

SRM Institute of Science and Technology
Delhi-NCR Campus, Modinagar
CYCLE TEST – I (SET A)

Branch: CSE-AIML
 Subject: Chemistry
 Duration: 1 Hour

Session: I Sem/2022-23
 Code: 21CYB101J
 Max. Marks: 25 marks

Part A- Attempt all questions (1*5=5 Marks)

1. The coordination number in tetrahedral complexes is (Marks: 1; BL: 1,2; CO: 1; PO: 1)
 1)
 (a) 4 (b) 6 (c) 8 (d) 10
2. The type of isomerism exhibited by $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$ and $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Cl}_2 \cdot \text{H}_2\text{O}$ is
 (a) Linkage isomerism (b) Hydrate isomerism (c) Coordination isomerism (d) Ionization isomerism (Marks: 1; BL: 2; CO: 1; PO: 1)
 1)
3. As we move down the group in periodic table, the effective nuclear charge (Z_{eff})
 (a) Increases (b) Decreases (c) Remains constant (d) Increases then decreases (Marks: 1; BL: 1,2; CO: 1; PO: 1)
4. In octahedral complexes, the orbitals which belong to e_g set are
 (a) d_{xy} and $d_{x^2-y^2}$ (b) d_{xy} and d_{yz} (c) d_{z^2} and $d_{x^2-y^2}$ (d) d_{xy} and d_{z^2} (Marks: 1; BL: 1,2; CO: 1; PO: 1)
5. The energy change associated with the formation of anion from an isolated gaseous atom is termed as (Marks: 1; BL: 1; CO: 1; PO: 1)
 (a) Electronegativity (b) Electron affinity (c) Ionization energy (d) Pairing energy

Part B-Attempt ALL questions (10*2=20 Marks)

6. (a) Define coordination number and predict various probable geometries in metal complexes corresponding to coordination numbers 6 and 7. (Marks: 5; BL: 3; CO: 1; PO: 1)
- (b) Identify the trends of atomic radii in the periodic table and relate them with suitable reasons. (Marks: 5; BL: 4; CO: 1; PO: 1,4)

OR

- (a) Outline the main assumptions of Crystal Field Theory (CFT). (Marks: 5; BL: 4; CO: 1; PO: 1)
- (b) Construct the crystal field splitting diagram for $[\text{Fe}(\text{CN})_6]^{3-}$ and calculate its spin-only magnetic moment. (Atomic number of Fe = 26) (Marks: 5; BL: 3; CO: 1; PO: 1,4)
7. (a) Oxygen (O) has lesser ionization energy than nitrogen (N) atom. Explain it with proper reasons. (Marks: 5; BL: 3,4; CO: 1; PO: 1,4)
- (b) Illustrate the geometrical isomerism in inorganic complexes with suitable examples. (Marks: 5; BL: 3; CO: 1; PO: 1)

OR

- (a) Electron affinity of chlorine is higher than that of fluorine. Explain it with proper reasons. (Marks: 5; BL: 3,4; CO: 1; PO: 1,4)
- (b) Illustrate the differences between ionization isomerism and coordination isomerism with suitable examples. (Marks: 5; BL: 3; CO: 1; PO: 1)