

M.Sc.(Chem.) Semester - 2 (CBCS) Examination**April/May-2023 (NEW COURSE)****Inorganic Chemistry (CORE)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1(A) Answer the following question. (04)

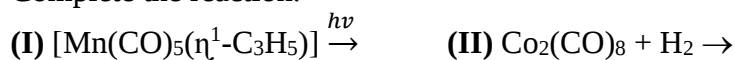
Briefly discuss the relationship between thermal energy and magnetic property.

Q.1(B) Answer the following question. (Any Two) (10)

1. Derive the equation for multiplet width comparable to kT . Explain with the help of Sm^{+3} metal ion.
2. Explain magnetic properties of the first transition series with the help of Ti^{+2} and Co^{+2} .
3. Explain the magnetic susceptibility measurement by Faraday's method and NMR method.

Q.2(A) Answer the following questions. (04)

1. Complete the reaction.



2. Calculate the number of electrons according to 18 electron rule.

**Q.2(B) Answer the following question. (Any Two) (10)**

1. Write a note on ligands similar to carbonyl ligand.
2. Explain the metal complexes having pi or extended pi system ligands.
3. Explain the reductive elimination by Pd-Catalyst and sigma bond metathesis reaction in OMC.

Q.3(A) Answer the following questions. (04)

Discuss the toxic effect of toxic metal ions.

Q.3(B) Answer the following question. (Any Two) (10)

1. Explain the importance and deficiency of Cu, Co and Mo.
2. Discuss the detoxification and chelating agents in medicine
3. Write a note on oxygen carriers and storage devices.

Q.4(A) Answer the following questions. (04)

Write a note on structure of borazine

Q.4(B) Answer the following question. (Any Two) (10)

1. Explain the manufacture of silicones.
2. Discuss the silicates with separate, chain and layered anions.
3. Write a detailed note on three dimensional silicates.

Q.5(A) Answer the following questions. (04)

1. What is nanomaterial? Give its examples with size.
2. Briefly discuss the classification of nanomaterials.

Q.5(B) Answer the following question. (Any Two) (10)

1. Write a note on chemical and magnetic properties of nanomaterials.
2. What are the methods for synthesis of nanomaterials? Explain any two.
3. Explain the characterization of nanomaterials via SEM and TEM.
