**M.Sc. (Chemistry) Sem-II**

**Question Bank**

**CHA-4204 General chemistry**

# Section I

## 1. Objectives questions

1. In GLC the stationary phase is……..
2. Peak area in gas chromatogram depends on….
   a) Concentration of sample component b) Retention time
   c) HETP d) Theoretical plates of column
3. Following gas is not used as carrier gas in GC.

   a) Hydrogen b) Nitrogen c) Chlorine d) Helium
4. HETP measures ……..

   a) Peak width b) Retention time
   c) Column Efficiency d) Column temperature
5. Retention volume in gas chromatography is equal to the ……

   a) HETP × Flow rate of carrier gas

   b) HETP × Retention time

   c) Retention time × Flow rate of carrier gas

   d) Retention time × No. of theoretical plates

## 2. Answer in one sentence.

1. Draw Schematic diagram of Gas Chromatograph.
2. Mention the component of Gas Chromatograph.
3. Mention the detector used in Gas Chromatograph.
4. Mention the characteristics of Retention time.
5. Define- GLC & GSC.
6. State the principle of GC.
7. Give Advantages of GC.
8. What is mean by Retention Time?
9. Give the Application of GC.
10. What is the principle of HPLC?
11. Name the component of HPLC unit.

12. Give the Advantages of HPLC.
13. Name the detector used in HPLC.
14. Discuss the comparison between Adsorption & Partition HPLC.
15. Mention the various types of pumps used in HPLC.
16. Give the characteristics of ideal detecter in HPLC.
17. What is the Normal phase Chromatography?
18. Differentiate between gradient & Isocratic elutions in HPLC.
19. What are the metastable ions in MS.
20. Give the Applications of HPLC.
21. Sketch & label the diagram of TOF.
22. Give the advantages of MS.
23. Mention the component of MS.
24. State the principle of MS.
25. What is mean by mass analyzer & enlist the types of mass analyzer.
26. Name the detectors used in MS.
27. What are the principles of Mass analyzer.
28. Mention the ionization method used in MS.
29. Define – Base peak & Molecular ion.
30. What is nitrogen rule?

**3 Write a short note on.**

1. Short note on : ICPMS
2. Short note on : Derivatization in HPLC.
3. Give a brief account of:
   i) Carrier gas in GC
   ii) Column used in GC
4. Short note on: Supercritical fluid chromatography.

**4. Long Answer questions**

1. Enlist the sources of ionization in mass spectrometry & explain Electron impact ionization method.
2. Enlist the mass analyzer. Explain any one of them.
3. Give block diagram of GC. Explain its various components.
4. What are the properties of an ideal detector? Classify different types of HPLC detectors & explain the working of Refractive index detector.
5. With proper schematic labeled diagram describe the components of HPLC instrumentation.
6. What is mean by chromatography? Classify different chromatographic techniques & give suitable explanation.

7. Explain GC- MS technique.
8. Enlist the pressure pump in HPLC. Explain any one of them in detail.
9. Explain the process of photo ionization & thermal ionization in MS.
10. With suitable schematic diagram explain the function of components of GC setup.
11. Distinguish between Normal phase HPLC & Reverse phase HPLC.
12. What is meant by Hyphenated technique? Explain the technique of GC-MS giving suitable examples.
13. State and explain Ion pair chromatography.
14. Explain Bonded phase Chromatography.
15. Explain Adsorption Chromatography.
16. Explain Ion exchange Chromatography.
17. Explain chemical ionization.
18. Explain Tandem Mass Spectrometry.
19. Explain structural types of column packing.
20. Explain Arc & spark Ionization.

## Section –II

**1 Answer in one sentence**.

1) Give the structure of glycogen and starch.
2) What is primary and active transport.
3) Give the structure of chitin and starch.
4) Classify proteins with suitable example.
5) Define: a) Prokaryotic cell b) Eukaryotic cell
6) Define: Protein
7) Explain the functions of protein.
8) Define: Lipid
9) Give the types of fatty acids.
10) Explain the properties of membrane.
11) Classify protein with suitable example.
12) Define: Lysosome.
13) Define: Enzyme inhibition

**2. Short notes**

1) Prokaryotic and Eukaryotic cell
2) Prokaryotic and Eukaryotic cell metabolism
3) Double reciprocal plot.
4) Cell structure.
5) Classification of protein

6) Structure and functions of nucleus and Lysosome.
7) Lineweaver Burk equation.
8) Structure and importance of starch.
9) Manufacture of medicinal compounds by enzymatic reactions.
10) Mitochondrion: power house of cell
11) Enzyme immobilization.
12) Enzyme inhibition
13) Golgi apparatus
14) Write a short note on $K_m$

**3. Short answer question**

1) What do you mean by primary active transport? Explain with example.
2) What are homopolysaccharides? Explain the structure and function of glycogen.
3) Differentiate between active and passive transport of ions.
4) Give therapeutic uses of enzymes.
5) Explain the irreversible inhibition.
6) Explain the Lysosome and Peroxisomes.
7) Explain the alpha- helical structure of protein with examples.
8) Define $K_m$ and explain the effect of substrate concentration on enzyme activity.
9) Define polysaccharides. Classify them and write their importance.
10) Explain structure and functions of plasma membrane.

**4. Long answer question**

1) What is mean by active transport? Explain the $Na^+$-$K^+$ pump.
2) Differentiate between prokaryotic and eukaryotic cell.
3) What is enzyme inhibition? Discuss irreversible inhibition.
4) Derive Michaelis Menten equation.
5) Discuss the scope of biochemistry in pharmaceutical sciences.
6) Discuss different types of inhibition.
7) Give the structure, function and composition of Biomembrane.
8) Describe the structure and functions of Golgy apparatus and mitochondria.
9) What are homopolysaccharides? Explain the structure and functions of glycogen.
10) What are double reciprocal plots? Explain their significance.
11) Discuss reactions of proteins with: a) Ninhydrin b) Formaldehyde
12) How does $p^H$ and temperature effect the enzyme catalyzed reaction.
13) What are the factors affecting enzyme activity? Describe the effect of substrate Concentration on enzyme activity.

14) What are compound lipids? Mention brief classification of secondary structure of proteins.
15) Give a brief account of: a) Amino acid therapy b) Lysosome
16) What are the factors affecting enzyme activity? Describe the effect of temperature on the rate of enzyme reactions.
17) What do you mean by essential and nonessential amino acids?
18) What are ribosomes? Explain Prokaryotic and Eukaryotic ribosome.
19) Write a note on penicillin acylase for the production of 6-APA.
20) Explain the factors affecting enzyme activity.