

17/11/17 Ad
S.No. 8158

P 8 CH 6/P 8 OC 6

(For candidates admitted from 2008–2009 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017

Chemistry/Organic Chemistry

INORGANIC CHEMISTRY – II

Time : Three hours

Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$)

Answer ALL questions.

1. Why have certain elements been 'selected' for use in biological systems?
2. What are biominerals? Give suitable examples.
3. Mention the functional distinction between Haemoglobin and Myoglobin.
4. List out any four non-heme iron enzymes.
5. Define detoxification.
6. Explain drugs with suitable examples.
7. Give two examples for dinitrogen complexes.

8. What is 18 electron rule?
9. What is epoxidation reaction? Give examples.
10. Define catalysis. Give examples.

SECTION B — ($5 \times 5 = 25$)

Answer ALL questions.

11. (a) Describe nucleation and crystal growth.

Or

- (b) Explain the chemistry of Photosystem I and II in detail.

12. (a) Describe the structural and functional aspects of Rubredoxins.

Or

- (b) Explain the structure and properties of Cytochrome c oxidase.

13. (a) What are metalloenzymes? How it function as catalyst in biological reactions?

Or

- (b) Discuss the mechanistic action of cisplatin as anticancer drug.

14. (a) Describe the structure and bonding in metal carbonyls.

Or

- (b) Brief on the electronic structure of metallocene complexes.

15. (a) Comment on the difference between ligand association and dissociation.

Or

- (b) Discuss the reaction mechanism of olefin metathesis polymerization.

SECTION C — ($3 \times 10 = 30$)

Answer any THREE questions.

16. Describe the oxidation of H_2O to O_2 with one electron oxidant catalysed by manganese.

17. (a) Discuss the electron transfer activation in cytochrome P450. (5)

- (b) Write a detail note on urease. (5)

18. (a) Give account on detoxification. How metal chelation play role on it? Explain. (5)

- (b) Indicate the distinction between oil and fats. (5)

16. (a) Discuss the neutron diffraction by Debye-Scherrer Hull method with an example.

Or

- (b) Explain the measurement technique for typical electron diffraction by gases.

SECTION C — ($3 \times 10 = 30$)

Answer any THREE questions.

16. Describe the important changes occur due to interaction of electromagnetic radiation with molecules.
17. Explain the various techniques involved in the simplification of C^{13} spectra.
18. Elaborately discuss the different factors influencing group frequencies in IR spectroscopy.
19. Describe the fragmentation modes in mass spectroscopy and list out the factors affecting fragmentation.
20. How to elucidate the structure of magnetically ordered unit cell by neutron diffraction? Explain it.

S.No. 8173 20/11/17 FR

P 16 CH 12

(For candidates admitted from 2016–2017 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

Chemistry

INORGANIC CHEMISTRY — I

Time : Three hours

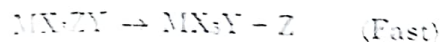
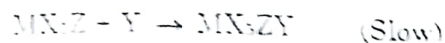
Maximum : 75 marks

PART A — ($10 \times 2 = 20$)

Answer ALL questions.

1. How will you prepare S_4N_4 ? Draw its structure.
2. What are high temperature super conductors? Give an example.
3. What do you mean by chelation and chelate effect?
4. The $\log \beta$ values of $[Fe(CN)_6]^{3-}$ and $[Fe(CN)_6]^{4-}$ are 31 and 8.3, respectively. Why?
5. Calculate the spin only magnetic moment of $[Co(NH_3)_6]^{2+}$.
6. Sketch the crystal field splitting in tetrahedral ligand field.

7. Write a rate equation for the following reaction. What is the order of the reaction?



8. What is meant by template synthesis?
9. What do you mean by charge transfer transition?
10. What do you mean by chemical actinometry? Give an example.

PART B — (5 × 5 = 25)

Answer ALL questions.

11. (a) Write a note on Wade's rules with examples.

Or

- (b) Write a note on photographic process.

12. (a) What do you mean by stepwise and overall formation constants? How are they related?

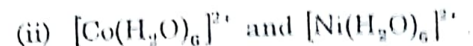
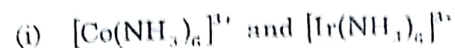
Or

- (b) Explain photometric method of determination of stability constant of complexes.

13. (a) What are the important postulates of CFT? What are the limitations of CFT?

Or

- (b) Among the following pairs of complexes which one will exhibit relatively higher crystal field splitting? Explain why?



14. (a) Explain the dissociation mechanism substitution reaction in octahedral complexes.

Or

- (b) Explain the mechanism of rearrangement reaction in six coordinated complexes with example.

15. (a) Write a note on charge transfer transition complexes.

Or

- (b) Explain the mechanism of CTM.

7. Considering electron waves just as the waves of a string, which is held fixed at two ends $x = 0$ and $x = a$, derive Schrodinger equation for a particle in one dimension.
 18. Derive the rate law for the $H_2 - Br_2$ chain reaction following two chain-propagating steps.
 19. Discuss the application of Fermi-Dirac statistics to free electrons in a metallic conductor.
 20. Explain flash photolysis method of studying the kinetics of fast reactions.
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