

**FACULTY OF SCIENCE**  
M.Sc. III - Semester Examinations, January 2018

**Subject: Chemistry (Organic Chemistry)**

**Paper- I**

**Synthetic Reagents, Advanced NMR, Conformational Analysis and ORD**

**Time: 3 Hours**

**Max.Marks: 80**

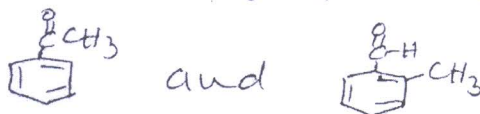
**Note: Answer all questions from part - A and part - B.**

**Each question carries 8 marks in part-A and 12 marks in part-B**

**PART-A (4x8=32 marks)**

**(Short answer type)**

- 1 (a) Discuss the protection and deprotection of 1,2-diols as acetals and ketals.  
(b) What is Rh based carbene complex? Explain its utility in cyclopropanation reaction.
- 2 (a) Explain how benzyl alcohol is oxidized by Swern method.  
(b) Explain why aniline and cyanobenzene react differently under birch reduction conditions.
- 3 (a) How do you differentiate the following compounds using SFORD spectrum.

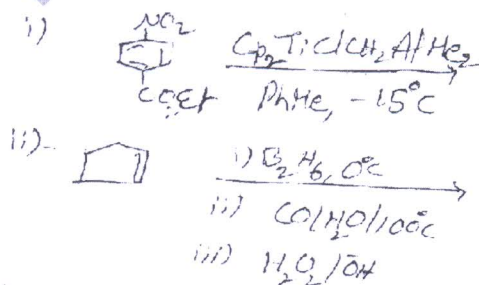


- (b) What is 2D-NMR spectrum? Give the classification of 2D-NMR experiments.
- 4 (a) Write a note on the conformational stability of polysubstituted cyclohexanes  
(b) What is Helicity rule? Explain it for Helicenes.

**PART-B (4X12=48 Marks)**

**(Essay Answer Type)**

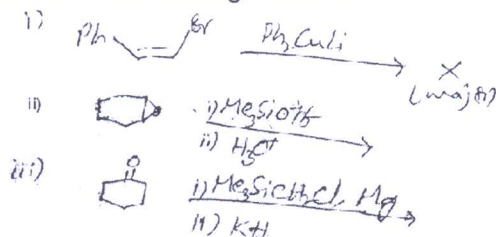
- 5 (a) Predict the product and give mechanism for each of the following reactions.



- (b) Discuss briefly the following  
i. Horner- Wadsworth- Emmons olefination

**(OR)**

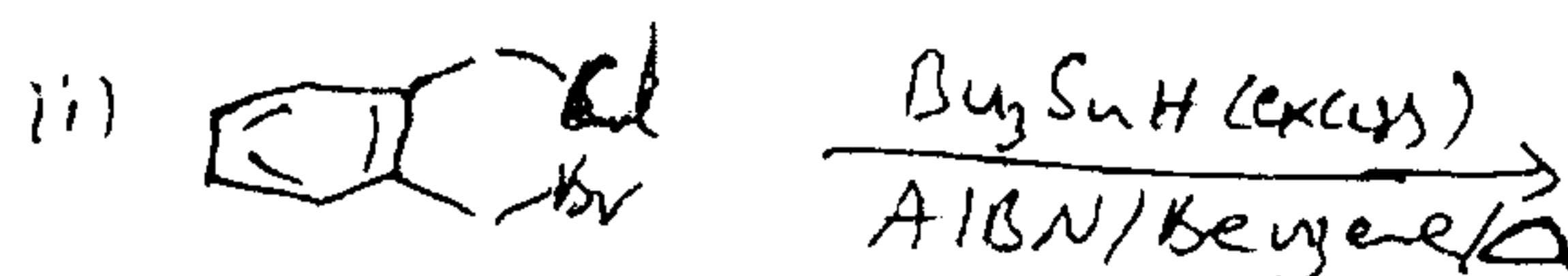
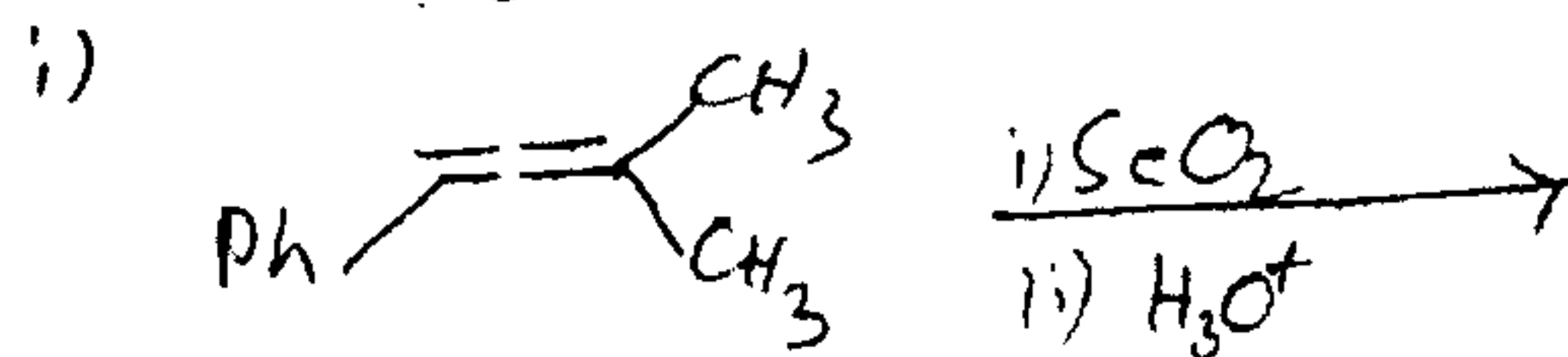
- (c) Predict the products in the following reactions



(d) Write a short note on

- Protection of amines as BOC, Cbz groups
- Preparation and applications of organolithium compounds

6 (a) Formulate the product and give mechanism for each of the following reactions.

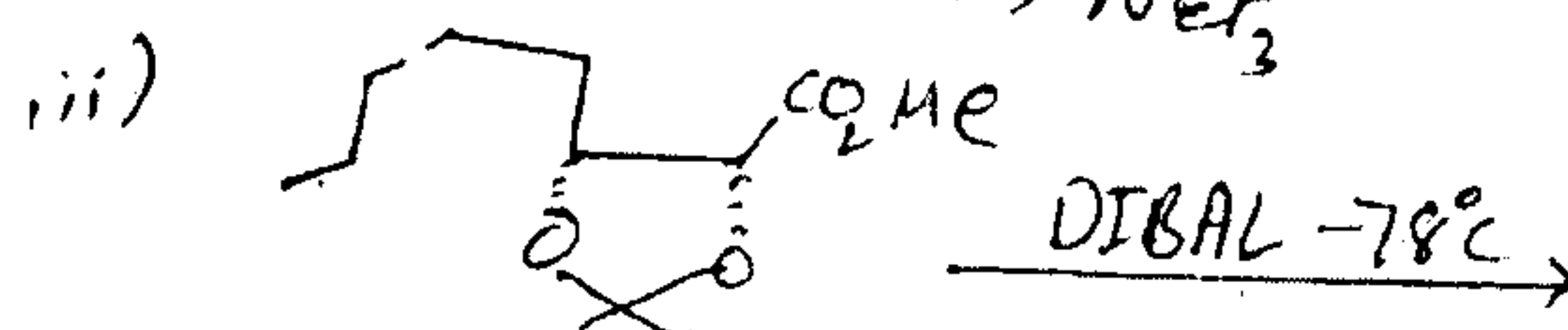
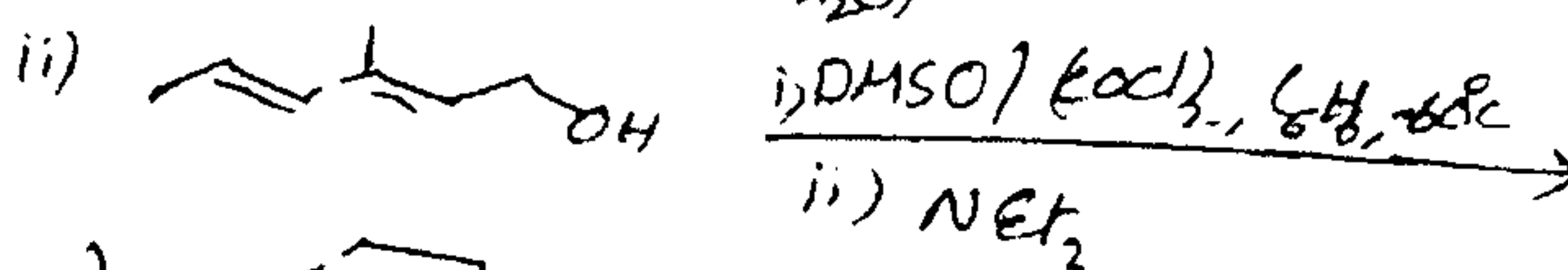
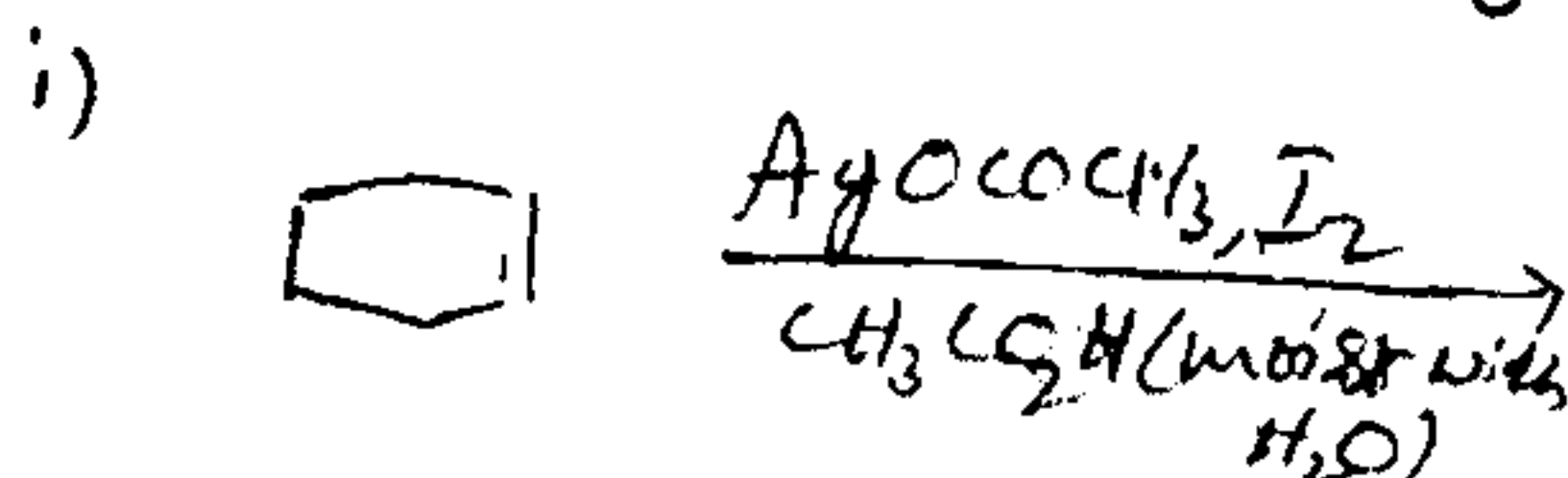


(b) Describe briefly the following

- Oxidation of alcohol with PCC.
- Applications of  $LiAlH_4$  in reduction reactions.

(OR)

(c) Predict the product in each of the following reactions



(d) Explain briefly the following

- Homogeneous catalytic hydrogenation

7 (a) Explain how the  $^{13}C$ -NMR spectroscopy is useful in determining the reaction mechanism in organic molecules.

(b) Discuss the HMQC and HMBC 2D- experiments with suitable examples.

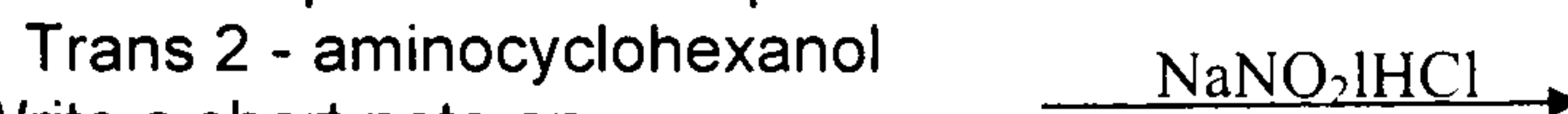
(OR)

(c) (i) Explain the principle and applications of DEPT technique

(ii) How do you differentiate n-Butanol and iso-Butanol using DEPT technique

(d) Explain the principle of Heteronuclear 2D-J resolved experiment and draw Homo Hetero 2D-J resolved spectra for 1-nitro propane.

8 (a) Predict the product and explain the mechanism for the following reaction.



(b) Write a short note on

- 3-alkylketone effect
- Plain curves and anomalous curves

(OR)

(c) Draw the conformations of tropine, tropane and pseudotropine and explain

(d) i. predict the major product of the following reaction and give reasons



ii. Write a note on axial haloketone rule.

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