

**FACULTY OF SCIENCE**  
**M.Sc. III – Semester Examination, December 2016**

**Subject: Organic Chemistry**  
**Paper – III**  
**Modern Organic Synthesis**

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 oxidative cleavage of 1,2-diols with periodic acid.  
 b) What are protecting groups? Discuss the role of protecting groups in organic synthesis. Explain the use of hydroxyl protecting groups.
  - 2 a) How will you convert  $\text{CH}_3 - \underset{\text{CH}_3}{\overset{\text{CH}_3}{\text{C}}} - \underset{\text{CH}_3}{\overset{\text{CH}_3}{\text{C}}} = \text{O}$  into  $\text{CH}_3 - \underset{\text{CH}_3}{\overset{\text{CH}_3}{\text{C}}} - \text{CH} = \text{CH}_2$  by using organo lithium compounds.  
 b) Write short notes on trimethylsilyl iodide and trimethylsilyl triflate.
  - 3 a) Give the reaction and mechanism of the reaction of sulfonyl stabilized carbanions with carbonyl compounds.  
 b) What happens when bromobenzene is treated with in presence of  $\text{Pd}(\text{OAc})_2$ ,  $\text{Ph}_3\text{P}$ ,  $(\text{Et})_3\text{N}$ . Give the product and write the mechanism.
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- 4 a) Explain the Chiron approach in the organic synthesis with suitable example.  
 b) What is Felkin-Anh model? Explain.

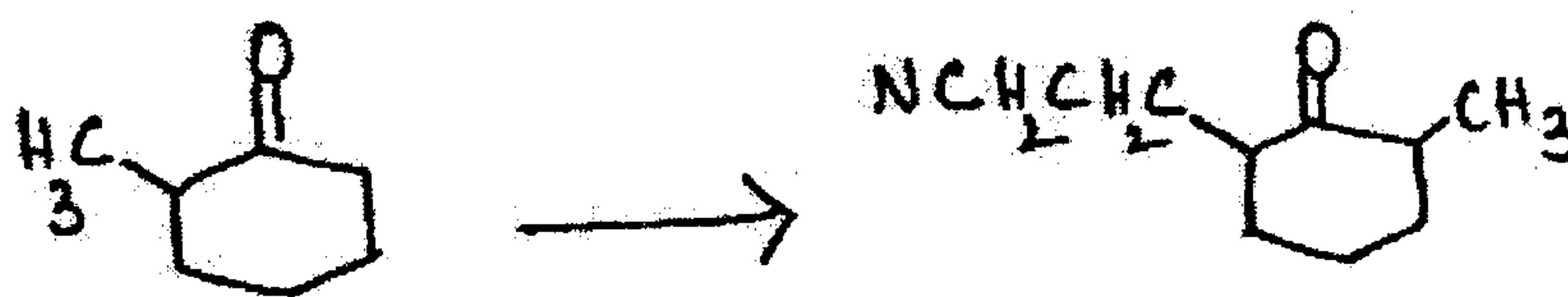
**PART – B (4x12 = 48 Marks)**  
**[Essay Answer Type]**

- 5 a) What is Birch reagent? Give any four applications of it.  
 b) What is NBS? Give its importance in-organic synthesis through a reaction and discuss its mechanism.
- OR**
- c) Write short notes on the following:
    - i) Perost oxidation
    - ii) Swern oxidation
  - d) Explain the importance of PCC and  $\text{Ag}_2\text{CO}_3$  in the organic synthesis with any four applications.

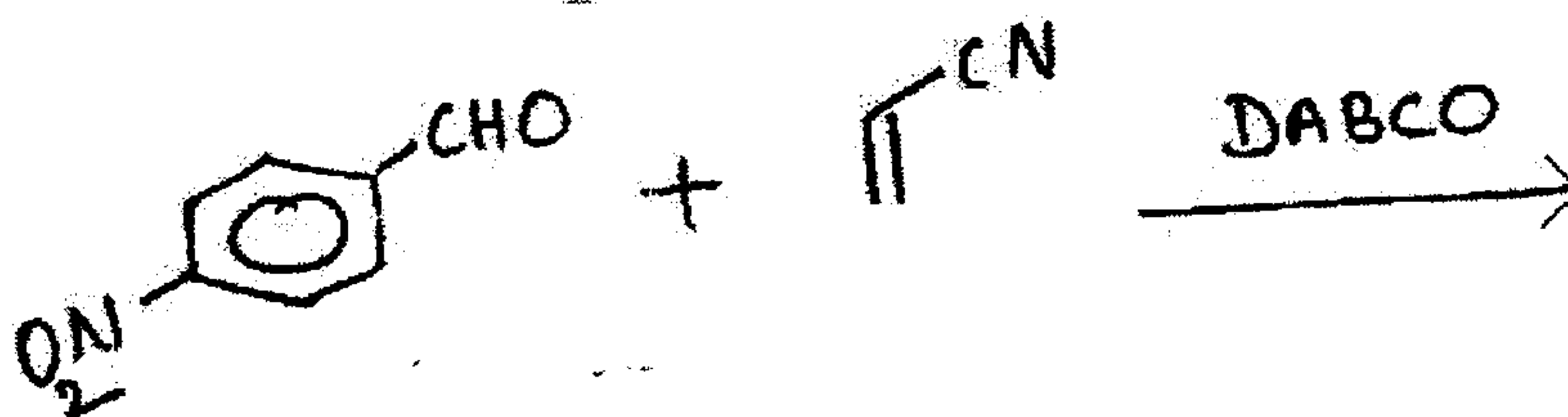
- 6 a) Give any four applications of organo copper reagents.  
 b) Write short notes on reactions involving  $\beta$ -carbocation of organo silicon compounds.

OR

- c) How do you convert using Stork – Enamine reaction?



- d) What is umpolung? Explain the umpolung importance in organic synthesis with suitable examples.
- 7 a) Write short notes on:  
 i) Buchwald – Hartwig coupling  
 ii) Ugi reaction  
 b) What is Mc Murrey reaction? Give its mechanism.  
 OR  
 c) Complete the following and give mechanism



- d) Explain the use of BINAL and BINAP reagents in organic synthesis using suitable examples.
- 8 a) How do you determine the absolute configuration using Mosher's method.  
 b) Write the solid phase oligonucleotide synthesis.

OR

- c) What is phase transfer catalysis? Explain the applications of PTC.  
 d) Write the Tandem synthesis with suitable examples in conjugate addition aldol reaction and electrocyclic-Diels – Alder reaction.

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