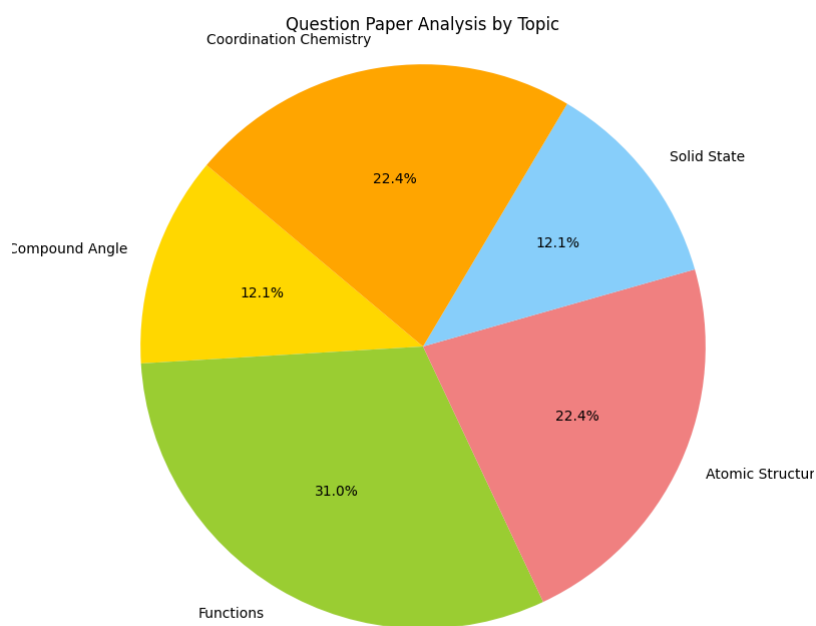
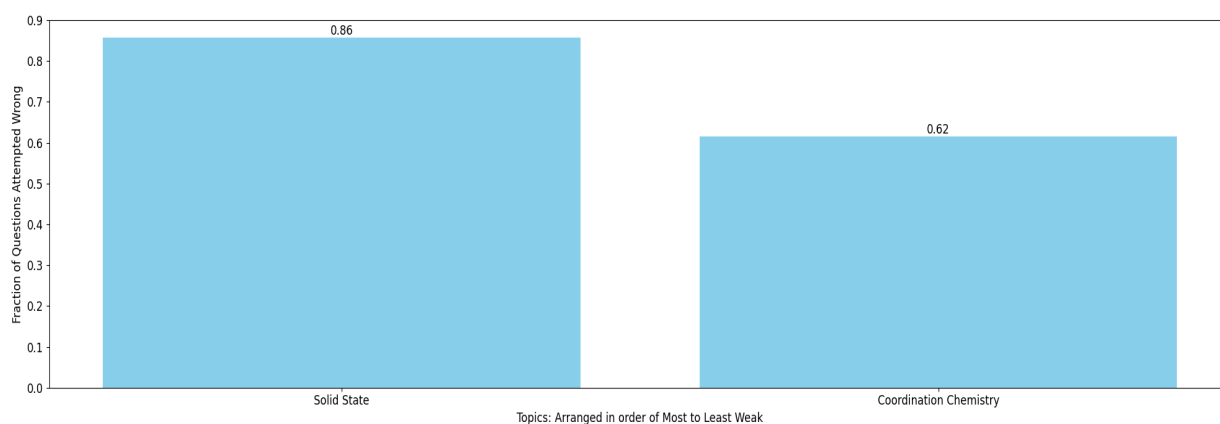


# Yash vilas raut Total MLAssist - Personalised DPP

## Question Paper Analysis:



## Weak Topic Analysis:



### Practice Questions:

#### Solid State:

19. Which of the following compounds is metallic and ferromagnetic?  
[Jee-Main (offline)-16]  
(A)  $\text{CrO}_2$  (B)  $\text{VO}_2$  (C)  $\text{MnO}_2$  (D)  $\text{TiO}_2$
38. In a compound, atoms of element Y form ccp lattice and those of element X occupy  $\frac{2}{3}$ rd of tetrahedral voids. The formula of the compound will be: [AIEEE-08]  
(A)  $\text{X}_4\text{Y}_3$  (B)  $\text{X}_2\text{Y}_3$  (C)  $\text{X}_2\text{Y}$  (D)  $\text{X}_3\text{Y}_4$
- 1.36 Å.
40. Which of the following is the most likely to show schottky defect  
(A)  $\text{CaF}_2$  (B)  $\text{ZnS}$  (C)  $\text{AgCl}$  (D)  $\text{CsCl}$
4. What is the percent by mass of titanium in rutile, a mineral that contain Titanium and oxygen, if structure can be described as a closet packed array of oxide ions, with titanium in one half of the octahedral holes. What is the oxidation number of titanium? (Ti = 48)

#### Coordination Chemistry:

14. Nickel ( $Z=28$ ) combines with a uninegative monodentate ligand  $\text{X}^-$  to form a paramagnetic complex  $[\text{NiX}_4]^{2-}$ . The number of unpaired electron in the nickel and geometry of this complex ion are, respectively. [AIEEE-2006]  
(1) one, square planar (2) two, square planar  
(3) one, tetrahedral (4) two, tetrahedral

13. **Statement-1:**  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  is coloured while  $[\text{Sc}(\text{H}_2\text{O})_6]^{3+}$  is colourless.  
**Statement-2:** d-d transition is not possible in  $[\text{Sc}(\text{H}_2\text{O})_6]^{3+}$  because no d-electron is present while possible for  $\text{Ti}^{3+}$  having  $d^1$  system.  
 (A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.  
 (B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.  
 (C) Statement-1 is true, statement-2 is false.  
 (D) Statement-1 is false, statement-2 is true.

#### Comprehension (Q.14 to Q.16)

Ligands are neutral or ionic species capable of donating at least one electron pair to central metal. Hence ligands can be of different denticities.

12. The number of donor sites in dimethyl glyoxime, glycinate, diethylene triamine and EDTA are respectively:  
 (A) 2, 2, 3 and 4      (B) 2, 2, 3 and 6      (C) 2, 2, 2 and 6      (D) 2, 3, 3 and 6
19. In which of the following pairs, both the complexes have the same geometry but different hybridisation  
 (A)  $[\text{NiCl}_4]^{2-}$ ,  $[\text{Ni}(\text{CN})_4]^{2-}$       (B)  $[\text{CoF}_6]^{3-}$ ,  $[\text{Co}(\text{NH}_3)_6]^{3+}$   
 (C)  $[\text{Ni}(\text{CO})_4]$ ,  $[\text{Ni}(\text{CN})_4]^{2-}$       (D)  $[\text{Cu}(\text{NH}_3)_4]^{2+}$ ,  $[\text{Ni}(\text{NH}_3)_6]^{2+}$

#### Comprehension (Q.20 to Q.22)

The crystal field theory (C.F.T.) is now much more widely accepted than the valence bond theory. It assumes that the attraction between the central metal and the ligands in a complex is purely electrostatic. According to C.F.T. ligands are treated as a point charge and crystal field splitting energy (CFSE) increases the thermodynamic stability of the complexes. Value of CFSE depends upon nature of ligand and a spectrochemical series has been made experimentally. For tetrahedral complexes,  $\Delta$  is about  $4/9$  times to  $\Delta_0$  (CFSE for octahedral complexes). This energy lies in visible region and i.e. why electronic transitions are responsible for colour.

61. A complex of certain metal has the magnetic moment of 4.91 BM whereas another complex of the same metal with same oxidation state has zero magnetic moment. The metal ion could be  
 (A)  $\text{Co}^{2+}$       (B)  $\text{Mn}^{2+}$       (C)  $\text{Fe}^{2+}$       (D)  $\text{Fe}^{3+}$

#### CFT