



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
SEPTEMBER, 2020_1 EXAMINATION QUESTIONS

CHM 421: HETERO CYCLIC CHEMISTRY
CREDIT UNIT: 2

Instruction: answer question 1 and any other three questions

QUESTION 1

- a. List five physical properties of Quinoline. [5 marks]
- b. i. Outline the synthesis of nicotinic acid from quinoline. [10 marks]
ii. What is the product of the reaction of chromone with hydrochloric acid? [3 marks]
- c. Write an equation for the reaction of benzofuran with nitric acid in acetic acid [7 marks]

QUESTION 2

- a. Outline the synthesis of chloroquine via the Conrad-Limpach synthesis [10 marks]
- b. Draw the structures of the following;
i. Dimethisoquine ii. Benzofuran iii. Papaverine iv. Chloroquine v. Benzothiophene
[5 marks]

QUESTION 3

- a. Explain why nitration of quinoline with acetyl nitrate yields 3-nitroquinoline, while nitration with fuming nitric acid and sulphuric acid yields 5 and 8-nitroquinoline. Write the equations for the reaction [10 marks]
- b. Write briefly on two medicinal agents containing the quinoline nucleus. [5 marks]

QUESTION 4

- a. Starting from aniline and glycerol, show the synthesis of quinoline [10 marks]
- b. What are the physical properties of indoles? [5 marks]

QUESTION 5

- a. Devise a synthesis of 1-benzyl-1,2,3,4-tetrahydroquinoline from quinoline. [10 marks]
- b. Explain why chromone is more basic compared to coumarin. [5 marks]