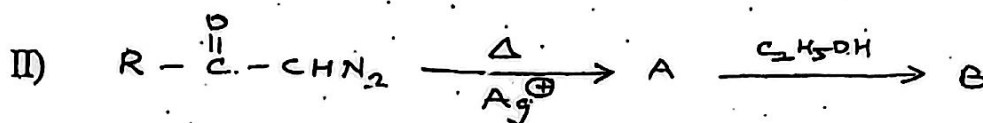
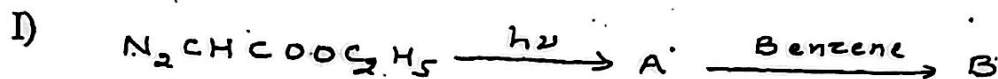


- N.B. :** (1) Answer all questions.  
 (2) Figures to the right indicate.

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

8

- i) Complete the following reactions and identify the reactive intermediate formed in each reaction:-



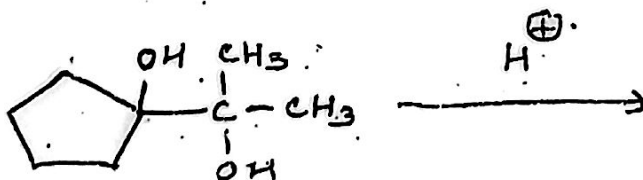
- ii) Explain the following:-

- I) Treatment of 2-bromopropanoic acid with dilute alkali results in a substitution product with retention of configuration.  
 II) The rate of acetolysis of trans-2-iodo cyclohexyl brosylate is many times faster than the acetolysis of the cis-isomer.  
 iii) Explain the role of FMO in reactions involving hard and soft nucleophiles and electrophiles.  
 iv) Draw molecular orbitals of hexa-1, 3, 5-triene and comment upon their symmetry properties.

b) Answer any one of the following:-

4

- i) Complete the following reaction and give its mechanism.



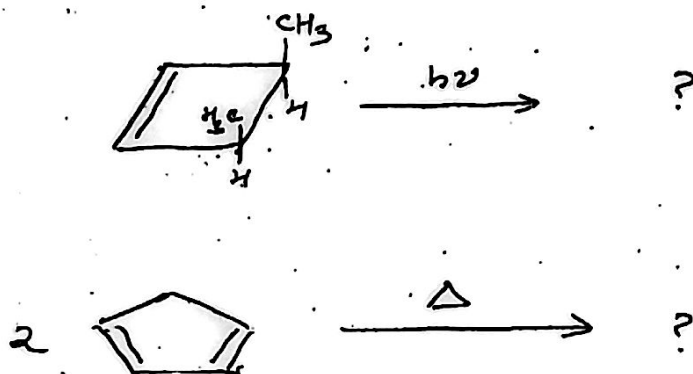
- ii) Explain mechanism of a reaction which involves ketene reactive intermediate.

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

8

- Using correlation diagram, explain whether the ring closing electrocyclic reaction of 1, 3-butadiene can take place thermally or photochemically.
- With the help of FMO method, explain sigmatropic rearrangements.
- Complete the following reactions.



iv) Give synthesis of citral using pericyclic reaction.

b) Answer any one of the following:-

4

- Show that Diels-Alder reaction is a thermally allowed process using FMO method.
- What are cheletropic reactions? Explain them giving two examples.

3. a) Attempt any two of the following:-

8

- Substituted cyclohexanols with axial - OH undergo oxidation at a faster rate than equatorial isomer. Explain with suitable example.
- Discuss the conformational features of the cyclooctane ring system.
- Illustrate Curtin Hammett principle with a suitable example.
- "Conformation reactivity correlation depends upon selection of substrate." Explain this statement with respect to single substrate with two or more conformers.

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b) Attempt any one of the following:-

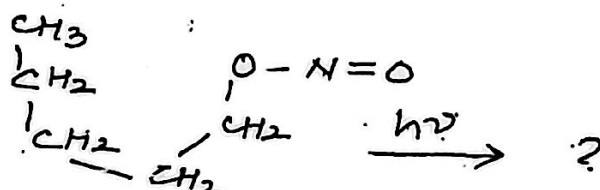
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- i) Explain any two examples of transannular reactions.
- ii) Discuss the structural features of cis and trans hydrindane.

4. a) Attempt any two of the following:-

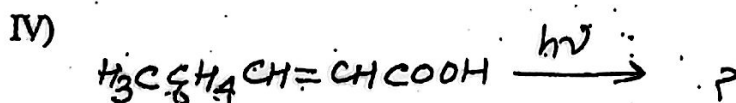
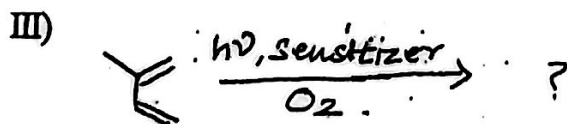
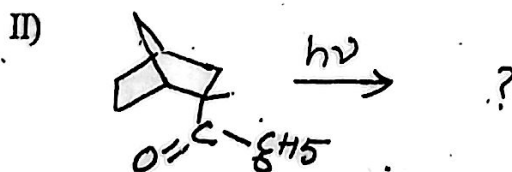
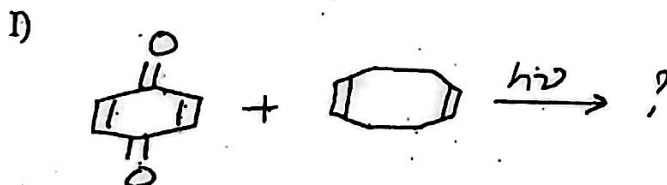
8

- i) What is meant by photosensitization? Give the mechanism, importance and two examples of photosensitizers.
- ii) Complete the following reaction. Give the name and mechanism of the reaction:



iii) What is Paterno-Buchi reaction? Give its mechanism and stereochemical consequences.

iv) Complete the following reactions:

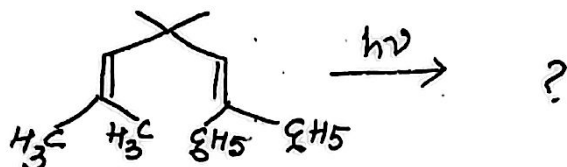


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b) Attempt any one of the following:-

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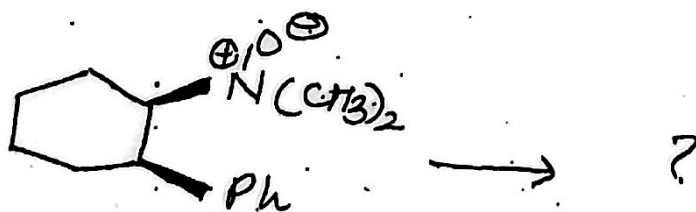
- i) Discuss the cleavage of a bond  $\beta$  to the carbonyl group in photochemical reactions of ketones with a suitable example.
- ii) Complete the following reaction and give its mechanism:



5. Answer any four of the following:-

8

- a) How is benzyne generated from phthaloyl peroxide? What is the action of following on benzyne.
  - i) Furan
  - ii) Alkyl amine?
- b) Explain mechanism of Curtius rearrangement.
- c) What are ene reactions? Give two examples.
- d) Give an account of Claisen rearrangement.
- e) Explain the stereochemistry and the formation of major product by Cope elimination of following compound:



f) Assign the point group to the following molecules.

i)  $\text{CHCl}_3$



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- 5 -

- g) Explain photo Fries rearrangement.  
h) Complete the following reactions:

