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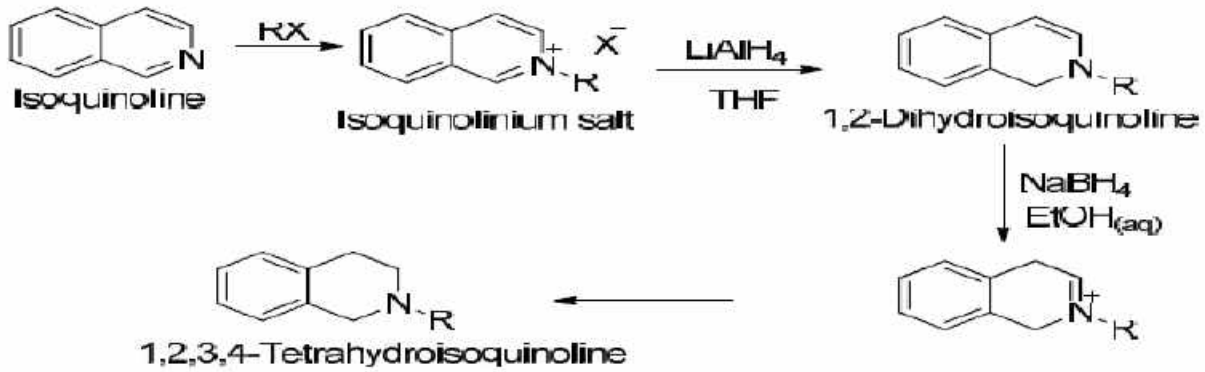
NATIONAL OPEN UNVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
OCTOBER 2022 EXAMINATION

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]**

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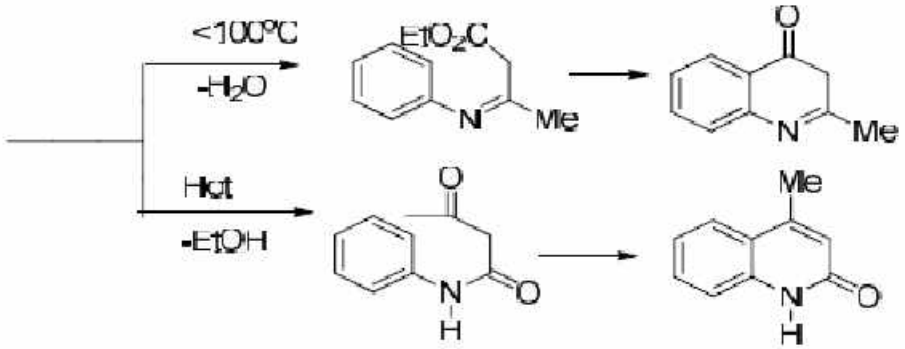

QUESTION THREE

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

QUESTION FOUR

a. List three major methods of synthesis of Isoquinoline **[6 Marks]**

b. Isoquinoline is a benzopyridine. Discuss. **[8 Marks]**

c. Isoquinoline is use as an anesthetic drug, example of such is 'Dimethisoquine' Give the structure of this drug **[6 Marks]**

QUESTION FIVE

a. β-phenylethylamine is a precussor for synthesis of isoquinoline in the Bischler-Napieralski Synthesis. Explain the process for synthesizing this compound **[11 Marks]**

a. 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]**