(180-PA-203331A) Roll No. .....

PAPER ID—10122

B. Sc. EXAMINATION, 2023

(Second Semester)

INORGANIC CHEMISTRY (I)

Code : CH-201

Time : 3 Hours *Maximum Marks : 30*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Section. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Which metal is present in chlorophyll ? 1

(b) What is meant by doping ? 1

(c) Which hybridization is involved in XeF_2 ? 1

(d) What is Freon ? Give example. 1

(e) Why is CCl_2F_2 used in refrigerators ? 1

(f) Arrange the bond angles of hydrides of group15 in decreasing order. 1

Section I

2. (a) What is H-bond ? What are essential conditions for H-bond formation ? Discuss its types. 3

(b) What is meant by intrinsic and extrinsic conduction ? 3

3. (a) Define Semiconductor. Discuss conduction of electrons in donor and acceptor type semiconductors. 3

(b) Explain, why : 3

(i) H_2S is gas and H_2O is liquid

(ii) Formic acid exists as dimer ?

Section II

4. (a) Explain the following : 4

(i) Lithium forms oxide, Na the peroxide and K the superoxide

(ii) Alkali metals dissolve in liquid ammonia to give blue solution.

(b) Which is stronger base NaOH or $Ba(OH)_2$? Explain why ? 2

5. (a) Why do noble gases form compounds only with fluorine and oxygen ? 2

(b) Discuss the Structure of XeF_4. How does it react with water ? 2

(c) Complete the following reactions : 2

(i) $XeF_6 + SiO_2 \longrightarrow$

(ii) $XeF_4 + SbF_5 \longrightarrow$

Section III

6. (a) What is back bonding ? Explain why does it occur in boron trihalides and not in aluminum trihalides ? 4

(b) CO_2 is gas while SiO_2 is solid at room temperature. Explain. 2

7. (a) Explain the structures of $(CH_3)_3N$ and $(SiH_3)_3N$. 3

(b) What are Carbides ? Discuss its different types. 3

Section IV

8. (a) Why is the bond angle of OF_2 is smaller than in Cl_2O ? 3

(b) SF_6 has zero dipole moment while SF_4 has non-zero dipole moment. Why ? 3

9. (a) Predict the shape of ClF_4^+ and IF_4^- ions. 2

(b) Compare acidic character of HClO, $HClO_2$, $HClO_3$ and $HClO_4$. 2

(c) Draw the structure of the following : 2

(i) Orthophosphoric acid

(ii) Pyrophosphoric acid.