

## FACULTY OF SCIENCE

M.Sc. III-Semester Examination, November / December 2013

Subject : Organic Chemistry

Paper : I  
Conformational Analysis, Pericyclic Reactions and Enzymes

Time : 3 hours

Max. Marks : 80

Note : Answer all questions from Part-A and Part-B. Each question carries 8 marks in Part-A and 12 marks in Part-B.

## PART – A (4 x 8 = 32 Marks)

(Short Answer Type)

- 1.a) Write the conformations of di substituted cyclohexane and mention their stability order.
- b) Discuss the stereo chemistry of hydrindanes.
- 2.a) Write the molecular orbitals of ethylene and indicate their phase nodes and symmetry properties.
- b) Discuss Woodward-Hoffmann selection rules for electro cyclic reactions.
- 3.a) Explain cope rearrangement reaction with a suitable example.
- b) Write a short note on anti aromatic compounds.
- 4.a) Discuss the importance of enzymes in organic synthesis.
- b) Explain the bio synthesis of proteins.

## PART – B (4 x 12 = 48 Marks)

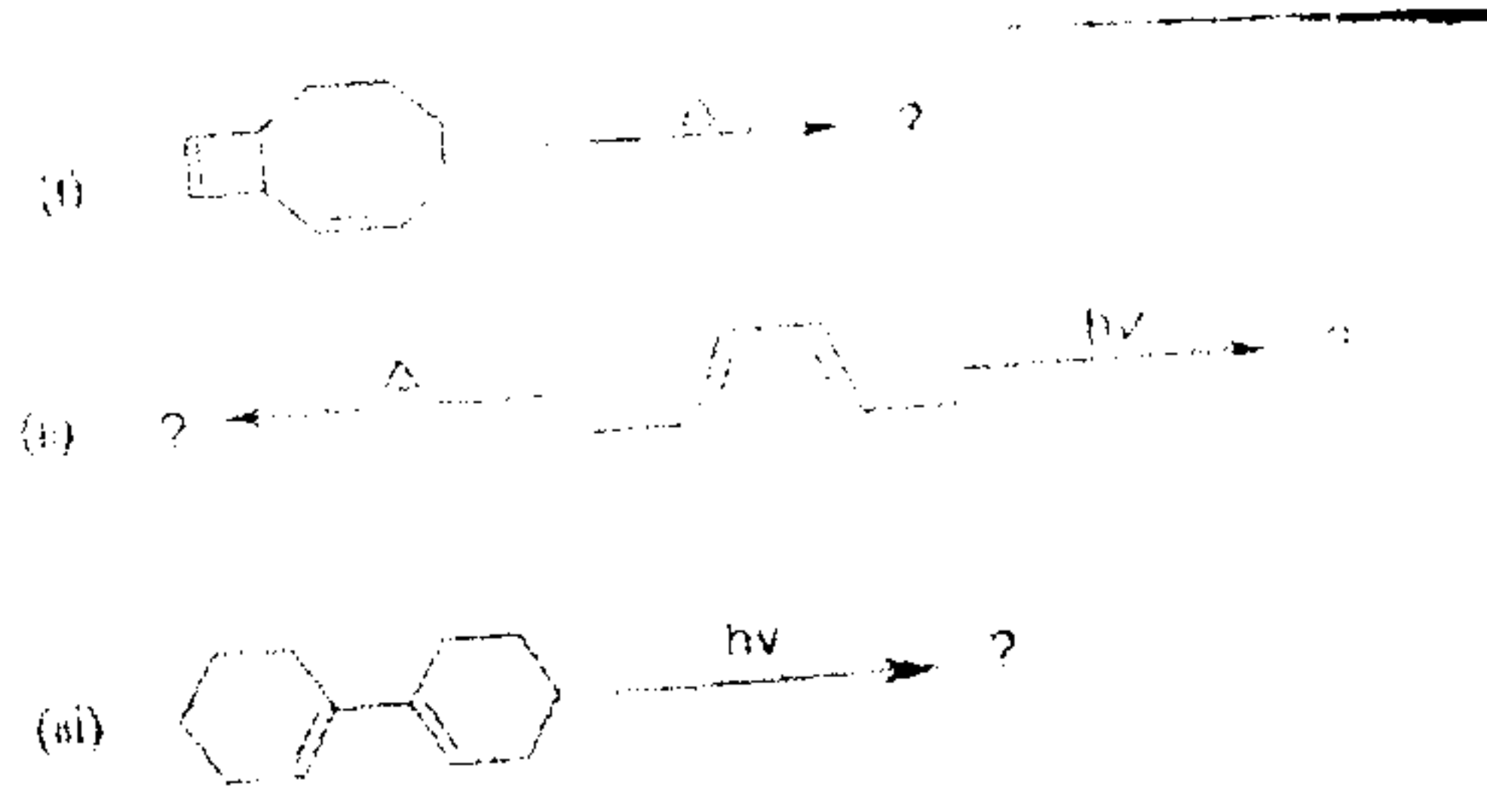
(Essay Answer Type)

- 5.a) Explain the conformational effects on the stability and reactivity of diastereomers in cyclic molecules.
  - b) Discuss the stereochemistry of decalins.
- OR
- c) What is octant rule? Write its applications to study of absolute configuration and conformation of organic molecules.
  - d) Discuss the factors governing the reactivity of axial and equatorial substituents in cyclohexanes.

- 6.a) Discuss briefly on Orbital correlation approach for electrocyclic reactions.  
b) Write the molecular orbitals of allyl radical and indicate their phase nodes and symmetry properties.

OR

- c) Complete the following reactions and give mechanism.



- 7.a) Discuss about Endo-exo selectivity in the Diels-Alder reaction using FMO theory.

- b) Explain briefly on Huckel-Mobius aromatic and antiaromatic transition state method for sigmatropic reactions.

OR

- c) Explain Diels-Alder reaction using orbital correlation diagram method.  
d) Write a note on :  
i) Huckel's  $4n+2$  electron rule for non benzenoid aromatic compounds  
ii) Annulenes

- 8.a) Explain the factors affecting the enzyme catalysis.  
b) Explain different types of RNA? Mention their role.

OR

- c) Discuss the structure of DNA.  
d) Write a note on :  
i) Lock and Key model mechanism in enzyme catalysed reactions  
ii) Biosynthesis of lipids

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