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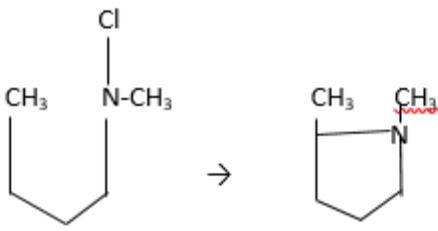
## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

**Mid Semester Examination, October 2019**

Programme Name: M. Sc. Chemistry	Semester : I
Course Name : Photochemistry and Pericyclic reactions	Time : 3 hrs
Course Code : CHEM7001	Max. Marks : 100
Nos. of page(s) :	

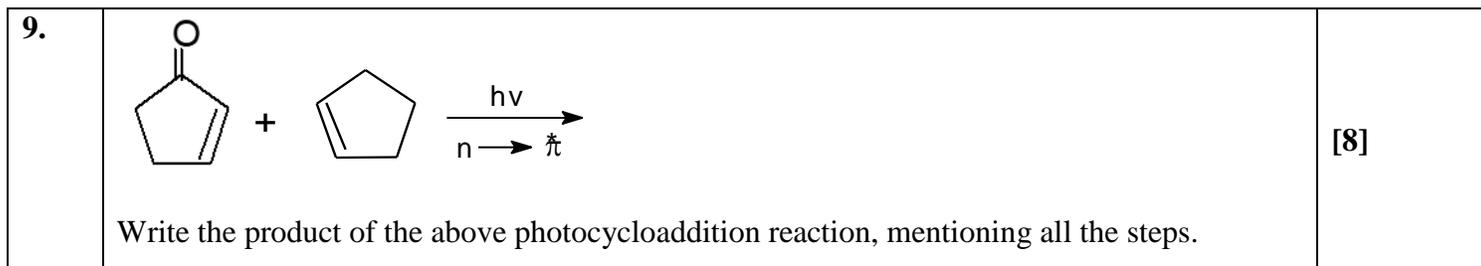
**Instructions: All the parts of a question must be solved at one place. Internal choice is given in Q8 & 12.**

### Section - A (Attempt all FIVE Questions)

1.	Differentiate regio-selectivity, site selectivity, peri selectivity, enantio selectivity and diastereo selectivity with examples.	[4]
2.	Carry out following conversion:  <div style="text-align: center;">  </div>	[4]
3. a.	Give the structural formula of the product expected by the reaction of 2,4-hexadiene and ethylene. Which reaction is this?	[2+2]
b.	Explain delayed fluorescence.	
4.	The quantum yield for the reaction $2\text{HI} \xrightarrow{\text{light}} \text{H}_2 + \text{I}_2$ is 2. Calculate the number of the photons absorbed in an experiment in which 0.01 mole of HI are decomposed. ( $N=6.02 \times 10^{23}$ ).	[4]
5.	Discuss the role of quencher in a photophysical reaction.	[4]

### SECTION - B (Attempt all FIVE Questions)

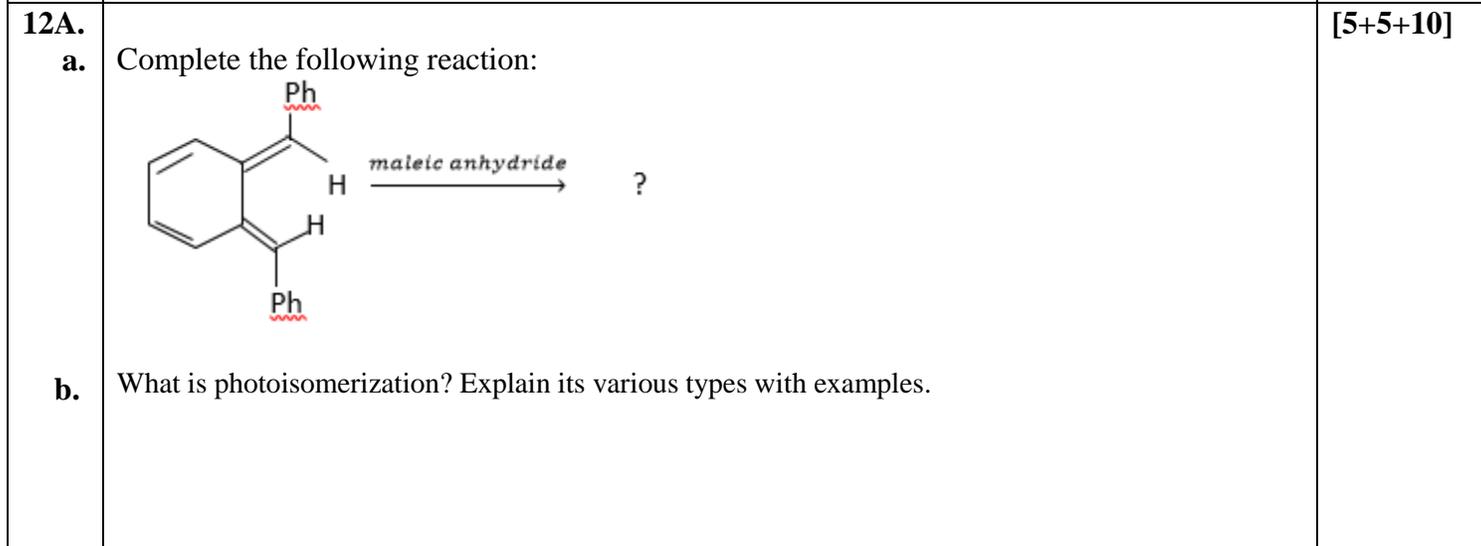
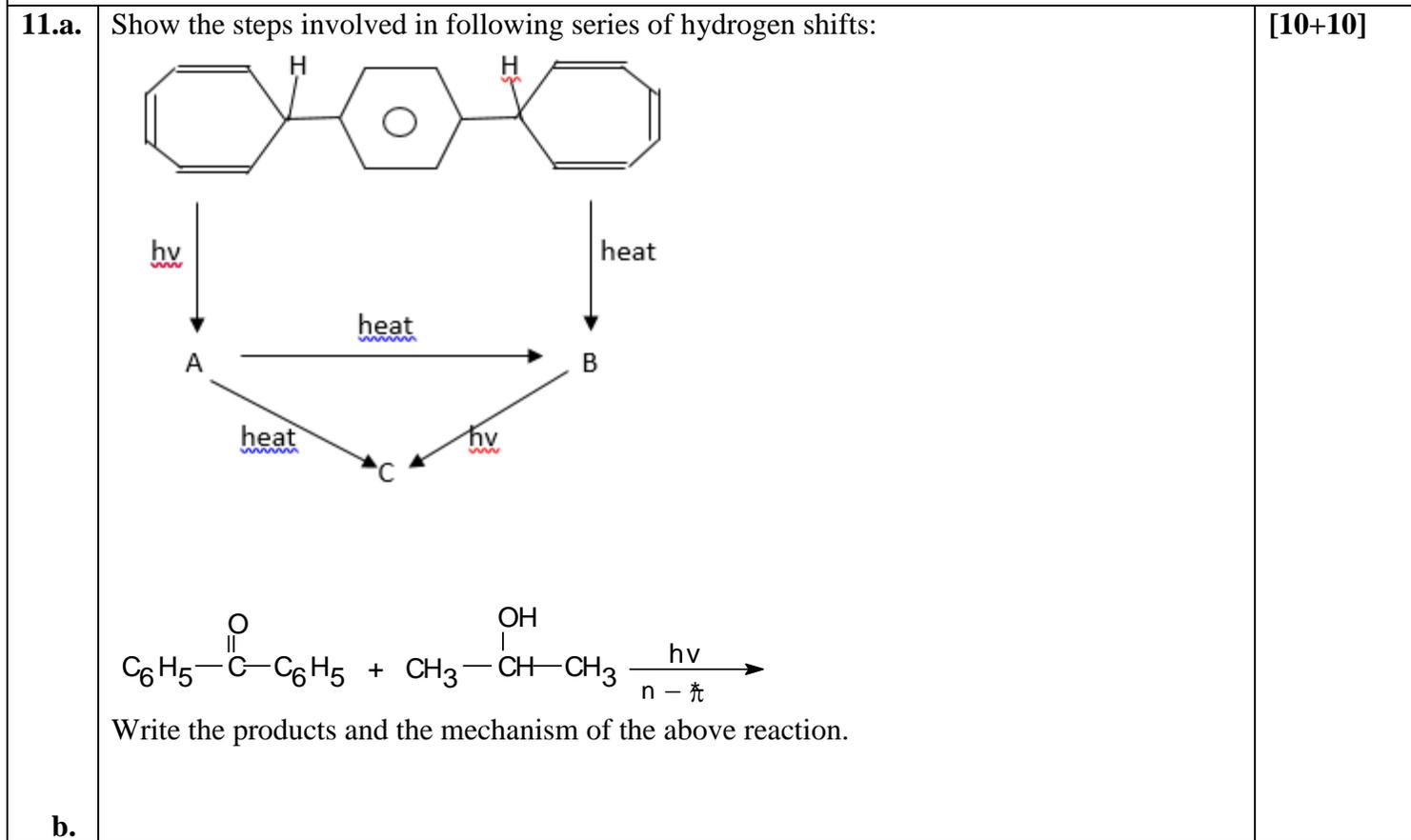
6. a.	Explain the selection rules in sigmatropic reactions to decide the stereochemistry and mode of migration.	[4+4]
b.	Explain the orbital interaction between 1,3-butadiene and ethylene via FMO method.	
7. a.	What are cycloaddition reactions? Discuss its types with examples.	[4+4]
b.	Write about the formation and decay process of an excimer.	
8.	Discuss the significance of Photo-Fries migration with suitable reaction. <div style="text-align: center;">‘OR’</div> How would you decide the stereochemistry of product in electrocyclic reactions in case of diene ring closure and triene ring closure.	[8]

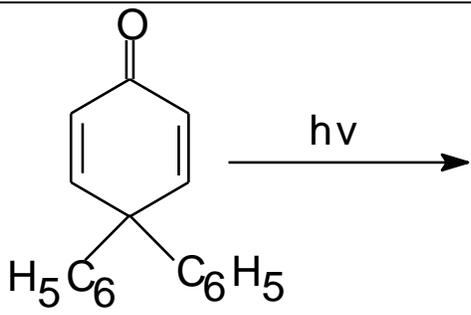
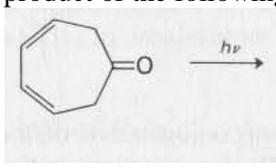
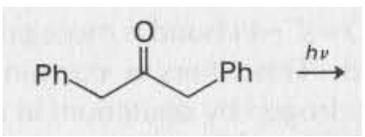


10. Explain Norrish type II reaction with example. [8]

**SECTION - C**

(Question No. 11 is Compulsory; Attempt any one from question numbers 12A & 12B)



<p>c.</p>	 <p>Write all the products of the above photo-rearrangement reaction. Mention all the steps.</p>	
<p>12B.</p>	<p>a. Explain the transformation of o-xylene to p-xylene in the presence of light.</p> <p>b. Write a note on Barton reaction with suitable chemical reaction.</p> <p>c. Suggest the product of the following reactions and explain the transformation happening there</p>  	<p>[5+5+10]</p>