



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
JANUARY 2018 EXAMINATION QUESTIONS

CHM421: HETEROCYCLIC CHEMISTRY
CREDIT : 2 Unit

TIME: 2 HOURS

INSTRUCTION: ANSWER QUESTION ONE & ANY OTHER THREE QUESTIONS.

QUESTION 1

(a) Write the equation for reaction of quinoline with the following:

- | | | |
|-------|---|-----------|
| (i) | Potassamide | (3marks) |
| (ii) | Fuming Nitric acid in concentrated Sulphuric acid | (3 marks) |
| (iii) | Acetyl Nitrate | (2 marks) |
| (iv) | Acyl and Alkyl halide | (3 marks) |
| (v) | Potassium cyanide | (3 marks) |

(b)

(i) Identify the problem of Friedlaender synthesis and suggest how it can be overcome.

(5 marks)

(ii). Write short note on Vilsmeier formylation and Mannish reaction of indole. (4 marks)

c. Give short description of warfarin and discuss its uses. (2 marks)

QUESTION 2

(a) Isoquinolines react with several electrophiles discuss and support your answers with reaction structures and equations. (10 marks)

(b) Write on the history of synthesis and isolation of Isoquinoline. (5 marks)

QUESTION 3

(a) Write short note on Indole (7 marks)

(b) Describe how the C-2 of indole will undergo Lithiation. (8 marks)

QUESTION 4

(a) Show how Indoline can be prepared by reduction of indole under birch condition. (4 marks)

(b)

(ii) Compare between Benzofuran and Benzothiophene (3 marks)

(i) List four methods by which indole can be synthesized. (4 mark)

(c) Give the structure of Sertaconazole . (4 marks)

QUESTION 5

(a) Give the structure of the following:

(i) coumarine (2 marks)

(ii) chromone (2 marks)

(b) Write short note on the properties of coumarine (3 marks)

(c) Give the structure of the following:

(iii) Benzopyrylium (2 marks)

(iv) Flavylum (2 marks)

(v) Flavone (2 marks)

(vi) Isoflavone (2 marks)