronic spectroscopy.

36. Write in short chemical applications of 1H-NMR.

37. Write in short applications of ESR and Mossbauer spectroscopy

38. Write a note on polarization of light and Raman effect

39. Write a note on Vibrational coarse structure.

40. Write a note on Birge- Sponer extrapolation.

41. Write a short note on coarse and fine structure.

42. Write a note on Frank- Condon principle.

43. Give the classification of rigid rotors.

44. Write a note on transitions observed in the rotational spectrum.

45. Define degeneracy and explain it in detail for energy levels J=1 and J=2. 25. Write down the effect of isotopic substitution on the spectrum of carbon monoxide.

46. Discuss the principle of IR spectroscopy in the molecular structure elucidation.

47. Write down the rule of mutual exclusion in Raman spectroscopy.

48. Define and explain predissociation.

49. State Frank-Condon principle.

50. Discuss the general rules governing the number of lines observed in ESR spectroscopy.

51. ketch and explain Fortrat diagram.

25. Describe in brief rotational fine structure of electronic-vibration transitions.

26. Explain quantum theory and classical theory of Raman effect.

27. Write down the rule of mutual exclusion.

28. Explain Stokes and antistokes lines.

29. Define and explain predissociation.

30. State Frank-Condon principle.

31. Write down selection rule for pure rotational Raman activity in linear molecules.

32. Explain factors determining the intensity of spectral lines.

33. Describe in brief rotational fine structure of electronic-vibration transitions.

34. Explain simple harmonic oscillator and anharmonic oscillator and give selection rules.

35. Why is the selection rule for pure rotational Raman spectrum is $\Delta J = \pm 2$ and $\Delta J = \pm 1$ for pure rotational spectroscopy?

36. What is the effect of isotopic substitution on microwave spectra of linear diatomic molecule?

37. Write a note on Born- Oppenheimer approximation.

38. What is Stark effect? Discuss its applications.

39. What is Raman scattering? 22. Describe the quantum theory of Raman effect.

40. Explain predissociation spectra using a suitable diagram..

41. Write a short note on P,Q and R branches observed in IR spectrum of a diatomic molecule.

42. Note down a principle of ESR spectroscopy.

43. Write down a principle of NMR spectroscopy.

44. Write down a principle of Mossbauer spectroscopy.

45. Discuss the general rules governing the number of lines observed in the ESR spectrum.

46. Discuss the principle of IR spectroscopy in the molecular structure elucidation.

47. What is the significance of zero point energy? Obtain an expression for zero point energy of an anharmonic oscillator.

48. Explain quantum theory of Raman effect.

49. Discuss the theory of pure rotational Raman spectra of linear molecule.

50. Sketch the energy levels and the spectrum arising from transition between them.

51. Write a note on vibrational coarse structure.

52. Write a note on rotational fine structure.

53. How is the dissociation energy of a diatomic molecule determined from vibrational coarse structure in its electronic spectrum?

54. What is force constant? What is its significance? Write the units.

55. Why is CH4 Raman active?

38. What is Born-Oppenheimer approximation?

56. Explain the variation of intensities of spectral transitions in vibrational- electronic spectra of diatomic molecule.

57. Classify the following molecules based on moment of inertia.H2O,HCl,C6H6,BF3

58. Define symmetric top and spherical top and give examples of it

59. What is the equation of rotational constant, B?

60. State and explain rule of mutual exclusion and its converse.

61. What are parallel and perpendicular vibrations? Explain with an example.

62. Explain any two factors which affect the width of spectral lines.

63. Explain classical theory of Raman Effect.

64. Explain photoelectron spectroscopy. Why is high vaccum needed for its study?

65. Discuss rotational fine structure of electronic-vibration transition.

66. Explain the term resolving power and signal to noise ratio.

67. Distinguish between harmonic and anharmonic oscillator with respect to energy,selection rule, and zero point energy.

68. Explain the applications of Mossbauer spectroscopy.

69. Sketch and explain the polarisability ellipsoids for CO_2 molecule.

FIVE MARKS

1. Explain the classical theory of Raman spectra?
2. Explain the pure rotational Raman spectra for linear, symmetric and asymmetric Top molecules?
3. Explain the simple harmonic Oscillator?
4. Explain the an - harmonic oscillator?
5. Explain stokes and anti-stokes lines?
6. Write a short note on Overtones?
7. Explain Fermi Resonance?
8. Explain the instrumentation of Raman spectroscopy?
9. Explain the electron transition for carbon di oxide and water?
10. Explain about Born – Oppenheimer approximation?
11. Explain about progression?
12. Explain about Franck – Condon Principle?
13. Explain about rotational spectroscopy of rigid rotator?
14. Explain about Non – rigid rotator?
15. Explain vibrational frequencies?

Unit – IV

16. Explain the principle of resonance spectroscopy?
17. Write a note on spin magnetic field?

18. Explain chemical shift?

19. Explain spin – spin coupling?

20. Explain AX system and give examples?

21. Explain AMX system and give examples?

22. Explain the calculation of coupling constant?

23. Explain the applications of ^{13}C NMR?

24. Explain the applications of ^{3}P NMR?

25. Explain the application of ^{19}F NMR?

Unit – V

26. Derive Maxwell – Boltzmann statistics?

27. Derive Bose – Einstein statistics?

28. Derive Fermi – Dirac statistics?

29. Explain Stirlings approximation?

30. Compare three statistics?

31. Evaluate the Lagrange's undetermined multipliers?

32. Explain the Maxwell law of distribution of molecular speed?

33. Explain the partition function for an ideal gas?

34. Derive translational partition function?

35. Derive vibrational partition function?

36. Derive rotational partition function?

37. Explain the application of Bose – Einstein statistics?

38. Write the applications of Fermi Dirac statistics?

39. Explain the concept electron gas?

Ten Marks:

Unit – I

1. Explain Butler – Volmer equation?
2. Explain Butler – Volmer equation for one step electron transfer reaction?
3. Explain Butler – Volmer equation for multi-step electron transfer reaction?
4. Explain hydrogen and oxygen evolution reaction?
5. Explain fuel cells?
6. Write a note on polarization and over potential?
7. Explain Pourbiax diagram?
8. Write the application of passivation?
9. Explain electro deposition principle and its application?
10. Explain corrosion determination and prevention?

Unit – II

11. Explain point defect of solids?
12. Write a brief note on physical properties of solids?
13. Explain about non – stoichiometry effect?
14. Explain dielectric properties?
15. Explain piezo and Ferro electricity?
16. Explain about electrical properties of solids?
17. Explain line, plane and point defect?
18. Explain stoichiometry and non – stoichiometry defect?
19. Explain thermal and mechanical properties of solids?
20. Explain para,di, ferro, ferri and anti ferro magnetic properties of solids?

Unit – III

21. Explain the vibrational Raman spectra for water and carbon di oxide?
22. Explain the vibrations of polyatomic molecules using IR spectra?
23. Explain the polyatomic molecules under microwave spectroscopy?

24. The fundamental vibrational frequency of HCl is 86.63×10^{12} Hz. Calculate zero point energy and force constant for HCl.

25. If band origins at the midpoint of P1 and R(0),is at 2143.26 cm-1.This,then is fundamental vibration frequency of CO, if anharmonicity is ignored. First overtone is observed at 4260.04 cm-1. Calculate $\tilde{\omega}$ and xe .

26. The average spacing between successive rotating lines of CO2 is 3.826 cm-1.Determine the transition which gives most intense spectral line at 3.

27. The equilibrium vibration frequency of the iodine molecule is 215 cm-1 and the anharmonicity constant xe is 0.003. What is the intensity of the hot band for V=1 to V=2, relative to the fundamental V=0 to V=1, if the temperature is 300K.

28. Show the fluctuations in the dipole moment of carbon dioxide during asymmetric stretching vibrations.

29. Explain various advantages of Fourier transform spectroscopy.

30. Discuss merits and demerits of Raman spectroscopy.

31. Find the value of rotational constant for the molecule 79Br19F if the most intense spectral line at 300K is for the transition J=17 to J=18.

32. The rotational constant for the V=0 state of the molecule is 10cm-1 and V=1 state is 9.5 cm-1 .Estimate the rotational constant in the state V=2.

33. How does IR spectroscopy differ from Raman spectroscopy?

34. Pure rotational Raman spectra of linear molecule exhibit first line at 6B cm -1 but remaining at 4B cm -1.Explain.

35. Obtain the expression for moment of inertia for rigid diatomic molecule.

36. The rotational constant for 79Br19F is 0.35717cm-1. What is the value of J for which the most intense line will be seen at 300K?

37. How is the dissociation energy of a diatomic molecule determined from vibrational coarse structure in its electronic spectrum?

38. Calculate the force constant for HCl molecule, as it shows absorption band at 2890 cm-1 [Given: Atomic weight: Cl =35.5, H=1.008]

39. What is the effect of breakdown of Born-Oppenheimer approximation on P and R branches of the IR spectrum of a diatomic molecule?

40. The first line in the rotational spectrum of 12C 16O molecule is 3.84235cm-1.Find out the bond length of the molecule.

41. The Fundamental vibrational frequency of 1H 35Cl molecule is 86.63×1012Hz.Calculate the zero point energy and force constant of HCl.

42. 19. Explain the factors influencing width and intensity of spectral lines.

43. 20. Explain effect of isotopic substitution on rotational constant B.

44. 21. If band origins at the midpoint of P1 and R(0),is at 2143.26 cm-1.This,then is fundamental vibration frequency of CO, if anharmonicity is ignored. First overtone is observed at 4260.04 cm-1. Calculate $\tilde{\omega}$ and xe.

45. 22. The average spacing between successive rotating lines of CO2 is 3.826 cm-1.Determine the transition which gives most intense spectral line at 300K?

46. 23. Explain the activity of the following molecules with respect to IR and microwave spectrum.H2, HCl, CO2,CH4 &CH3Cl

47. 24. What are symmetric and asymmetric vibrations? Explain with the example of H2O molecule.

Unit – IV

48. Explain Zeeman Effect?

49. Explain the factors affecting chemical shift?

50. Write a brief note on spin – spin coupling and decoupling constant?

51. Explain the instrumentation of Fourier transformation spectroscopy?

52. Explain the application of FT NMR?

53. Write the application of 3 P NMR?

54. Write the application of 13 C & 19 F NMR?

55. Explain AX and AMX system and give example?

56. Write a brief note on coupling constant?

57. Write a brief note on Fourier transformation resonance spectroscopy?

Unit – V

58. Derive and explain Maxwell – Boltzmann statistics?

59. Derive and explain F – D statistics?

60. Derive and Bose – Einstein statistics?

61. Compare B-E, M – B and F- D statistics?

62. Explain and derive translational partition function?

63. Explain and derive rotational partition function?

64. Explain and derive vibrational partition function?

65. Write the applications of M- B statistics?

66. Write the applications of F-D statistics?

KRISHNASAMY COLLEGE OF SCIENCE, ARTS & MANAGEMENT FOWOMEN
QUESTION BANK
SUB: SCIENTIFIC RESEARCH METHODOLOGY(DCH 34A)

UNIT-I

Section-A
2 Mark Questions:

1. What do you mean by research?
2. What are the qualities of a good research?
3. What are the various types of research?
4. Write the Objectives of research.
5. Write the important of research.
6. What is primary sources?
7. What is secondary sources?
8. What is the aims of research?
9. Write the principles of research.
10. What is journals and patents?
11. How to selection of research problems.

Section-B
5 Mark Questions:

1. Explain importance of research process.
2. What are the aims of research methods.
3. Explain the selection of research problem.
4. Explain the survey of scientific process.
5. Write a short note on primary sources of research.
6. Explain the secondary sources of research.
7. Explain primary and secondary source of research journals.
8. What are the objectives of a research work?
9. Explain about patents in research work.
10. Write a short note on online search.

Section –C
10 Mark Questions:

1. How will you select a research problem? Indicate have a research proposal is formulated.
2. Defining research problem & Explain the selection of research problem.
3. Explain briefly about main sources in research work.

UNIT-II

Section-A
2 Mark Questions:

1. Write the principle of solvent extraction.
2. What is sublimation?
3. Define crystallisation.
4. What is extraction? Mention its types.
5. Define distillation.
6. What are the types of distillation?
7. Define Soxhlet extraction.
8. What are process involved in crystallization?
9. Write uses of Sublimation.
10. What is superiority over conventional solvent extraction techniques?
11. Write uses of Soxhlet extraction.
12. What is vacuum sublimation?
13. Define distillation under reduced pressure.
14. What is hazardous materials?
15. Write the acid-base hazardous materials
16. Write the Water sensitive hazardous materials.
17. What is explosive corrosion hazardous materials?
18. What is radioactive hazardous materials?

Section-B
5 Mark Questions:

1. Explain the different methods of vaccum distillation.
2. Write a short note on sublimation.
3. Discuss the chemistry of working with hazardous materials.
4. Explain about soxhlet extraction.
5. Write a short note on crystallisation.
6. Explain about hazardous radioactive elements.
7. Explain the different types of sublimation

Section-C
10 Mark Questions:

1. Write a note on (a) distillation under reduced pressure & (b) crystallisation.
2. Explain about hazardous radioactive elements &acid, bases used in research work.
3. Explain different types of distillation and sublimation.

UNIT –III

Section-A
2 Mark Questions:

1. Define precision.
2. How are errors classified?
3. Define error.
4. What are determinate error? Its types.
5. What are indeterminate error? Its types.
6. Define Accuracy.
7. How to determine accuracy?
8. Write difference between Accuracy and precision.
9. Define Mean deviation.
10. Define standard deviation.
11. Define Confidence limit.
12. Define Significant figures.
13. What are methods for determining precision?
14. Define mean.
15. Calculate the mean: 20.2, 20.8 and 20.02.
16. Calculate the mean: 20.24, 20.64, 20.13 and 20.19.
17. Calculate the mean: 30.26, 30.3, 30.18 and 30.22.
18. Define median.
19. What is reliability? Mention its types.

Section –B
5 Mark Questions:

1. Explain about Precision.
2. Explain about accuracy.
3. Write a short note on reliability.
4. Explain a determinate errors and random errors.
5. Explain about distribution of random errors.
6. Explain a normal distribution curve.

Section-C
10 Mark Questions:

1. Explain briefly (a) precision (b) accuracy.
2. Write a note on errors and their types.

UNIT-IV

Section-A
2 Mark Questions:

1. What is the students test?
2. Define F test.
3. Write the criteria for rejection of an observation.
4. Write the Q test.
5. What is the significant figures?

6. Write the computational rules.
7. Define t test.

Section –B
5 Mark Questions:

1. Write about Statistical treatment of finite samples
2. Explain students test with example.
3. Explain F test.
4. Write a note on criteria for rejection of an observation
5. Explain the Q test with an example.
6. Write the significant figures and computation rules.
7. Explain data plotting.
8. Write a short note on least square analysis.
9. Explain t test.

Section –C
10 Mark Questions:

1. Explain the Q- test and F- test.
2. Write a note on (a) data plotting and (b) least square analysis.
3. Explain briefly the student test.

UNIT- V

Section-A
2 Mark Questions:

1. Write the general format of thesis writing.
2. Write the general format of assignment writing.
3. What are the uses of quotation?
4. What are the uses of footnotes?
5. What is appendices?
6. Write the any four references.
7. How to page format of thesis and assignment?
8. How to tables format of thesis and assignment?
9. Write any two abbreviations and meaning.
10. Write the uses of proofreading.
11. What is footnotes?
12. What is proofreading?

Section –B
5 Mark Questions:

1. Write about Conventions of writing.
2. Explain the general format of thesis and assignment writing.
3. Explain the page and chapter format.
4. What are the use of quotations and footnotes.
5. Explain preparation of tables and figures.
6. Write a note Referencing.
7. Write a short note on appendices.
8. Explain revising editing and evaluating the final product.
9. Explain proof reading.
10. Explain meanings and examples of commonly used abbreviations.

Section-C
10 Mark Questions:

1. Explain proof reading and revising editing.
2. What are the use of quotations and footnotes. explain briefly.
3. Explain briefly format of thesis writing.

KRISHNASAMY COLLEGE OF SCIENCE, ARTS & MANAGEMENT FOWOMEN
QUESTION BANK – PG II
SUB: Programming Using C++ (NME)

PART – A (2 MARKS)

1. Define OOPs.

2. Define Objects.

3. What are the features of Object oriented programming.

4. Define Encapsulation and Data hiding.

5. Define Data Abstraction.

6. Define Data members.

7. Define Member functions.

8. Define Inheritance.

9. Define Polymorphism.

10. List and define the two types of Polymorphism.

11. Define Dynamic Binding.

12. Define Message Passing.

13. List some benefits of OOPS.

14. List out the applications of OOP.

15. What is the return type of main ()?

16. List out the four basic sections in a typical C++ program.

17. Define Token. What are the tokens used in C++?

18. Define identifier. What are the rules to be followed for identifiers?

19. State the use of void in C++.

20. Define an Enumeration data type.

21. Define reference variable. Give its syntax.

22. List out the new operators introduced in c++.

23. What is the use of Scope resolution operator?

24. List out the memory referencing operators.

25. Define Implicit Conversion.

26. What is call by reference?

27. What are inline functions?

28. State the advantages of Default Arguments.

29. Define Function overloading.

30. Define friend function.

31. Write the limitations/ disadvantages of C++

32. Define Constructor.

33.List some of the special characteristics of constructor.

34.Give the various types of constructors.

35. What are the ways in which a constructor can be called?

36. What is meant by dynamic initialization of objects.

37.Define Destructor.

38.List some of the rules for operator overloading.

39.What are the types of type conversions?

40.What are the conditions should a casting operator satisfy?

41.How the objects are initialized dynamically?

42.Define abstact class.

43.Define virtual base class

44.What are types of inheritance?

45.Give the syntax for inheritance.

46.Define single inheritance.

47.Define multi-level inheritance.

48.Define multiple inheritance.

49. What is an abstract class?

50. Define manipulators and also mention the manipulators that are used in C++.

51. What is the need for streams?

52. List some predefined streams.

53. What are the possible types that a file can be defined?

54. What are the two methods available for opening the files?

55. What is global namespace?

56. Write any four operations possible on string objects.

UNIT -1 TO 5 (5 marks)

1. Explain the different types of polymorphism.

2. Explain Multilevel and hybrid Inheritance.

3. Describe Pure Virtual function with an example.

4. Write a C++ program using this pointer.

5. Write a C++ program for calculating the are of rectangle and circle using run time polymorphism (5)

6. Explain the basic concepts of Object oriented programming

7. Explain the use of constant pointers and pointers to constant with an example.

8. State the differences between class and struct and also illustrate with an example.

9. What are the difference between pointers to constants and constant to pointers?

10.   Write a C++ program using inline function. \

11.   Write a C++ program to illustrate the static function

12.   Explain about call by reference and return by reference with program.

13.   Explain Nested classes and local classes with an example

14.   Write a program to evaluate the following function

$$Sin(x) = x - x3\,/3! + x5\,/5! - x7\,/7! + \dots.$$

15. Explain the structure of C++ program

16. Explain in detail about formatted and unformatted console I/O operations.

17. . Write about declaring member function inside and outside a class

18. Explain the copy constructors with an example.

UNIT -1 TO 5 (10 marks)

1. Explain various types of Inheritance.
2. Write a C++ program using dynamic_const.
3. Write a program in C++ to read two strings and perform the following string manipulation function .
4. (A)Find the long string Compare the two strings
   Concatenate them b) Explain in detail about dynamic objects. How are they created
5. Explain the basic concepts of Object oriented programming
6. Explain briefly about function overloading with a suitable example.
7. Explain Nested classes and local classes with an example
8. Write a program to explain the concept of array of objects.
9. Explain explicit Constructors, Parametrized Constructors, and multiple Constructors
   a. with suitable example.
10. How to achieve operator overloading through friend Function?
11. Write a program to add two complex numbers using operator overloading concept
12. Write a C++ program to find the area of various 2D shapes such as square, rectangle, triangle, circle and ellipse using function overloading.

13. Explain about Formattted and Unformatted IO with suitable Example

14. What is manipulator? Difference between manipulators and ios Function?

15. Explain the process of open,read,write and close files?
16. Explain the role of seekg(),seekp(),tellg(),tellp(),function in the process of random access in a binary file .