Roll No. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (Sem.–1)
INORGANIC CHEMISTRY
Subject Code : BSBT-101-18
M.Code : 75324
Date of Examination : 10-01-2023

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1.   **Answer briefly :**

   a)   Define electronegativity.

   b)   Why the first ionization energy of AI is lower than Mg?

   c)   Define atomic radius of an element.

   d)   Why the electron affinities of halogens are high?

   e)   State Slater's rule.

   f)   Calculate the bond order of O_2.

   g)   What is the hybridisation of H_2O molecule?

   h)   Write down the formula of the complex:

   Hexaamminecobalt(III) chloride

   i)   Write down the name of the following complex:

   $[CO(NO_2)_3(NH_3)_3]$

   j)   *"$[FeF_6]^3$ is colourless but $[Fe(SCN)]^{3-}$ is intense red coloured"*. Explain.

SECTION-B

2. Discuss the variation in ionisation energy along a period and down a group in periodic table.

3. Discuss Mulliken-Jaffe electronegativity concept.

4. Write down the shapes and hybridisation of following molecules or ions:

   NH_3, $SnCl_2$, SF_6, IF_7 and XeF_4.

5. Discuss geometrical isomerism in coordination chemistry with suitable example.

6. Discuss the formation of $[Cr(NH_3)_6]^{3+}$ complex ion on the basis of Valance Bond Theory (VBT).

SECTION-C

7. Describe the postulates of valance bond theory (VBT) of coordination compounds.

8. Write short notes on paramagnetism and diamagnetism.

9. Calculate the CFSE for following metal complexes:

   a) $[MnI_4]^{2-}$

   b) $[Fe(CN)_6]^{4-}$

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.