



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI – ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
2020_2 EXAMINATION

COURSE CODE: CHM 421

CREDIT: 2 Units

COURSE TITLE: HETEROCYCLIC CHEMISTRY

TIME ALLOWED: 2 Hours

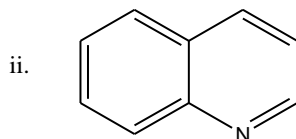
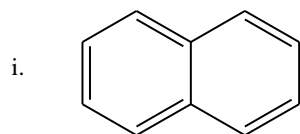
INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions

1. a. Mention three substances derived from quinolines.

[3 marks]

b. Give the name of the following structures;

[2 marks]



c. What is the essential medicinal use of nicotinic acid?

[2 marks]

d. Name the five synthetic methods for quinoline

[5 marks]

e. Outline four applications of chloroquine

[8 marks]

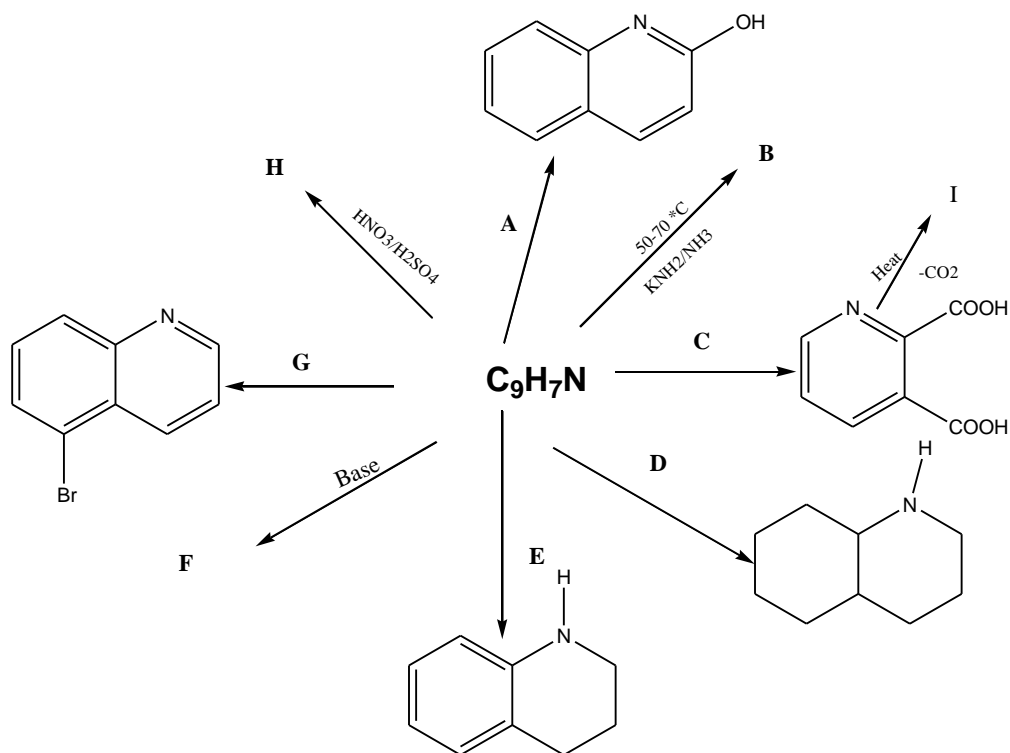
f. What is heterocyclic chemistry

[3 marks]

g. Name the heterocyclic compound that is used in photochemistry as fluorescence standard

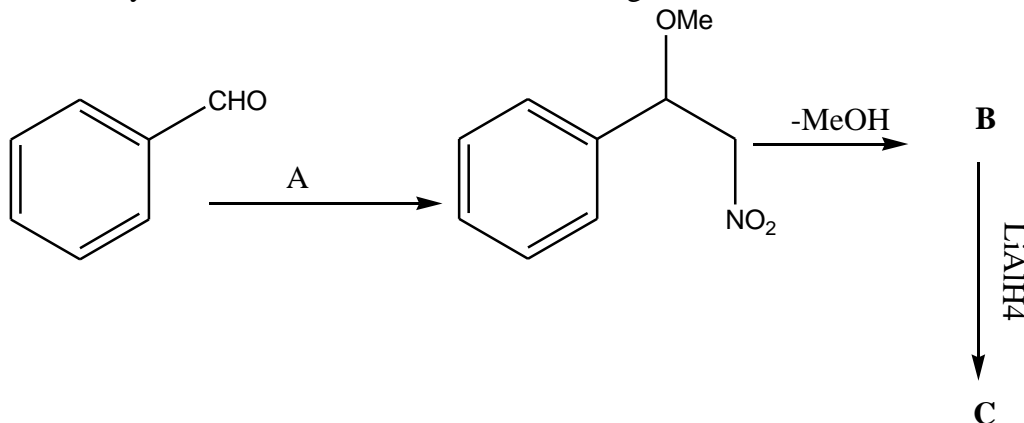
[2 marks]

2. Use the scheme below to answer the questions that follows;



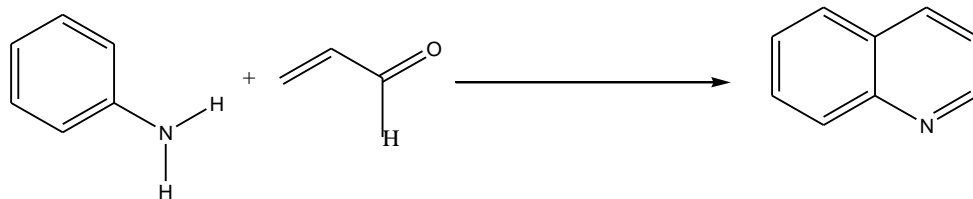
- a. i. Write the structural formula for C_9H_7N [2 marks]
 ii. Identify letters A to I [2 marks each]
- b. What is the name of the process in the following conversion; [1 mark each]
 i. at C
 ii. at D
 iii. C_9H_7N to H
 iv. at A
 v. the formation of I

3. a. i. Name the five synthetic methods for quinolines [5 marks]
 b. Identify the letters A, B and C in the following reactions; [5 marks]



- c. What are the five main medicinal applications of quinine? [5 marks]

4. a. Show the steps involved in the following reactions; [7 marks]



- b. i. Name the heterocyclic compound that has anti-fungal properties **[2 marks]**
 ii. . Outline three medicinal agents containing the benzothiophene structure and their uses **[6 marks]**
5. a. Starting from suitable aldehydes and ketone, Outline the synthesis of:
 i. Acetylbenzofuran **[5 marks]**
 ii. Acetylbenzothiophene **[5 marks]**
- b. List any two heterocyclic compounds that are alkaloids in nature **[5 marks]**