COLLOIDS

Questions carry two marks

1. What is ultra filtration?
2. Write a brief note on Brownian movement
3. What is Electrodialysis?
4. Define the term Gold Number.
5. What are emulsions?Give the applications of emulsions in lipid chemistry
6. Discuss the preparation of gold sol by Bredig's Arc method
7. Between starch and gelatin which has better protective action and why?
8. What are dispersed phase and dispersion medium?
9. Name the dispersed phase in milk.
10. What is peptisation?
11. What are protective colloids?

Questions carry two marks

1. Explain: (1) Electrophoresis (2) Tyndal effect

2. Mention the applications of colloids
3. Give any two methods of preparation of colloids Write a note on Tyndal effect Describe the experiment to determine the sign of charge on colloidal particles
4. What are emulsifiers? Give two examples for emulsions.
5. What are emulsions and emulsifiers? Give example
6. How do u prepare colloid by (1) Bredig's arc method and (2) Hydrolysis method?
7. What are Gels? Name the different types of gels with suitable examples.
8. Write any two differences between colloids and crystalloids.
9. Distinguish between lyophilic and lyophobic colloids.
10. How do you prepare colloids by (i) Oxidation (ii) Reduction
11. What is coagulation? Explain it with an example.

ENVIRONMENTAL CHEMISTRY

Questions carry two marks

1. Discuss briefly the toxicity and the health risks caused by Arsenic.
2. What is Ozone depletion?
3. Give the importance of ozone layer the in atmosphere.
4. What is meant by B.O.D?
5. What do you mean by Acid rain?
6. Discuss briefly the toxicity and the health risks caused by mercury.
7. What are air pollutants?
8. What is meant by acid rain? How is it caused?
9. What is Minamata disease? What causes it?
10. Why does photochemical smog cause denuding of trees and plants?

11. Mention the hazards caused by pesticides.
12. What are freons? Mention their harmful effluents?
13. Mention the toxicity caused by cadmium
14. What are the ill effects caused due to the release of hydrocarbons into air?
15. What is COD?

Questions carry four marks

1. Discuss the process of sewage treatement.
2. Discuss briefly the toxic effects caused by lead and mercury.
3. Write a note on the depletion of ozone layer and the causes for it.
4. What are the different causes that pollute water?
5. Write a note on treatment of industrial effluents?
6. What is meant by green house effect? Name the gases that can cause green house effect.
7. Write a note on the depletion of ozone layer, its causes and the remedial measure
8. How are radioactive wastes produced? Why do they need special methods of disposal? Describe one method.
9. Describe atleast two harmful consequences of increased amounts of oxides of sulphur in the atmosphere. How can such pollution be prevented?
10. What are the hazards of overuse of pesticides? Describe how biomagnification of pesticides occurs along the food chain?
11. Discuss briefly the treatment of sewage and industrial effluents.
12. Write a note on detoxification of heavy metals
13. Discuss the toxic effects and sources of chromium?
14. Discuss the pollution air by oxides of nitrogen
15. Describe the active sludge process of sewage treatment.

CO-ORDINATION CHEMISTRY

Questions carry two marks

1. What is a ligand? Give an example for a bidentate ligand.
2. What are transition metals? Give two example
3. What do you mean by the terms high spin complexes and low spin complexes.
4. What are multidentate ligands? Give an example.
5. What is geometrical isomerism? Give an example
6. Draw the structure of Cis and Trans forms of the complex $[Cr(NH_3)_4Cl_2]^+$.
7. Write the geometrical isomers of platinum(II) complexes.
8. What is ligand field theory?
9. Write a note on oxidation states of transition metals.
10. Mention the limitations of valence bond theory.
11. Give reasons: tetrahedral complexes do not exhibit geometrical isomerism.

Questions carry four marks:

1. Explain briefly crystal fiel splitting in Octahedral complex.
2. Write a note on crystal field theory.

3. Distinguish between double salt and complex salt.
4. Write the postulates of Werner's theory of co-ordination compounds. Write the geometrical and optical isomers of dichlorobis (ethylene diammine) cobalt(III) ion.
5. What are ligands? Discuss the various types of ligands with suitable example.
6. Give any four postulates of Valence Bond Theory.
7. Explain Crystal field theory of co-ordination compounds.
8. $[CoF_6]^{3-}$ is paramagnetic while $[Co(NH_3)_6]^{3+}$ is diamagnetic in nature. Explain. Discuss the splitting of d-orbitals in (a)Octahedral complex (b) Tetrahedral complex. Using valence bond theory, explain high spin and low spin complexes.
9. What do you understand by the term crystal field splitting energy? With an example, explain crystal field splitting in an octahedral complexes.
10. Discuss the toxic effects and sources of chromium?
11. Discuss the pollution air by oxides of nitrogen
12. Describe the active sludge process of sewage treatment.
13. Discuss the toxic effects and sources of chromium?
14. Discuss the pollution air by oxides of nitrogen
15. Describe the active sludge process of sewage treatment.

BIO-INORGANIC CHEMISTRY

Questions carry two marks:

1. Name the metal ions present in myoglobin and Vitamin B_{12}.
2. What are metalloenzymes? Give an example.
3. Explain the role of magnesium in chlorophyll.
4. Name the metal ion present in haemoglobin and mension its role.

Questions carry four marks:

1. What are metalloproteins? Explain briefly the importance of metal ions in metalloenzymes.
2. Explain briefly the role of iron in haemoglobin and cytochrome.
3. Explain the role of copper in haemoglobin and magnesium in chlorophyll.
4. Name the metal ions complexed in cytochromes. Explain how these metal ions are responsible for the electron carrying and transferring action of cytochromes.
5. Explain the role of molybdenum in nitrogenase activity.
6. How does cobalt assist in the functioning of Vitamin B_{12}.
7. Give an account of the role on metal ions in biological system.
8. Name the metal ions present in the following enzymes.
   (a) Carboxy peptidase
   (b) Alcohol dehydrogenase
   (c) Kinases
   (d) Cobamide

PHOTOCHEMISTRY

Questions carry two marks:

1. State and explain Grothus-Draper law?
2. What is photochemistry?
3. State and explain Stark-Einstein law of photochemical equivalence.
4. Define quantum yield
5. What are primary and secondary processes?
6. What is Einstein energy?
7. What is photcatalysis? Give an example
8. What are singlet and triplet states?

Questions carry four marks:

1. Write a note on chemiluminescence
2. Explain Bioluminescence briefly using suitable illustrations.
3. State the laws of photochemistry.
4. Distinguish between fluorescence and phosphorescence

IDENTIFICATION AND SEPARATION TECHNIQUES

Questions carry two marks:

1. What is TLC?
2. What is chromatography?
3. Give the principle and application of chromatography
4. What is RF?
5. Give two advantages of spectroscopic technique over that of chemical methods used in structural studies.
6. Mention the principle involved in sedimentation? How are hydrogen bonded and non hydrogen bonded alcohols distinguished from one another by IR spectroscopy.
7. What are the types of molecules that may be studied by UV-Vis spectroscopy?
8. What are the chromophoric groups that can be studied by UV-Vis spectroscopy?
9. Name the chromatographic method that can be adopted for the separation of mixture eof volatile materials.
10. Explain the general principle of partition chromatography?
11. Write a note on ultracentrifugation?
12. Explain the principle of GLC?
13. Give the applications of NMR spectroscopy.
14. What is centrifugation?
15. Define sedimentation co-efficient. Name the factor which influences it.
16. Give an account of SDS-PAGE
17. Define:
    (a) Chromophore
    (b) Bathochromic shift
    (c) Chemical shift
    (d) RCF
    (e) Auxochrome
18. What is λ_{max}?

Questions carry four marks:

1. How is TLC technique useful in the identification of the given amino acid?
2. Explain how UV-Vis spectroscopy is used in the identification of common functional groups.
3. Write the principle and application of ultra centrifugation.
4. Explain how the given amino acid is identified by ascending chromatography
5. What is spectroscopy? Mention the advantages of using spectroscopic techniques over chemical methods of structural determination.
6. What is electrophoresis? Explain how this technique is used in the separation of biomolecules.
7. Give the general principle and applications of TLC.
8. Give any four advantages of infrared spectroscopy.
9. What is the effect of IR and UV radiations on an organic compound?
10. What are the substances used as mobile and stationary phases in GLC? Explain how a mixture of volatile materials may be separated by this technique.
11. What is the principle of ultra centrifugation? Explain briefly how a mixture of protein molecules is separated by this method?
12. Explain the mixture of amino acids can be separated by thin layer chromatography?
13. Write a note on application of IR spectroscopy in the identification of functional groups?
14. Discuss the principle and applications of paper chromatography?
15. Write the principle and applications of X-Ray diffraction technique.
16. Discuss the principle and applications of paper chromatography?

STEREOCHEMISTRY

Questions carry two marks:

1. What is resolution?
2. What is chirality?
3. Name the different types of stereoisomerism.
4. Why is mesotartaric acid optically inactive? What is optical activity? .
5. Draw Fischer projection formulae of optically active forms of tartaric acid?
6. What is geometrical isomerism? Give an example.
7. Write the geometrical isomers of 1,2-dibromocyclohexane.
8. Mention the main disadvantages of biochemical method of resolution.
9. Write cis and trans isomers of 1,2-dimethylecyclohexane.
10. How do you prove that maleic acid is the cis isomer and fumaric acid is the trans isomer by chemical method?
11. Define configuration?
12. What is axis of symmetry?

Questions carry four marks:

1. How is a racemic mixture resolved by biochemical method? What are the disadvantages of this method?
2. How is racemic mixture resolved by chemical method?
3. What are enantiomers? Explain how these are named in DL notation

4. Write the structures of any two saturated dicarboxylic acids and explain the effect of heat on these acids.
5. What are enantiomers and diastereomers? Give examples.
6. Explain the biochemical method of resolution of racemic mixture.
7. What is meant by molecular dissymmetry? Draw the structures of R and S Lactic acid to illustrate it.
8. Draw Fischer projection formulae of the stereoisomers of tartaric acid. Indicate the optically inactive form. Why is it so?
9. Give the structures of E and Z isomers of maleic and fumaric acids. How are they distinguished from one another?
10. Define the terms
    (a) Plane of symmetry
11. Centre of symmetry
12. What is optical isomerism? Give the conditions at which a molecule can exhibit optical isomerism.
13. What is racemisation? Illustrate the formation of racemic mixture using lactic acid as an example.
14. Write the D and L configuration for lactic acid and glyceraldehydes.
15. Give an account of naming optical isomers using R and S configuration.
16. Write R and S isomers for (i)Alanine (ii)Butanol (iii)2-bromopentone
17. Write E and Z isomer for (i)2-Bromobutene (ii)1,2-dimethylcyclopropane (iii)1,2-Dichloroethane (iv)1,2-dichloro cyclohexane
18. Write a note on the significance of chirality in the biological world.

CARBOXYLIC ACIDS

Questions carry two marks:

1. What is the effect of heat on malonic acid?
2. What is pK_a? what does the value of pK_a indicate?
3. Write the structure of pyruvic acid and α-ketoglutaric acid.
4. What are keto acids? Write the structure of α-ketoglutaric acid.
5. What is pK_avalue? Give the pK_avalue of acetic acid.
6. What are hydroxyl acids? Give two examples.
7. What is the action of heat on lactic acid?
8. What is the effect of heat on malonic acid?
9. Write the structure of isocitric acid.
10. Formic acid is stronger than acetic acid. Why?
11. With equation, give the method of preparation of lactic acid.
12. What are keto acids? Write the structures of α-ketoglutaric acid and pyruvic acid. Mention two examples for hydroxyl acids. Give their molecular formulae. Monochloroacetic acid is stronger than the acetic acid. Explain.
13. How is lactic acid prepared from pyruvic acid?
14. With equation give the effect of heat on glutaric acid.
15. Arrange the following compounds in their increasing order of their acidity and justify your answer: HCOOH, $ClCH_2COOH$, CH_3COOH.
16. Prove the presence of hydroxyl and carboxyl groups in lactic acid using suitable reaction.
17. How do you convert propionic acid to lactic acid?
18. Aromatic acids are stronger acids than aliphatic acids. Give reason

Questions carry four marks:

1. Describe with example the effect of heat on succinic acid and glutaric acid.
2. Write the structures of any two saturated dicarboxylic acids and explain the effect of heat on these acids.
3. Explain the effect of substituents on the acidity of mono carboxylic acid taking an example.
4. Give the structures of citric acid and isocitric acid. Where do they occur in nature?
5. What happens when lactic acids reacts with
   (i) $KMnO_4$
   (ii) HCN/H_2O
   (iii) H_2-Ni

AMINES

Questions carry two marks:

1. Name two classes of amines. Give an example for each class.
2. Explain why methylamine is more basic than ammonia?
3. Why is aniline less basic than methylamine?
4. Dimethylamine is more basic than methylamine, why?
5. Name two biologically important amines.
6. Compare the basic nature of methylamine and aniline with ammonia. Justify your answer.
7. How are primary, secondary and tertiary amines distinguished by mustard oil method?
8. What is k_b and pk_b? What does it indicate?
9. Explain the types of isomerism exhibited by amines with a suitable example.

Questions carry four marks:

1. How do you distinguish primary, secondary and tertiary amines?
2. Why amines are basic in nature? Explain the effect of substituents on the basicity of amines.
3. How are amines classified? Give two examples for each class.
4. How are primary, secondary and tertiary amines distinguished by Hinsberg test?
5. How do you distinguish primary, secondary and tertiary amines by using nitrous acid

HETEROCYCLIC COMPOUNDS

Questions carry two marks:

1. Describe the aromaticity of pyrrole. Write the structural formulae of imidazole and isoquinoline.
2. Write the structure of thiophene.

3. Pyrrole is activated where as pyridine is deactivated towards electrophilic substitution reaction. Give reasons.
4. How does pyridine react with (i) sodamide (ii) nitrating mixture.
5. Why is pyridine more basic than pyrrole?
6. Explain the aromaticity of furan.
7. Write the resonance structures of (i)pyrrole (ii)pyridine.
8. On the basis of Huckel's rule, account for the aromaticity of thiophene.
9. What are heterocyclic compounds?
10. Write the structures of five membered and six membered heterocyclic compound.
11. Give the occurrence and importance of (i)Imidazole. (ii) Pyrrole. (iii) Thiazole. (iv) Thiophene.
12. How does imidazole react with (i) HCl (ii) KOH (iii) Ni^{2+} (iv) $C_6H_5CH=CHBr$
13. Write the structure of isoalloxazine.

TERPENES

Questions carry two marks:

1. Write the structure and IUPAC of isoprene.
2. Write the structure of menthol.
3. What are sequiterpenes? Give two examples.
4. Write name and structure of the basic ring system present in steroids.
5. Write the structure of testosterone.
6. What is isoprene rule?
7. Give the importance of plastoquinone. Name the basic ring system present in steroids. Write the structure of quinoline.
8. Give the structural formula and biological importance of phytol.
9. What are sesquiterpenes? Give the structure and importance of juvenile harmone.
10. Give the structural formula of santonin. Where does it occur? What is its biological importance?
11. What are terpenes? Give the classification with examples.
12. What are terpenes? Write briefly about their occurrence.
13. What is the IUPAC name of isoprene? Write its structure.

Questions carry four marks:

1. Write the structural formula of menthol and juvenile harmone and give their biological importance.
2. What are terpenes? How are they classified? Give an example for each class.
3. What are steroids? Name a steroid harmone and give its structure.
4. Give the structure of limonene. Where is it found? Give its importance.
5. Write the structural formula and biological importance of: Abscisic acid, Gibberlic acid, Lanosterole, Lycopene, β-carotene.
6. Mention any two biological importance of polyphenols.
7. What are Dilochols? Give their importance.
8. Write the structure of Ubiquinone. Mention its importance.

ALKALOIDS

Questions carry two marks:

1. Mention any two characteristics of alkaloids.
2. Mention any two uses of alkaloids.
3. Give the physiological functions and medicinal uses of LSD.
4. Name a tobacco alkaloid. Write its structure.
5. Give the medicinal uses of atropine.
6. What are alkaloids? Write examples.
7. Write the structure of nicotine.
8. What are phytochemicals?

Questions carry four marks:

1. Give four important general characteristics of alkaloids.
2. What is LSD? Give its structure and physiological action.
3. Give the structure and physiological action of nicotine.
4. List out the uses of phytochemicals.
5. Name any two alkaloids. Mention their uses.

DRUGS

Questions carry two marks:

1. Write the structural formula of pentothal.
2. Give the synthesis of paludrine.
3. Give the use of pentothal.
4. State one use each of pentothal and sulphanilamide.
5. Give the synthesis and uses of paludrine.
6. Name a barbiturate drug. Write its structure.
7. Write the structure of sulpha drug.

Questions carry four marks:

1. What are hypnotics and anaesthetics? Write an example for each type.
2. What are antipyretics and analgesics? Write examples.
3. How is sulphanilamide synthesized? Give its medical use.
4. How are drugs classified? Give one example for each class.
5. Define chemotherapy. How is sulphanilamide synthesized?

ANTIBIOTICS

Questions carry two marks:

1. What are antibiotics? Give an example.
2. What are antibiotics? Name a broad spectrum antibiotic.
3. What are tetracyclines? Give their general formula.

Questions carry four marks:

1. What are antibiotics? Give two examples.
2. Name three antibiotics other than penicillin and write the structural formula of one of them.
3. What is an antibiotic? Explain how penicillins are obtained?
4. What are antibiotics? Write the structure and give the antimicrobial spectrum of action of chloromycetin and chloramphenicol.

PESTICIDES

Questions carry two marks:

1. Write an example each for organochlorines, organophosphorus and carbamate based pesticides.
2. Write the structure of malathion and gammehexane.
3. What are the uses malathion? What are the problems it causes?
4. Mention the hazards caused by pesticides.
5. What are herbicides? Give an example.

Questions carry two marks:

1. What are insecticides? Discuss the disadvantages of insecticides.
2. What are pesticides? How do they help mankind?
3. What are the hazards of overuse of pesticides? Describe how biomagnification of pesticides occurs along the foodchain?
4. Write the structure of DDT. Give its beneficial and harmful effects.
5. Give the structure and use of 2,4-dichlorophenoxyacetic acid? 3M
6. Give the structure and use of any two insecticides. 3M
7. Give the structure and uses of Allethrin.