DEPARTMENT OF CHEMISTRY
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITY OF LAMPUNG

QUIZ

Course Identity		Exam Participant Identity	
Course Name	Organic Chemistry 3	Student name	
Course Code	KIM622202	SIN (NPM)	
Credits	3 (3 - 0)	Signature	
Time	Fri/14-9-2024 (09.00-10.40)		

Instruction :

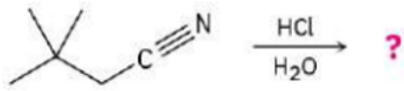
1. Fill in your identity on the answer sheet provided
2. Time to do questions 100 minutes
3. The questions consist of 5
4. Check and read the questions before you answer them
5. Report to the exam supervisor if there are questions that are unclear, damaged, or incomplete
6. Check your work before submitting it to the exam proctor
7. Assessment techniques
   a. Answer the correct score to the question
   b. Question descriptions include how to score
   c. Total overall exam score: 100

(If necessary add constants, atomic numbers etc. according to the problem)

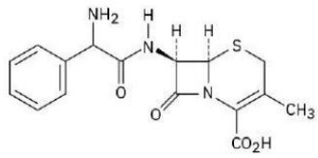
QUESTION.

1. Pregabalin, marketed as Lyrica, is an anticonvulsant drug that is also effective in treating chronic pain. The IUPAC name of pregabalin is (S)-3-(aminomethyl)-5-methylhexanoic acid. (An aminomethyl group is $–CH_2NH_2$.) Draw the structure of pregabalin

2. Acid-catalyzed hydrolysis of a nitrile to give a carboxylic acid occurs by initial protonation of the nitrogen atom, followed by nucleophilic addition of water.
(a) Review the mechanism of base-catalyzed nitrile hydrolysis and then
(b) Predict the products for the following reactions.
(c) Write the steps involved in the acid-catalyzed reaction, using curved arrows

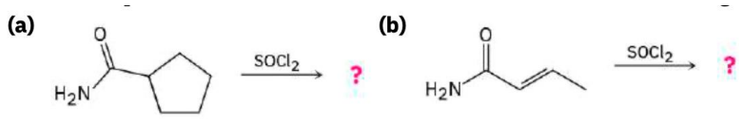


3. Closely related to the penicillins are the cephalosporins, a group of β-lactam antibiotics that contain an unsaturated, six-membered, sulfur-containing ring. Cephalexin, marketed under the trade name Keflex, is an example. Cephalosporins generally have much greater antibacterial activity than penicillins, particularly against resistant strains of bacteria.
(a) Name and indicate the functional groups of the carboxylic acid derivative in Cephalexin
(b) Predict the products formed when Cephalexin subjected to hydrolysis reaction in acid

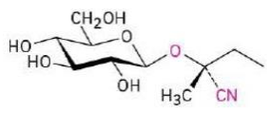


Cephalexin
(a cephalosporin)

4. Predict the product(s) and write the mechanism of each of the following reactions:



5. Naturally occurring compounds called cyanogenic glycosides, such as lotaustralin, release hydrogen cyanide, HCN, when treated with aqueous acid. There action occurs by hydrolysis of the acetal linkage to form a cyanohydrin, which then expels HCN and gives a carbonyl compound.
   a. Show the mechanism of the acetal hydrolysis and the structure of the cyanohydrin that results.
   b. Propose a mechanism for the loss of HCN, and show the structure of the carbonyl compound that forms.



Lotaustralin

== GOOD LUCK ==