

<b>Name:</b>	 <b>UPES</b> UNIVERSITY WITH A PURPOSE
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**Online End Semester Examination, June 2021**

**Course: Photochemistry and Pericyclic reactions**  
**Program: M. Sc. Chemistry**  
**Course Code: CHEM7021P**

**Semester: II**  
**Time 03 hrs.**  
**Max. Marks: 100**

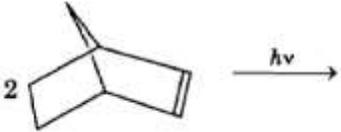
**SECTION A**

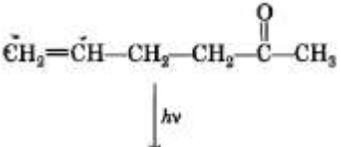
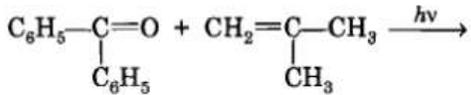
1. Each question will carry 5 marks
2. Instruction: Complete the statement/ Select the correct answer

S. No.	Question	Marks	CO
Q 1	In a spectrophotometric cell of 2.0 cm path length the solution shows an absorbance value 1.0. If molar absorptivity constant is, 20000 L/mol/cm. find the concentration of substance in the solution in mol/L.	5	CO1
Q 2	A substance absorbs $2.0 \times 10^{16}$ quanta or radiations per second and 0.002 mole of it reacts in 1200 seconds. What is the quantum yield or the reaction ( $N = 6.02 \times 10^{23}$ )?	5	CO1
Q 3	Calculate the energy of photon corresponding to wavelength 4800 angstrom.	5	CO1
Q 4	a. For triplet state, the spin multiplicity is _____. b. One Einstein energy is equivalent to _____ $h\nu$ .	2.5 2.5	CO1
Q 5	a. The quantum efficiency of a photochemical reaction is defined as _____ b. _____ phenomenon represents radiation less transitions.	2.5 2.5	CO1
Q 6	Name the approaches that have been made to explain pericyclic reaction.	5	CO3

**SECTION B**

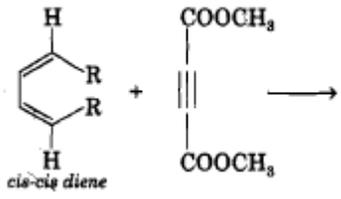
1. Each question will carry 10 marks
2. Instruction: Write short / brief notes

Q 1	Write all the possible products for the following reaction: 	10	CO2
Q 2	Write the products and steps involved in the reaction	10	CO2

			
Q 3	Derive Stern-Volmer equation for the role of quencher in photochemical reactions.	10	CO1
Q 4	Explain intermolecular Paterno Buchi reaction. Write the product for the following reaction 	10	CO2
Q 5	Write the product(s) of the following reactions 	10	CO2

### SECTION-C

1. Each question carries 20 marks
2. Instruction: Write long answers

Q 1	<p>a. Explain Cope rearrangement with example. <b>OR</b> Explain Photo-Fries rearrangement.</p> <p>b. Write the product of the following reaction:</p>  <p style="text-align: center;"><b>OR</b></p> <p>Write all the molecular orbital schematic combinations for <math>\pi</math> orbitals of 1,3-butadiene from the <math>\pi</math> molecular orbitals of ethylene.</p>	10 10	CO3
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