

- N.B. : (1) Answer all questions.
 (2) Figures to the right indicate full marks.

1. (a) Answer any two of the following :-

(i) Complete the following reaction and explain its mechanism. 8



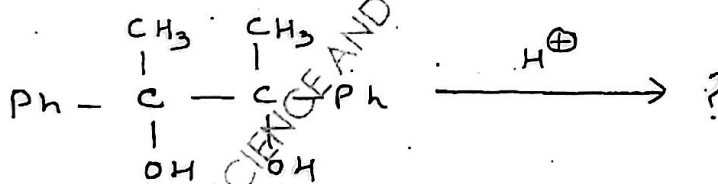
- (ii) Give stereochemical evidence for NGP reaction with a suitable example.
 (iii) Explain the role of FMO in reactions involving ambident electrophiles.
 (iv) What are pericyclic reactions? How are they classified? Give one example of each class.

(b) Answer any one of the following :- 4

(i) How is benzyne generated from aryl halide? What happens when benzyne reacts with

- (I) Anthracene
 (II) Benzoic acid
 (III) Alkyl amine

(ii) Complete the following reaction and explain its mechanism.

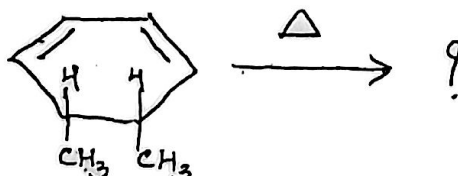


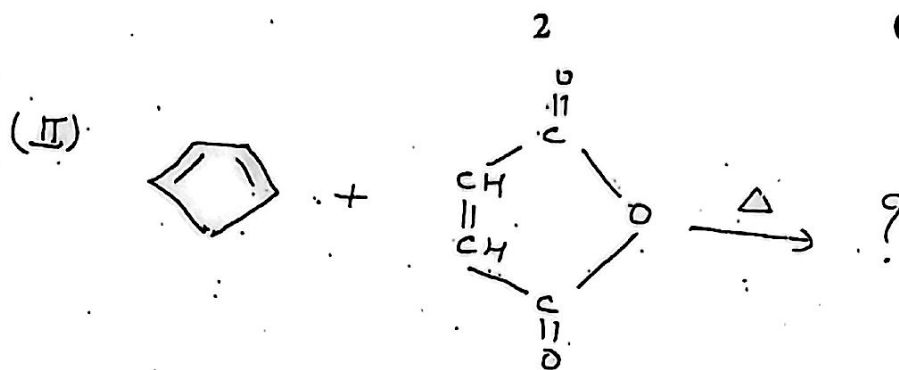
2. (a) Answer any two of the following :- 8

(i) What are electrocyclic reactions? Draw correlation diagram for disrotatory opening of cyclobutene.

(ii) Complete the following reactions :

(I)





(iii) With the help of FMO method, show that the Diels - Alder reaction is a thermally allowed process.

(iv) Give synthesis of Vitamin D from 7- dehydrocholesterol.

(b) Answer any one of the following :-

(i) What are sigmatropic rearrangements? Explain them using FMO method.

(ii) Using PMO method, discuss cycloaddition reactions involving $2\pi + 2\pi$ and $4\pi + 2\pi$ electrons.

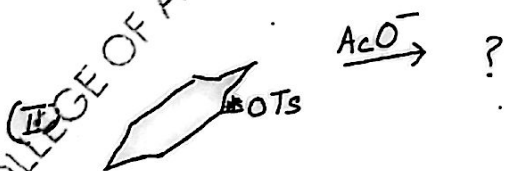
3. (a) Answer any two of the following :-

(i) The products of deamination of 2- aminocyclohexanol depend upon the conformation of substrate. Explain this observation with mechanism.

(ii) Discuss the stereochemistry of bicyclo [4.3.0] nonane.

(iii) Conformation reactivity correlation depends on selection of substrate. Explain this statement by considering conformationally mobile diastereomers.

(iv) Complete the following reactions, the mechanism and appropriate stereochemical outcome if any :-



(b) Answer any one of the following :-

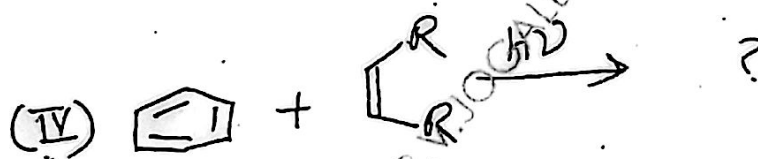
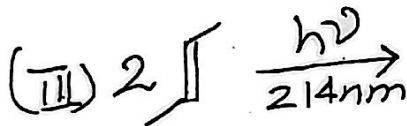
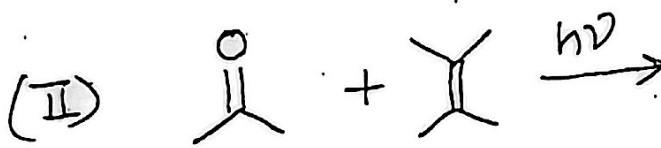
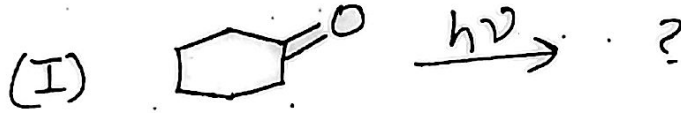
(i) Draw the conformations of cyclo-octane and discuss the evidences in favour of its most stable conformation.

(ii) "Dehydrochlorination of menthyl chloride is slower than neomenthyl chloride." Explain this observation.

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4. (a) Answer any two of the following :-

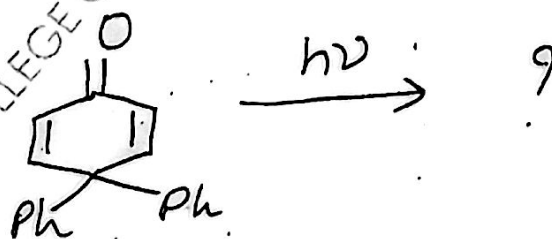
- (i) Explain with the help of a diagram the various physical processes which electronically excited molecule undergoes.
- (ii) Complete the following reactions :



(iii) Explain the following terms :

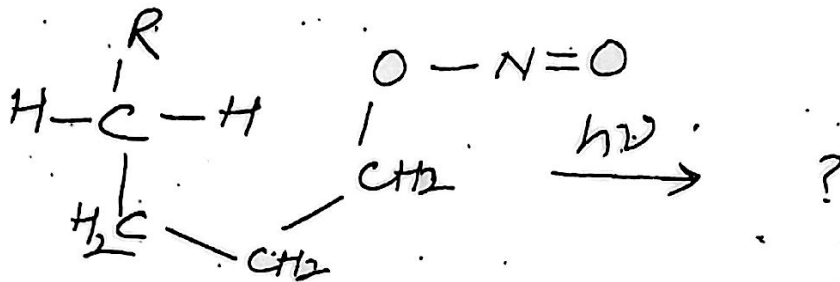
- (I) Quenching
- (II) Quantum yield.

(iv) Give the mechanism of the following reaction.



(b) Attempt any one of the following :-

(i) Complete the following reaction, give its name and suggest the mechanism : 4



(ii) Give one example and mechanism of aza-di- π methane reaction.

5. Answer any four of the following :-

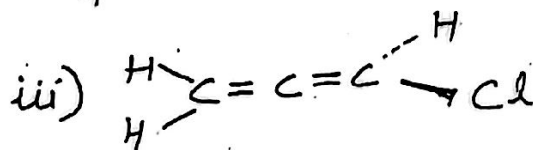
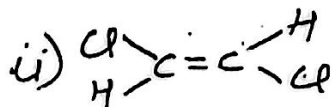
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- (a) What are 1,3-dipolar cycloadditions? Give two examples.
 (b) Write a brief note on cheletropic reactions.
 (c) Complete the following reactions :-



- (d) How is ketene generated? What is the action of the following on ketene :-
 (i) Water
 (ii) Alcohol.
 (e) Explain briefly I-strain concept.
 (f) Assign point group to the following molecules :

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- (g) Explain photo Fries rearrangement with its mechanism.
(h) Complete the following reactions :

