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Roll No.	Fotal No. of Pages : 02
Total No. of Questions : 09	
M.Sc.(Chemistry) (2015 to 2017 Batch E-II PHOTOCHEMISTRY Subject Code:MSCH-412 M.Code:71680) (Sem.–4)
Time : 3 Hrs.	Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

- 1. Attempt FIVE questions in ALL including COMPULSORY questions no. 1.
- 2. Selecting ONE each from UNIT-I to IV.
- 3. All Questions carry equal marks.

1. Answer briefly :

- a) Define the terms : suprafacial and antarafacial w.r.t photochemical reactions.
- b) What do you mean by Norrish type-II reaction?
- c) Describe internal conversion.
- d) Discuss oxetane formation with chemical reaction.
- e) What is resonance fluorescence? Give an example.
- f) Define Stark-Einstein law.
- g) Discuss the physical significance of extinction coefficient.
- h) What is meant by primary and secondary process in photochemistry?
- i) What do you mean by spin forbidden transitions? Give the selection rules governing them.
- j) Discuss Photosensitization reaction with example.

SECTION-B

UNIT-I

- 2. a) Describe Photo-Fries rearrangement and formation of peroxy compounds.
 - b) Discuss photochemical isomerization in details with mechanism.

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- 3. a) Trans-3,4-dimethylcyclobutene can open by two conrotatory paths to give either [2E, 4E] or [2Z, 4Z]-hexadiene. Explain why both products are symmetry allowed, and then account for the fact that only [2E, 4E] isomer is obtained in practice?
 - b) Discuss the mode of energy transfer from one molecule to the other. Also explain $n-\pi^*$ and $\pi-\pi^*$ excitation with the example of benzophenone molecule.

UNIT-II

4. a) Discuss in details the photo-assisted electrolysis of water.

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- b) Write a detailed note on photo-rearrangement reaction with mechanism.
- 5. a) Describe laser action with reference to a three level laser and a four level laser.
 - b) Describe photo-substitution reaction in Inorganic Complexes.

UNIT-III

- 6. a) What do you understand by quenching of fluorescence? Describe and derive Stern-Volmer equation.
 - b) Discuss in details about photochemical equilibrium. Give two examples.
- 7. a) What do you mean by free energy? What is free energy change of photochemical reactions? Comment on the same giving reasons.
 - b) Describe in details theory of radiation less transition in photochemistry.

UNIT-IV

- 8. a) Describe the measurement of non-relative lifetime in a photochemical reaction.
 - b) Describe in details, the photochemistry of vision.
- 9. a) Write a detailed note on mercury photosensitized reactions with mechanism and different processes involved in the same.
 - b) Describe chemical actinometry in details.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.