Here are the repetitive questions related to Coordination Chemistry (Chapter 5) from the provided sources, including the year, question number, and marks where available:

# Repetitive Questions from Chapter 5: Coordination Chemistry

1. **"Differentiate between double salt and complex salt."**
   * **2023:** Question 2 (Group A), 4 marks
   * **2019:** Question 6 (Group B), part of 8 marks
   * **2015:** Question 5(a) (Group B), part of 4+4 marks
   * **2021:** Question 7(c) (Group B), part of 8 marks (as "Double salt and Complex salt")
2. **"Werner's theory" / "Primary and Secondary Valency" / "Structure of complex based on Werner's theory."**
   * **2022:** Question 7(b) (Group B), part of 8 marks (as "Werner's coordination theory")
   * **2019:** Question 7(a) (Group C), part of 8 marks (as "Werner's theory")
   * **2018:** Question 6(a) (Group B), 6+2 marks: "What are the postulates of Werner's theory? Calculate the EAN of the central metal ions in the following complexes."
   * **2017:** Question 5 (Group B), 6+4 marks: "What are primary and secondary valences of metal? Explain the structure of K4 [Fe(CN)6] and [Co(NH3)6] Cl3 on the basis of Werner's co-ordination theory."
   * **2015:** Question 5(a) (Group B), part of 4+4 marks: (includes "Write the main postulates of Werner's theory.")
   * **2016:** Question 7(a) (Group B), part of 8 marks (as "Werner's co-ordination theory")
   * **2021:** Question 6(b)(i) (Group B), part of 4+4 marks (as "Werner's theory")
   * **2013:** Question 7(a) (Group C), part of 8 marks (as "Werner's coordination theory")
3. **"Valence Bond Theory (VBT)" / "Formation of complexes (tetrahedral, square planar, octahedral)" / "Inner and Outer orbital complexes" / "Magnetic properties."**
   * **2024:** Question 6 (Group A), 2 marks: "What are tetrahedral complexes? Discuss it."
   * **2023:** Question 7 (Group B), 4 marks: "Explain the geometry and magnetic properties of [Zn(NH3)4]2+ on the basis of VBT."
   * **2022:** Question 6 (Group B), 6+5+5 marks: "What are the postulates of valence bond theory? How does VBT explain the formation of tetrahedral and square planar complexes with suitable examples of each."
   * **2021:** Question 5 (Group B), 2+5+5+4 marks: "What are co-ordination compounds? How does Valence Bond theory explain the formation of [Fe(CN)6]4- and [CoF6]3- ions? Also predict its geometry and magnetic behavior with reasons. Give the differences between low spin complexes and high spin complexes."
   * **2019:** Question 6 (Group B), part of 8 marks: (includes "State the postulates of valence bond theory for the formation of co-ordination compound.")
   * **2019:** Question 7(c) (Group C), part of 8 marks (as "Valence bond theory")
   * **2018:** Question 6(b) (Group B), 6+2 marks: "State the postulates of valence bond theory for the formation of coordination compounds. Explain why octahedral complexes of Ni2+ ion are outer octahedral complex."
   * **2017:** Question 5(b) (Group C), 3+3 marks: "Write the postulate of VBT and explain its limitation."
   * **2016:** Question 5 (Group B), 6+10 marks: "Mention the differences between inner orbital and outer orbital complexes. How does VBT explain the formation of [Co(NH3)6]3+, [CoF6]3-."
   * **2015:** Question 7(a) (Group C), part of 8 marks (as "Postulates of V.B.T")
   * **2013:** Question 5 (Group B), part of 4+4 marks: "Differentiate between inner orbital and outer orbital octahedral complexes. Explain the formation of [Fe(H2O)6]SO4, [Pt(NH3)4Cl2]Cl2."
4. **"Effective Atomic Number (EAN) and its calculation."**
   * **2024:** Question 4(ii) (Group A), part of 2 marks: "Define following terms: (ii) EAN"
   * **2018:** Question 6(a) (Group B), part of 6+2 marks: (includes "Calculate the EAN of the central metal ions in the following complexes.")
   * **2021:** Question 6(b)(iii) (Group B), part of 4+4 marks: (includes "Effective atomic number and its application.")
   * **2021:** Question 7(b) (Group B), part of 8 marks (as "Effective atomic number and its application")
   * **2016:** Question 7(b) (Group B), part of 8 marks (as "EAN rule and its applications")
   * **2013:** Question 7(b) (Group C), part of 8 marks (as "EAN rule and its applications")
5. **"Applications of coordination complexes."**
   * **2019:** Question 7(b) (Group C), part of 8 marks (as "Application of complex compound")
   * **2018:** Question 7(c) (Group C), part of 8 marks (as "Applications of 3d transition elements") (Note: This is more general for transition elements, but complex formation is a key application).
   * **2013:** Question 7(c) (Group C), part of 8 marks (as "Application of co-ordination compounds")
6. **"Ligands and their classification."**
   * **2018:** Question 7(a) (Group C), part of 8 marks (as "Ligands and its classification")
   * **2018:** Question 7(c) (Group C), part of 8 marks (as "Ligands")
   * **2016:** Question 7(c) (Group B), part of 8 marks (as "Ligands")
7. **"Colour formation in complexes."**
   * **2024:** Question 14(b) (Group B), part of 4+4 marks: (includes "Complex formation" as a characteristic of transition elements)
   * **2023:** Question 13 (Group B), part of 2+1+5 marks: (includes "Explain the colour formation tendency of transition elements.")
   * **2022:** Question 7(c) (Group B), part of 8 marks (as "Colour formation in complexes")
   * **2021:** Question 6(b)(ii) (Group B), part of 4+4 marks: (includes "Formation of complex" as a feature of transition elements)
   * **2015:** Question 6(b)(iii) (Group B), part of 4+4 marks: (includes "Formation of colored compounds" as a property of transition metals)
   * **2016:** Question 6 (Group B), part of 4+1+2 marks: (includes "Explain the following with suitable reasons (c) Cu+ salt are colorless but Cu2+ salts are colored.")
   * **2022 Model:** Question 13(b), part of 2+3+3 marks: (includes "Explain the characteristics of 3d series transition elements with reference to (b) color formation.")

# Difference between double salt and comlex salt

Perfect 👍 You’ve already collected the key points — let me rewrite them into a **clear side-by-side comparison table** so it’s easier to read and remember:

**🔑 Differences between Double Salts and Complex Salts**

| **Feature** | **Double Salts** | **Complex Salts** |
| --- | --- | --- |
| **Composition** | Combination of two simple salts in **equimolar ratio** | May or may not contain simple salts in equimolar ratio |
| **Stability** | Retain identity only in **solid state**; lose it in solution | Retain identity in both **solid and solution state** |
| **Dissociation in water** | Dissociate completely into **all individual ions** (e.g., K⁺, Mg²⁺, NH₄⁺) | Do **not** dissociate into simple ions; produce **complex ions** instead |
| **Bonding** | No coordinate bonds present | Ligands are attached to the central metal ion through **coordinate bonds** |
| **Valency** | Metal ions show their **normal valences** | Metal ions exhibit **primary valence** (oxidation state) and **secondary valence** (coordination number) |
| **Example** | Potash alum: KAl(SO₄)₂·12H₂O (dissociates into K⁺, Al³⁺, SO₄²⁻) | Potassium ferrocyanide: K₄[Fe(CN)₆] (dissociates into K⁺ and [Fe(CN)₆]⁴⁻) |

⚖️ **In short:**

* **Double salts** behave like mixtures of simple salts in solution.
* **Complex salts** behave like **new compounds** with stable complex ions.

👉 Would you like me to also make a **mnemonic (memory trick)** so you can easily recall these differences during exams?