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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 $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ starting from $[\text{PtCl}_4]^{2-}$.

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 $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ 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) Osmotic 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.