Registration no: | | | | | | | | | | |

Total Number of Pages: 01 **M.Sc.I**

FCYC503

5th Semester Back Examination:2019-20
Inorganic Chemistry-IV
BRANCH: M.Sc.I (AC)
Max marks: 70
Time: 3 Hour
Q.Code: HB502
Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

a) Describe the structure of ClF_3 and XeF_2 by using VSEPR theory.
b) Why the H-M-H bond angle decreases down the group for group-V hydrides?
c) Give examples of compounds having p_π-d_π interaction.
d) Write the postulates of Bent's rule.
e) Which orbitals are involved in the formation of square planar complexes?
f) Write drawbacks of CFT.
g) Write an expression for overall and stepwise stability constant of the reaction:
$M + nL \rightarrow ML_n$
h) How oxidation states of metal affect the stability of complex?
i) What is the ground state term for d^5-metal ion?
j) Write the selection rules for electronic transition?

Q2 Discuss Walsh diagram for MX_2 molecule. **(10)**

Q3 Discuss the formation of molecular orbitals in square planar complexes. **(10)**

Q4 a) What are the factors affect the stability of complexes? **(5)**
b) Write the difference between thermodynamic and kinetic stability. **(5)**

Q5 a) A thermodynamically stable complex may or may not be kinetically inert. Explain with suitable example. **(5)**
b) Propose a suitable sequence of synthesis to synthesize *cis* and *trans* isomers of $[PtCl_2(NO)_2NH_3]$ from $[PtCl_4]^{2-}$. **(5)**

Q6 a) Describe the mechanism of anation reaction. **(5)**
b) Write the factors which affect the rate of SN^1 mechanism. **(5)**

Q7 a) Write the theories of trans effect? **(7)**
b) What is Swain-Scott equation? Write its significance. **(3)**

Q8 a) Discuss the Orgel diagram for a tetrahedral d^1 configuration? **(5)**
b) What is absorbance? Derive an expression for it by applying Beer-Lambert's Law? **(5)**