PD– 375 CV-19

M.Sc, Chemistry (Third Semester)
Term End Examination . Dec.-2020
Compulsory/Optional
Group-
Paper – IV

Name/ Title of Paper: Photo in-organic chemistry [Maximum Marks : 80
Time : Three Hours] Minimum Marks : 29

Note : Answer from Both the section as Directed. The figures in the right hand margin indicate marks.

Section-A

1- Answer the following questions: 1X10

(a) What do you understand by non rodentine processes.
(b) What do you mean by triplet excited state
(c) What is charge transfer excitation
(d) Which excited state has long life
(e) What do you understand by the term excitation
(f) How the excited species can be completely different to normal state molecule
(g) What is a diabetic photochemical reaction.
(h) Singlet excitated state alid dissociation constant PK* can be smaller or greaten than the group state PK- for phens.
(i) Define metal complex sensitiger.
(j) What is d-d state states or legend field state

2- Answer the following question 2X5=10

(a) What is quantum yield? The quantum yield is different for deferent substitution reaction why?
(b) Explain briefly himerecular deactivation dwindling.
(c) Give the distinctive properties of exciters and exalted state demurs. How the change transfer meonanism. Explain the quenching.
(d) Explain the excretal state redox potential with example of FC^2/FC^{3+} and methylene blue complex.

OR

What is intermolecular potoxidation reaction.

OR

Mechanism of photoaqution reaction.

(e) Illustrate the redox character of ruthenium^{2+} bipiridil complex.

OR

Explain what is low Hing energy states in transition metal complexed?

OR

What are utility of redox process of electronically exceted state for cataly he purposar.

Section-B

Answer all questions marks are shown against each question.

Unit-I

3- a- Clarify eienstein S law of photochemical equation and justify that the energy absorb by one I am molecule is inversely proportional to the wave length of radiation. 7

b- Explain the causes of law & high quantum efficiency. 5

Or

a- Discuss the various processer occurring in the excatal state. 7

b- Discuss the principle for investigating the vibrational stracture of electronic spectra Or Discuss the principle concernal with mechanism of photoinduled chemical reaction. 5

Unit-II

4- Explain the shift in 0-0 transition due to solveot interaction in the two state of different polarity for absooption and emission processes. 12

Or

Describe the stricture parity and acid base stroath of exacted state. 12

Unit-III

5- a- Discuss the comparison of excitation of metal. Complexes with organic compounds by photos. 6

b- What do you understand by MLCT transition. 6

Or

a- Discuss the LINCT Transitonof octahedral Cr(III) complexes. 6

b- Explain one method for obtaining charge I transfer spectra . 6

Unit-IV

6- a- Illustrate the reducing and oxidising character of $[Ru(bipy)_3]^{2+}$ and crapare the properties with $[Fe(bidy)3]^{2+}$ 7

b- What is intermoledcular photo oxidation reaction 5

Or

a- Write explanatory notes on the following 12

i- Water Photolysis

ii- Zero-Zero spectroscopic energy

Unit-V

7- a- Explain the enaracterstric phosphorescence spectry of the following inorganic complexs. 12

i- $3(\Pi - \Pi *)$ State in [Rn(phen)3]CLO4

ii- $3(d - \Pi *)$ State in [Rn(bipy)3]Cl2

iii- $3(d - d)$ State in solid [Rn Cl2(phen)2]Cl.

Or

a- How do you account for energy transfer photochemical reaction under conditions of weak and strong interaction. 7

b- How the inergy changes will take place when $[Ru(bipy)_2]^{3+}$ Ions absesh leybl? Explain. 5