

UNIVERSITY OF ESWATINI



Final Examination– 2020

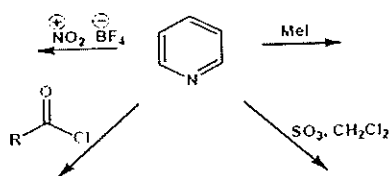
TITLE OF PAPER:	Heterocyclic Chemistry
COURSE NUMBER:	CHE 431
TIME ALLOWED:	Three Hours

INSTRUCTIONS:

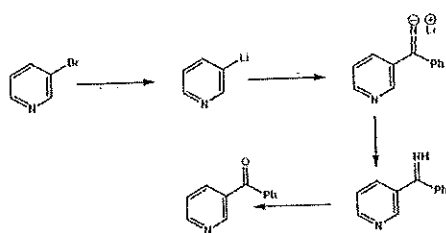
Answer any four (4) questions of the six (6) questions and every question holds 25 marks.
NB: all questions are to be answered in a separate answer sheet.

Question 1

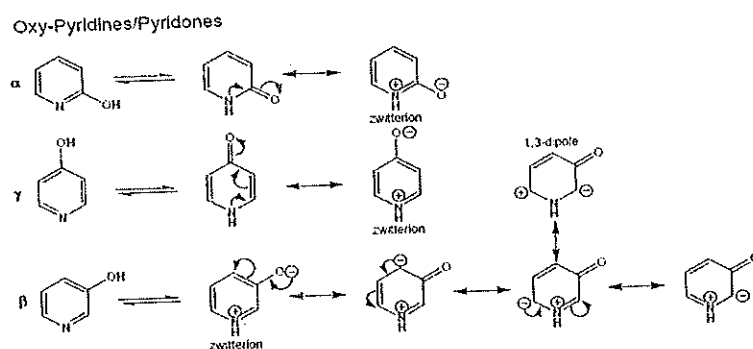
- a) Determine the reaction products of pyridine. (11)



- b) What are the reaction reagents of the metallated pyridines reactions? (6)

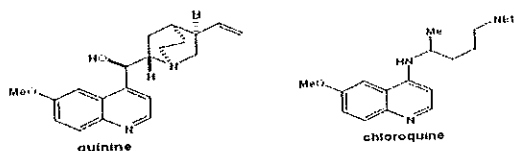


- b) What is the main reason that the reaction rate of α , γ , and β oxy pyridine/ pyridones differs? Explain using the scheme below. (8)

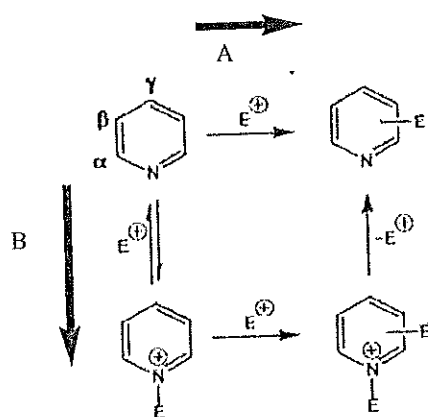


Question 2

- a) The following bioactive compounds were used in medicinal use. What were these compounds used for and to what class of natural products these compounds belong? (6)



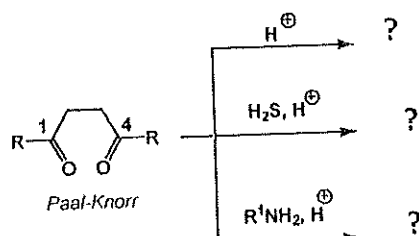
- b) Show the skrap synthesis of quinolone using (3+3) synthesis strategy. (6)
 c) Which of the two reactions A and B is very common and of high yield? Why? (8)



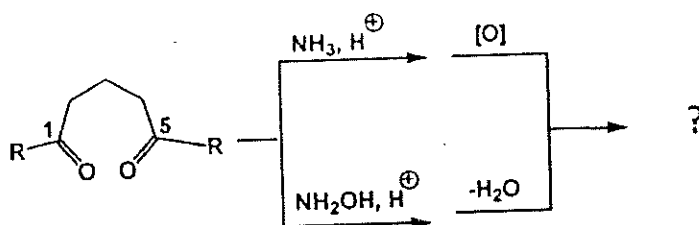
- d) Which is more reactive between pyridine and imidazole? (5)

Question 3

- a) Complete the following synthesis reactions. (9)

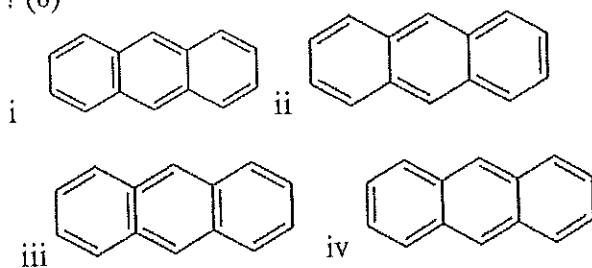


b) Complete the following reaction of 1,5 diketone reaction. (6)

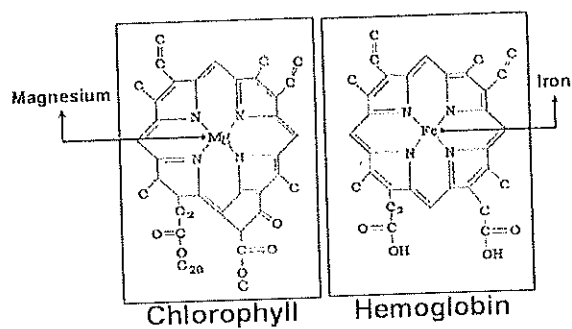


Question 4

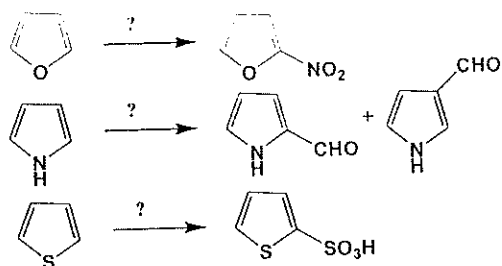
a) Which of the following structures is not a resonance contributor of Anthracene? Why? (8)



b) What are the roles of these heterocyclic compounds in life and what similarities do you see in their chemical composition and action? (8)

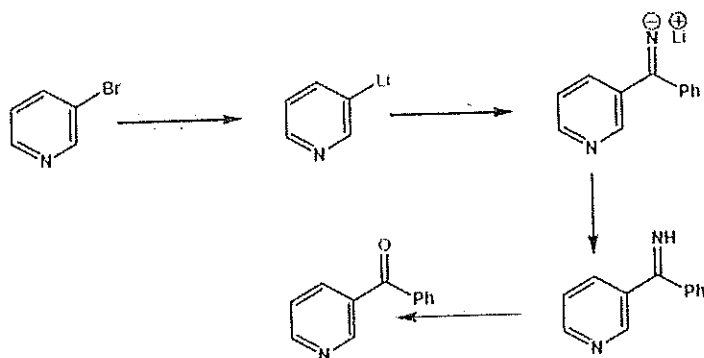


c) Fill the missing reagents in the following reaction scheme (9)

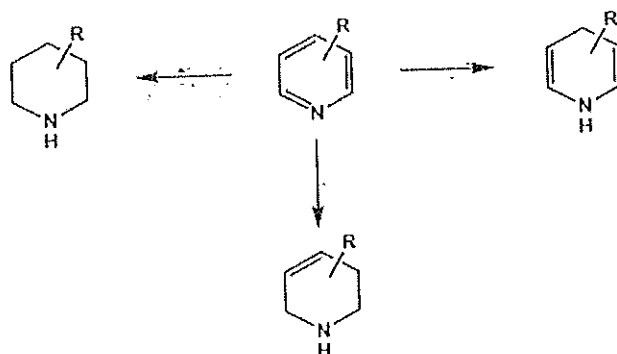


Question 5

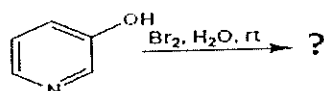
a) What are the reactants and / or reagents used for the following metallated pyridine reactions? (10)



b) What are the reagents and reaction conditions in the following reduction scheme? (9)

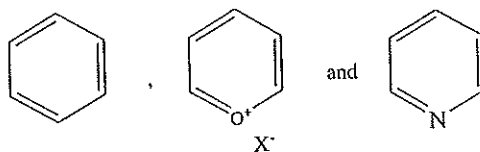


c) Where will substitution take place in the following reaction? Why? (6)



Question 6

- b) Discuss “2+3” and “3+3” Strategies in heterocyclic synthesis giving oxygen nitrogen heterocyclic compounds as examples. (9)
- c) Compare and discuss the reactivity of the following heterocyclic compounds taking benzene as the frame of reference. (10)



- d) Compare the heterocyclic compounds Pyrrole, Furan and Thiophene with their saturated forms pyrrolidine, THF, and THT. Use reactivity for your comparisons. (6)

