M-33/2110 10477/N

Fundamental and Atmospheric Photochemistry-333
(Semester-III)
(SYLL-DEC-2019)

[Time: Two Hours] **[Maximum Marks: 55]**

Note: Attempt any four questions. All questions carry equal marks.

1.	a) Describe photochemical degradation of excited states of Hg atom. Also explain Hg-sensitized photo reaction of propene. b) Why fine structure of electronic spectra is not observed in photochemistry? Explain the concept of integrated absorption coefficient.	7 Marks 6.75 Marks
2.	a) How the photo-fragmentation is used in photochemical synthesis of detergents and insecticides? b) Radiation of wavelength 2540A^o was passed through a cell containing 10ml of a solution 0.0495M oxalic acid and a 0.01 m uranyl sulphate. After the absorption of 8.81 x 10^3 ergs of radiation, the concentration of oxalic acid was reduced to 0.0383 M. Calculate ϕ for photochemical decomposition of oxalic acid at the given wavelength.	6.75 Marks 7 Marks
3	Write short notes on the following: a) Resonance Fluorescence b) Quenching of Fluorescence c) Spin conservation Rule d) Doppler Broadening	13.75 Marks
4.	a) Define Quantum Yield. How it is determined by using Ferrioxalate actinometer? b) Describe in detail the photophysical processes of Sulphur molecule.	6.75Marks 7 Marks
5.	a) Write the kinetic analysis and quantum yield of triplet state. b) State Laws of photochemistry? Give mathematical expression for Stark-Einstein's Law.	6.75 Marks 7 Marks
6.	What is Photochemical Smog? Discuss various reactions involved in Photochemical Smog.	13.75 Marks
7.	(a) Discuss the Spectrum of Ozone. (b)Discuss various Zones of the atmosphere with respect to temperature.	7 Marks 6.75 Marks
8.	(a) Define a pollutant. Discuss Carbon Monoxide as a Pollutant. (b) How total hydrocarbons can be determined?	7 Marks 6.75 Marks
9.	(a) What are oxidants in the atmosphere and why these are more dangerous than normal oxidants? Explain. (b) What is AQ I ? Which is good air with respect to AQ I ?	7 Marks 6.75 Marks