



NATIONAL OPEN UNIVERSITY OF NIGERIA
 PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
OCTOBER 2022 EXAMINATION

COURSE CODE: CHM 421

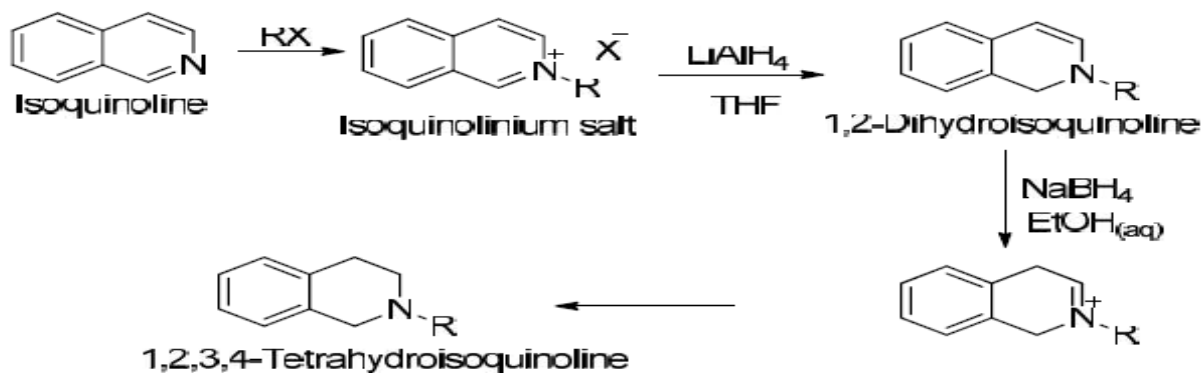
CREDIT: 2 Units

COURSE TITLE: HETEROCYCLIC CHEMISTRY **TIME ALLOWED: 2 Hours**

INSTRUCTION: Answer Question ONE (1) and any other Two (2) Questions

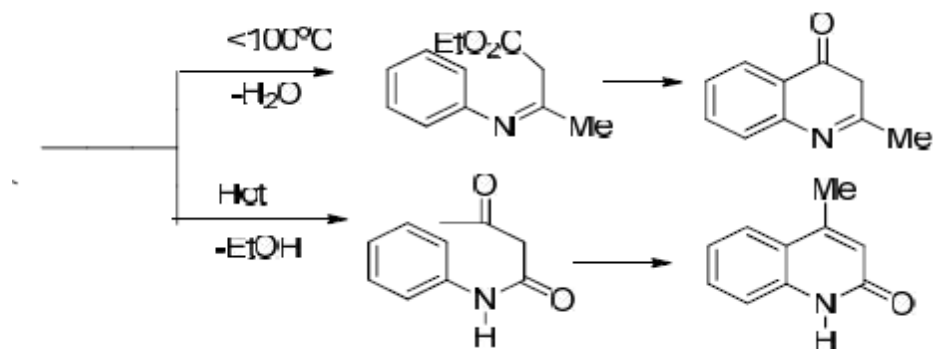
QUESTION ONE

- a. Give a brief description of Döbner-von Miller Synthesis **[6 marks]**
- b. Draw the structure of Quinine showing four asymmetric centres **[10 marks]**
- c. Highlight on the appearance, solubility, basic nature and modification tendencies of Isoquinoline **[7 Marks]**
- d. A structural reaction equation showing reduction of Isoquinoline is given below; carefully analyze this equation **[7 Marks]**



QUESTION TWO

- a. Discuss the reaction of Quinoline with Potassamide under the Chichibabin type reaction **[13 marks]**
- b. List the vital compounds require for synthesis of quinoline using Skroup method **[4 Marks]**
- c. The equation for Conrad-Limpach Synthesis of Quinolone is provided below. You are required to provide the missing reactant **[3 Marks]**



QUESTION THREE

Using adequate structural equations, discuss the Friedländer Synthesis and give emphasis on the Variation of Friedländer Synthesis [20 Marks]

QUESTION FOUR

- List three major methods of synthesis of Isoquinoline [6 Marks]
- Isoquinoline is a benzopyridine. Discuss. [8 Marks]
- Isoquinoline is used as an anesthetic drug, example of such is 'Dimethisoquine' Give the structure of this drug [6 Marks]

QUESTION FIVE

- β -phenylethylamine is a precursor for synthesis of isoquinoline in the Bischler-Napieralski Synthesis. Explain the process for synthesizing this compound [11 Marks]
- Phenols and 1,3-dicarbonyl compound are used as starting materials for the synthesis of the three-ring system. Mention with structures 2 products of this synthesis [9 Marks]