

Roll No.

(12/24)

15023

M.Sc. EXAMINATION

(For Batch 2021 & Onwards)

(Third Semester)

CHEMISTRY

MSc/Chem/3/DSCI-I

Inorganic Chemistry Special-I

Time : Three Hours

Maximum Marks : 70

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory containing five short answer type questions.

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|--|---|
| 1. (i) Define Quantum Yield. | 2 |
| (ii) What do you mean by fluorescence lifetime ? | 2 |
| (iii) Define excited states of metal complexes. | 2 |
| (iv) Define photo oxidation. | 2 |
| (v) Give any two physical properties of a solvent. | 2 |

Unit I

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|---|-------|
| 2. (a) Discuss fluorescence and phosphorescence with the help of Jablonski diagram. | 8 |
| (b) Discuss Franck Condon Principle in detail. | 7 |
| 3. Write short notes on the following : | 5,5,5 |
| (i) Absorption spectra | |
| (ii) Flash photolysis | |
| (iii) Beer's- Lambert's law. | |

Unit II

4. (a) Discuss the photochemical kinetics with examples. 7
- (b) Write a note on bimolecular deactivation. 8
5. (a) Discuss charge transfer spectra of metal complexes in detail. 8
- (b) Explain the electronically excited states of metal complexes. 7

Unit III

6. (a) What do you mean by photo-reduction, photo-substitution and photo-oxidation. 9
- (b) What is the role of metal ions and metallo complexes in luminol chemiluminescence ? 6
7. (a) What is the difference between an excimer and an exciplex formation ? Write the mechanism of it ? 8
- (b) Write a short note on redox behavior of ruthenium. 7

Unit IV

8. (a) What are protic and aprotic solvents ? Give examples. 5
- (b) Discuss the mechanism of coordination reactions in non-aqueous media. 10
9. (a) Explain the reaction in non-aqueous media with reference to H_2SO_4 and BrF_3 . 10
- (b) Discuss reactions in molten state. 5