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L—43—2019

FACULTY OF SCIENCE

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

MARCH/APRIL, 2019

(CBCS Pattern)

CHEMISTRY

Paper II (CH-421)

(Inorganic Chemistry)

(Tuesday, 23-4-2019)

Time : 10.00 a.m. to 1.00 p.m.

Time—3 Hours

Maximum Marks—75

N.B. :— (i) Attempt All questions.

(ii) Log table and calculator are allowed.

(iii) Solve MCQs once only.

1. Solve any *three* : 15
 - (a) Draw and explain layer structure of CdI_2 .
 - (b) What happens when $[\text{Pt}(\text{NO}_2)\text{Cl}_3]^{2-}$ is treated with NH_3 .
 - (c) What is the basis of Ziegler-Natta polymerization ? Explain the role of $\text{Al}(\text{C}_2\text{H}_5)_3$ in the catalytic system.
 - (d) Describe possible mechanism of conversion of SO_2 to SO_3 .
 - (e) Describe Hb- O_2 binding curves of different pH.
2. Solve any *three* : 15
 - (a) Explain Wacker oxidation of alkenes.
 - (b) What happens when Fe-porphyrine complex without polypeptide chain comes in contact with O_2 ?
 - (c) Discuss the structure and function of Rubredoxin.
 - (d) Explain importance of Tethered catalysis with suitable examples.
 - (e) What is trans effect ? How does it influence substitution in square planar complexes ?

P.T.O.

3. (a) Explain mechanism of palladium catalysed C-C bond forming reactions with suitable examples. 8

Or

What is nitrogen fixation ? Explain the role of nitrogenase enzyme in nitrogen fixation.

- (b) Illustrate the polarization theory of 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 Kurnakav's test.

4. (a) What is Photosynthesis ? Explain the *four* step oxidation of water to release O_2 in photosystem-II. 8

Or

Discuss the structure and function of Transferrin.

- (b) What are stoichiometric defects ? Give its consequences. 7

Or

- (i) What is P-type semiconductor ? Explain its conductivity. 4

- (ii) Explain the importance of super dioxide dismutase. 3

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

(i) In nitrogen fixation, nitrifying bacteria convert

(a) NO_3^- to NH_4^+

(b) N_2 to NH_2^+

(c) NH_4^+ to NO_3^-

(d) NH_2^+ to N_2

- (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) In Frankel defect
- (a) Some of the lattice sites are vacant
 - (b) An ion occupies interstitial position
 - (c) Some of the cations are replaced by foreign ions
 - (d) None of the above
- (iv) Which *one* of the following metal is used as an anti-cancer drug ?
- (a) Pt
 - (b) Au
 - (c) K
 - (d) Fe
- (v) Which symbiotic bacteria is capable of fixing N_2 ?
- (a) *Clostridium pasteurianum*
 - (b) Rhizobia
 - (c) *Azobactor*
 - (d) Nitrogenase
- (b) Write notes on (any two) :
- (i) Inhibition of DNA by cisplatin
 - (ii) Imaging agent
 - (iii) Catalytic efficiency and life time

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