PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(First Semester)

Branch - **CHEMISTRY**

INORGANIC CHEMISTRY - I

rime : Three Hours Maximum : 75 Marks

Answer **ALL** questions
ALL questions carry EQUAL marks (5 x 1 5 -- 75)

1 a What arc the salient features of crystal field theory? Write down its limitations. , (6)

b For the complex ion $[Cr(II_20)_6]^{2*}$, the pairing energy is found to be 23500cm'[1]. The value of A_0 is 13900 cm'[1]. Calculate the crystal field stabilization energy for the complex in weak filed (high spin) and strong field(low spin) states. (4)

c State and explain BAN rule with an example. (5)

OR

d Draw the crystal filed splitting energy level diagram of $[Ni(CN)_4]^{z'}$ and account for its diamagnetic character. (5)

c Draw the MO diagram for low spin $[Co(NII_3)_6|^{3+}$ and explain. (6)

f Explain the formation of $| CoF_6]^{\wedge'}$based on VB theory. (4)

2 a What are the selection rules for electronic transitions? Explain. (6)

b Derive the ground state term for d configuration. (3)

c Discuss the Orgel diagram for the $C0^{2>}$ ion in octahedral and tetrahedral fields. (6)

OR

d Discuss briefly the importance of Guoy method. (5)

c Describe the effect of spin-orbit coupling on magnetic properties. (6)

f Distinguish between ferro magnetism and antiferro magnetism. (4)

3 a Explain briefly the 7t -bonding and polarization theories of transcffcct. (6)

b What are racimisation and isomerisation? (4)

c State and explain S_N1 reaction mechanism. (5)

OR

d What are inner sphere ad outer-sphere mechanisms? Explain them with suitable examples. (8)

e Discuss any two applications of trans effect. (4)

f What arc non-complementary electron transfer reactions? Give one example and explain. (3)

4 a What is meant by stereo isomerism? What are its two types? Explain them with one example each. (6)

b Discuss the geometry of coordination complexes with coordination number four. (5)

c Explain' briefly the geometry and possible isomers of the complex $[\blacksquare Pt(NH_3)_2Cl_2]$. (4)

OR

d Describe briefly the possible arrangements of the complex having six coordination number. (5)

c Predict the possible geometry of the complex having five coordination number. (5)

f Write down any three method which can be used to distinguish between cis and trans isomers. Explain briefly how they are distinguished? (5)

5 a What arc super acids? Explain them. (4)

b Whafare oxyacids? Discuss the strength of HCIO, HCIO2, IICIO3 and IICIO4 in detail. (6)

c What is meant by hydrogen bonding? How is it classified? Explain them with suitable examples. (5)

OR

d What is Pearson's principle on acids and bases? Explain briefly the concept of I IS AB and its classifications. ■ (7)

c Explain briefly the Usanovich concept of acids and bases with suitable examples. (4)

f What is meant by symbiosis? Explain its with suitable examples. (4)

z-z-z **END**