AI—48—2017

FACULTY OF SCIENCE

M.Sc. (First Year) (Second Semester) EXAMINATION

MARCH/APRIL, 2017

(CBCS Pattern)

CHEMISTRY

Paper II (CH-421)

(Inorganic Chemistry)

(Friday, 21-4-2017)   **Time : 10.00 a.m. to 1.00 p.m.**

Time— Three Hours   *Maximum Marks—75*

N.B. :—   (*i*)   Attempt *all* questions.

       (*ii*)   Log table and calculator are allowed

       (*iii*)   Solve MCQ once only.

1.   Solve any *three* :   15

   (*a*)   Distinguish between Schottky and Frenkel defects.

   (*b*)   Explain Cis effect with suitable examples.

   (*c*)   Explain the role of Rhodium catalysts in carbonylation of methanol to form acetic acid.

   (*d*)   What is catalyst ? Give its classification.

   (*e*)   What are metalloporphyrins ? Draw the structure of heme.

2.   Solve any *three* out of five :   15

   (*a*)   Explain the language of catalysis with reference to catalytic cycles.

   (*b*)   Describe PS-I and PS-II mechanism in photosynthesis.

   (*c*)   Explain structure and bonding in iron transporting biomolecules with suitable examples.

   (*d*)   Explain Wacker oxidation of alkenes.

   (*e*)   How will you prepare cis and trans $[Pt (NH_3)_2Cl_2]$ starting from $[Pt Cl_4]^{2-}$.

                                                  P.T.O.

3. (a) Explain hydroformylation reaction for synthesis of aldehydes. 8

Or

Distinguish between hemoglobin and myoglobin.

(b) Illustrate the π-bonding theory to explain substitution in square planar complexes. 7

Or

Distinguish between cis and trans isomers of [Pt $(NH_3)_2Cl_2$] by Kurnakov's test

4. (a) Explain structure and function of cyanocobalamine. 8

Or

Explain the role of Ferredoxin and Rubredoxin in biological systems.

(b) What are non stoichiometric defects ? Give their consequences. 7

Or

(i) Calculate limiting radius ratio for coordination number four. 4

(ii) Explain the importance of super oxide dismutase. 3

5. (a) Select the *correct* answer from the given options : 5

(i) The O_2 binding curve of hemoglobin is ....

(a) Sigmoidal   (b) Hyperbolic

(c) Parabolic   (d) Circular

(ii) The oxidation of SO_2 to SO_3 is carried out by ....

(a) Wilkinson's catalyst

(b) Potassium vanadate supported by silica

(c) Alumina catalyst

(d) Palladium catalyst

(*iii*) Limiting radius ratio of ionic crystal with coordination number three is ....

(*a*) 0.1555   (*b*) 0.225

(*c*) 0.414   (*d*) 0.732

(*iv*) Which one of the following metal is used as anti-arthritis drug.

(*a*) Au   (*b*) Fe

(*c*) K   (*d*) Ca

(*v*) Osmatic balance of body is maintained by :

(*a*) Na/K pump   (*b*) Ca/K pump

(*c*) Ca/mg pump   (*d*) Na/mg pump

(*b*) Write notes on (any *two*) :   10

(*a*) Cis-platin as drug

(*b*) Imaging agent

(*c*) New directions in heterogeneous catalysis.