ISLAMIAH COLLEGE [AUTONOMOUS],
VANIYAMBADI
CIA TEST - II MARCH 2020

TIME: 3 Hrs. MAX. MARKS: 75

II M.Sc. Chemistry **IV Semester** **P8CH4001**

INORGANIC CHEMISTRY - IV

PART-A (5X6=30 MARKS)
Answer All Questions

1. (a) What is Koopmans' theorem? Discuss its significance.

Or

(b) Is charge Transfer spectra an allowed transition? Discuss

2. (a) How would you identify geometrical isomerism using UV- Visible spectroscopy?

Or

(b) What happens when 'x' in the complex $[Co(CO)(NO)\ PCl_x\ PPh_{3-x}]$ is increased from 0 to 3?

3. (a) What is Chemical Shift? How is it different from J- Values.

Or

(b) Differentiate the P^{31} NMR spectra of metaphosporic acid, phosporous acid and phosphoric acid

.

4. (a) What is the g-value? Discuss its significance.

Or

(b) Explain nuclear and non nuclear applications of lanthanides and actinides.

5. (a) Elaborate the mechanism of Nitrogen fixation.

Or

(b) Explain the biological importance of Magnesium

PART-B (3X15=45MARKS)
Answer any three Questions

6. (a) Discuss the UV visible spectra for Base-Iodine Complex (10)
(b) Write briefly about Augur Effect. (5)

7. (a) Treat ClF_3 molecule with C_2V point group and arrive at possible IR or Raman frequencies (10)
(b) How do the metal ligand stretching vibrations vary for SCN and NCS liganded complexes?

8. (a) Discuss the EPR spectral lines for Mn^{2+} ion indicating the applications of zero field splitting and kramer degeneracy in the complex.(6)

(b) What is the principle of NMR spectroscopy? Explain how this spectroscopy is used to identify Cis and Trans complexes of $C_4H_4(N\text{-}C_6H_5)_2$.

9. (a) Explain the spectral and magnetic characteristics of Lanthanides.(7)
(b) Discuss various preparatory methods of nano particles. (8)

10. (a) Explain the importance of Magnesium in the process of photosynthesis (9)

(b) Discuss the mechanism of carbonic anhydrase and carboxypeptidase being used as catalysts.(6)

20 copies Dr. SRMK

ISLAMIAH COLLEGE [AUTONOMOUS],
VANIYAMBADI
CIA TEST - II MARCH 2020

TIME: 3 Hrs. MAX. MARKS: 75

II M.Sc. Chemistry **IV Semester** **P8CH4003**

PHYSICAL CHEMISTRY - IV

PART-A (5X6=30 MARKS)
Answer All Questions

1) a) Write a brief note on Fuel cells.
(or)
b) Derive the Butler Volmer Equation for one step electron transfer reactions

2) a) Write short notes on distinguishable and indistinguishable particles.
(or)
b) Evaluate the translational partition function for mono atomic gases.

3) a) What is electron gas? explain
(or)
b) Write short note on Maxwell Boltzmann distribution law.

4) a) What are excimers? How will you distinguish it from photodimers?
(or)
b) Derive the kinetics of bimolecular photphysical processes.

5) a) Elaborate any one method of life time measurements
(or)
b) How is the photo assisted electrolysis of water carried out?

PART-B (3X15=45 MARKS)
Answer any Three Questions

6) Write a detailed account on electrochemical inorganic reactions of technological interest with suitable examples.

7) Write a short notes on
a) Einsteins theory of heat capacity of solids. (7)
b) Ortho and para hydrogen. (8).

8) Compare MB, BE, FD statistics.

9) a) How are the light sources standardized using Uranyl oxalate actinometer ? (7)
b) Elaborate Static and dynamic quenching (8)

10) Write a detailed note a) Photo electro chemical cells (7)
b) solar energy storage and conversion (8)

26 copies Dr. MAS

ISLAMIAH COLLEGE [AUTONOMOUS], VANIYAMBADI
CIA TEST - II MARCH 2020

TIME: 3 Hrs. MAX. MARKS: 75

II M.Sc. Chemistry **IV Semester** **P8CH4002**

ORGANIC CHEMISTRY - IV

PART-A (5X6=30 MARKS)
Answer All Questions

1. a) Explain the synthesis of Alkyl Nitriles from the respective halides by phase transfer catalysis.

   Or

   b) Illustrate the available methods for protection and deprotection of R-COOH and RNH2.

2. a) Explain the use of sulphur ylides.

   Or

   b) Write a note on one group disconnection.

3. a) Elucidate the structure of alpha ONOCERIN and discuss its synthetic routes.

   Or

   b) Explain the retero synthesis of CH_2= CH-CH_2-CH_2-CH_2-COOH.

4. a) Explain the Reformatsky synthesis of retinol.

   Or

   b) Give the synthesis of flavones and isoflavones.

5. a) What are free radicals? How do they react with olefinic double bonds?

   Or

   b) Discuss the mechanism and salient features of Gomberg reaction.

PART-B (3X15=45 MARKS)
Answer any Three Questions

6. a) Explain the role of diols and dithiols in the protection and deprotection of functional groups with examples. (10)

   b) List out the uses of Trimethylsilyliodide in synthetic organic chemistry. (5)

7. Write the synthesis of purine and pyrimidine bases.

8. Illustrate the retero synthesis of Bicyclo-(4:1:0)-hept-2-one.

9. Explain functional group interconversion with an example. Differentiate logical ana illogical disconnections

10. Explain the following reactions with Mechanism.
    i) Hundsdiecker reaction
    ii) Ulmann reaction
    iii) Pschorr reaction

30 copies Dr.KAR