

M.Sc. Examination, 2019
Semester-IV
Chemistry
Optional Course: CH-1022
(Inorganic Chemistry)

Time: Three Hours

Full Marks: 40

Questions are of value as indicated in the margin.

Answer *any four* questions.

1. What is photo-physical process? Why fluorescence is much faster than phosphorescence? Give a brief note on fluorescence in term of its principle and analytical applications in qualitative detection and quantitative estimation of an analyte. 2+2+6=10
 2. Two electrons of opposite spins may reside in a single orbital or in a set of two degenerate orbitals. Which one is the real ground singlet state and why? H₂ molecule, He atom or Ba atom; each one is in a singlet electronic configuration. But, they are not fluorescence active and why. What is quantum yield and give its importance. 3+4+3=10
 3. Give the Saha equation and discuss its applications. Write a brief note on 'atomizers' in AAS. Briefly discuss about chemical reactions involved in flame in Flame Emission Spectroscopy. 3+3+4=10
 4. Write down the basic differences between solvent extraction and chromatography. Mention the difficulties of solvent extraction. Write down the basic features and the role of stationary phase, mobile phase and stripping agents in chromatography. 2+2+6=10
 5. What do you mean by sample clean up? Why it is so much important in analytical chemistry? Give a brief note on preconcentration process with respect to quantification of an unknown analyte by chromatography. Show that the preconcentration factor cannot achieves an enormous values but it optimized to an optimum value. 2+2+3+3=10
 6. What is inert support? Why silica gel is chosen as an inert support? What silane coupling reagent? How does it used in physical and chemical process in ligand immobilization on silica gel. Why dimethyl dichlorosilane is found to be superior over γ -trimethoxy-aminopropyl silane for ligand immobilization on silica gel. 2+2+(2+2)+2=10
-