"Section - A"

- ☆☆☆☆ ☐ lathanides show +3 as a common oxidation state but only few of them exhibit +2 and +4 explain
- ☐ Lathanides show sharp line like bands
- ☐ lathanides prefer to form ionic compds why:
- ☐ Electronic config. of Samarium (Z = 62) and Europium (Z = 63) Eu(Z=63), Tm (Z=69), Gd (Z = 64), Ce(Z = 58), Dy(Z=66), Yb (Z=70)
- ☆☆☆ ☐ Two methods for the Sparation of Lathonides
- ☆ ☐ Which Actinides are used as a Nuclear fuel.
- ☆ ☐ Why heavier members of Actinides series do not form oxocations
- ☆ ☐ What is Nuclear fission give rex"
- ☐ Why is the chem. of Actinides more complex as compared to La.
- ☐ Why do magnetic properties of Actinides appear more difficat to interpret than both La & transition metals
- ☐ Name two important minerals of La.
- ☐ Is there an Actinides conc. similar to La conc.
- ☆☆ ☐ Colour and spectral property of La.
- ☆☆ ☐ More basic $La(OH)_3$ or $Lu(OH)_3$ & why?
- ☆ ☐ What is Actinide conc. Compare conc of La to Actinides
- ☆ ☐ Transuranic elements why these are unstable.
- ☆☆☆ ☐ ion exchange method for separation of La.
- ☆☆☆☆ ☐ Oxidation states of La & Actinides
- ☆☆☆ ☐ Lonthanide contraction — Consequences, Causes
- ☐ Variation of ionic radii among La.
- ☐ More basic Gd_2O_3 or YbO.
- ☐ Actinides exhibit +4, +5, +6 oxidation state
- ☆ ☐ Diff b/w La & Actinides
- ☆☆ ☐ Method of separation of Np, Pu and Am from U.
- ☐ Uranium from oxygenated ions such as UO_2^+.
- ☆☆☆ ☐ Complexation tendencies and paramagnetic behaviour of La & Actinides
- ☆ ☐ Isolation of La from monazite sand
- ☐ Compare La & Actinides with transition metals

- ☐ Lanthonides called inner transition elements
- ☐ La tendency to form complexes. (poor tendency)
- ☐ Electronic config. of La & their position in periodic table.
- ☐ Magnetic properties of La
- ☐ Coloured & complex formation properties of La
- ☐ Actinides form oxocations but lanthanides do not.
- ☐ Uranyl sulphate is treated with Na_2CO_3 then

$$UO_2SO_4 + 3Na_2CO_3 \longrightarrow Na_4[UO_2(CO_3)_3] + Na_2SO_4$$

- ☐ Uses of Lanthanides
- ☐ Chemistry of La is very similar
- ☐ Why do Zr and Hf have similar properties.
- ☐ Europium(II) is more stable than cerium(II)
- ☐ Actinides which are naturally occuring
- ☐ La^{3+} is diamagnetic while Sm^{3+} is paramagnetic
- ☐ Anti- penultimate shell
- ☐ Ce^{3+} is colourless while Pr^{3+} is coloured.

"Section-B"

- ☐ Ring test for Nitrate
- ☐ Chromyl test for chloride
- ☐ Ammonium Molybdate test for phosphate
- ☐ Flame test
- ☐ How X^- halogen ions can be detected together
- ☐ Method to detect NO_3^- (nitrate) in presence of NO_2^- (nitrite)
- ☐ I^{st} grp of basic radicals Pb^{2+} are not precipitated in hot soln
- ☐ Grp reagent for IInd grp of basic radicals is $H_2S\uparrow$ in presence HCl & for IVth grp basic radical is $H_2S\uparrow$ in presence of NH_4OH only.
- ☐ Interfering radicals & give example and method to remove phosphate ion when present as interfering radical in mixture.
- ☐ Nessler's Regent for Ammonium ion

- ☐ Interfering radical ?
- ☐ ★★ Concept of solubility product.
- ☐ Relation b/w solubility product & solubility
- ☐ Solubility product is 3.3×10^{-13} of AgBr Calculate solubility
- ☐ ★ Cond^{n} for precipitation and its theory
- ☐ ★★ Proces of digestion and Warming
- ☐ Application of solubility product in analytical chemistry.
- ☐ ★ Role of NH_4OH in grp III
- ☐ How you remove PO_4^{3-} before proceeding for 3rd grp.
- ☐ ★★★ Theory of Lake test of Aluminium
- ☐ H_2SO_4 is not used for preparing "Orginal sol" for basic radicals
- ☐ ★★★ Commonion effect & illustrate its application
- ☐ ★★ How you detect CO_3^{2-} in presena of SO_3^{2-}
- ☐ ★★★ Co-precipitation & post precipitation
- ☐ ★★ Qualitative test for (i) Br^- (ii) SO_4^{2-} (iii) Ca^{2+}
- ☐ ★ Chemistry of analysis of basic radicals of grp 1st
- ☐ Why NH_4Cl added in 3rd grp.
- ☐ Name various basic radicals of Grp IIA & IIB.
- ☐ ★★ Sodium carbonate Extract & its preparation
- ☐ Define Qualitative analysis give some types
- ☐ ★ Colour flame of Ba^{2+} & Sr^{2+} ion ~~Ca^{2+}~~
- ☐ ★★★ Test for SO_4^{2-} [Matchstick test]
- ☐ Name acid radicals that are treated with conc H_2SO_4
- ☐ ★ Role of Aluminium Hydroxide in grp III
- ☐ Test for separation of Ag^+, Hg_2^{2+}, Pb^{2+} ion
- ☐ ★★ Role of HCl in grp II
- ☐ ★ Role of NH_4Cl in grp III
- ☐ ferric chloride sol^{n} reacts with $K_4[Fe(CN)_6]$ sol^{n}
- ☐ Tin(II) chloride is added to Mercury(I) chloride.
- ☐ Removal of oxalate from a mixture
- ☐ ★ Distinguish CO_3^{2-} & HCO_3^-
- ☐ ★ Detection of Ni^{2+} ions in a sol^{n}

- [ ] Test for Cl ion under strong H_2SO_4 acid
- [ ] Solubility product V/s Ionic product
- [ ] Grp reagent for I, II, III, IV & IV.
- [ ] Detect Co^{2+} in presence of Ni^{2+}.
- [ ] Zn^{2+} does not precipitate with Cd^{2+} in grp II.
- [ ] Name the cation which gives Bluish green colour to the flame.
- [ ] How pH of sol^n affect solubility of precipitates
- [ ] Magnesia Mixture
- [ ] Structure of Ni[II] Dimethyl glyoxime {DMG}
- [ ] Original Sol^n.
- [ ] Acidic Radical which evolves gas with dil H_2SO_4
- [ ] Conc. HNO_3 is added to grp III.
- [ ] Formula of sodium cobaltinitrite
- [ ] Red colour flame