[This question paper contains 4 printed pages.]

4723 *Your Roll No.* .....

B.Sc. (G) / III **AS**

CHEMISTRY – Paper VII

(Inorganic Chemistry)

Time : 2 Hours *Maximum Marks : 25*

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt **four** *questions in all.*
Question No. **1** *is compulsory.*

1. Fill in the blanks of any **Seven** of the following :

(i) According to valence bond theory, $K_4(Fe(CN)_6]$ is an _____ (inner/outer orbital) coupler.

(ii) The main pollutant responsible for green-house effect is _____ .

(iii) In qualitative analysis, sodium nitroprusside is used to detect _____ ion.

(iv) Solubility of iodine in liquid SO_2 is increased by an addition of KI. This is attributed to the formation of _____ .

(v) The complex $[Cr(NH_3)_6][Co(CN)_6]$ exhibits _____ isomerism.

P.T.O.

(vi) The geometry of XeF_6 is _____

(vii) _____ is an example of a fertiliser containing both nitrogen and calcium.

(viii) The Pt(II) complexes show _____ isomerism.

(ix) Manganate ions on oxidation with Cl_2 form _____

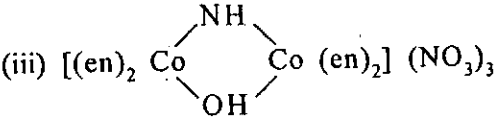
(x) A chelating ligand on coordination with central metal ion/atom results in _____ formation.

(1×7)

2. (a) Write the names of following complexes according to IUPAC system :

(i) $[Cr(H_2O)_4Cl_2]Cl$

(ii) $Na_3[Ag(S_2O_3)_2]$

(iii) 

(iv) $K_4[Fe(CN)_6]$ (3)

(b) Write the formula of the following complexes :

(i) Tetraammine platinum(II) tetrachloro platinate(II)

(ii) Potassium trioxalato chromate (III)

(iii) Pentaammine nitrito cobalt(III) sulphate

(iv) Tetracarbonyl nickel (0) (3)

3. (a) What happens when ? (Give chemical equations)

(i) Sodium cobaltinitrite reacts with KCl.

(ii) $KMnO_4$ reacts with oxalic acid in acidic medium.

(iii) Nacl is heated with $K_2Cr_2O_7$ and Conc.H_2SO_4.

(iv) .KI is treated with alkaline $KMnO_4$ solution. (1×4)

(b) Explain why transition elements show variable valency ? (1)

(c) How is the fertiliser calcium cyanamide manufactured ? (1)

4. (a) Account for the following statements ?

(i) Transition elements form a large number of complexes.

(ii) An aqueous solution of $CuSO_4$ is colored but $ZnSO_4$ is colorless.

(iii) Transition elements act as good catalysts.

(iv) Acetamide behaves as a weak base in aqueous medium but shows acidic properties in liquid ammonia. (1×4)

P.T.O.

(b) What is the root cause of acid rain ? Highlight its consequences ? (2)

5. (a) On the basis of valence bond theory, find out the number of unpaired electrons in $[FeF_6]^{3-}$ and $[Fe(CN)_6]^{3-}$. (1×2)

(b) How is XeF_4 prepared ? How does it react with (i) H_2O (ii) NaF. (2)

(c) How is potassium ferricyanide prepared from potassium ferrocyanide ? Give its reaction with $FeSO_4$ solution. (2)

6. (a) Write self ionisation equation for liquid SO_2. Indicate the reaction of

(i) $SOCl_2$ and $(NH_4)_2SO_3$ in liquid SO_2

(ii) PCl_5 and SO_2 in liqu SO_2. (1×3)

(b) Draw the various stereoisomers for the complex $[Co(en)_2Cl_2]^+$. (2)

(c) Explain what is photochemical smog ? (1)