



KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2016/2017 ACADEMIC YEAR**

**THIRD YEAR SECOND SEMESTER
SPECIAL EXAMINATIONS**

FOR THE DEGREE OF B.ED (SCIENCE)

COURSE CODE: SCH 332

COURSE TITLE: ALICYCLIC AND HETEROCYCLIC CHEMISTRY

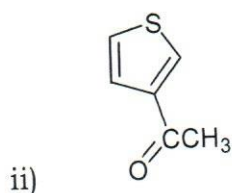
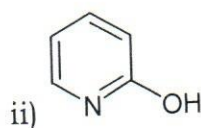
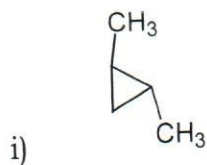
DURATION: 2 HOURS

DATE: 15/10/2018 TIME: 3-5PM

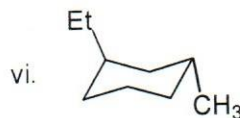
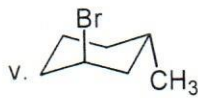
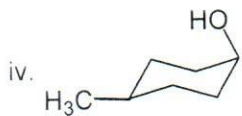
SECTION A (Answer question one)

QUESTION ONE

- a) How will you distinguish between cyclopropane and propene. (2 marks)
- b) Outline the synthesis of cyclohexane carboxylic acid from cyclohexane.. (3 marks)
- c) Name the following compounds



- d) i) Name and Draw two conformations of cyclohexane. (2 marks)
- ii) Explain the difference in the stabilities between the two conformers in d(i) above. (2 marks)
- e) State the Cis/trans configurations of the following molecules. (6 marks)

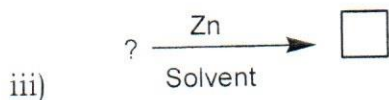
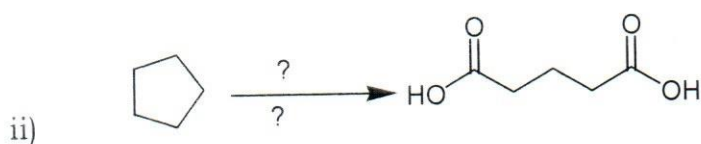
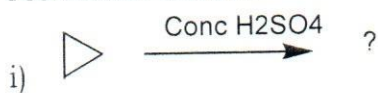


- f) With reasons, compare the reactivity of methylcyclohexane with methylcyclopropane.. (4 marks)
- g) I) What is the importance of alkaloids? Any four. (4 marks)
- II) Write chemical equations for the reaction of Furan with
- (A) acetyl chloride and Aluminium chloride.
- (B) Concentrated sulfuric acid.
- (C) Hydrogen on Nickel
- h) How will you distinguish between pyrrole and aniline?

SECTION B: Answer any TWO questions.

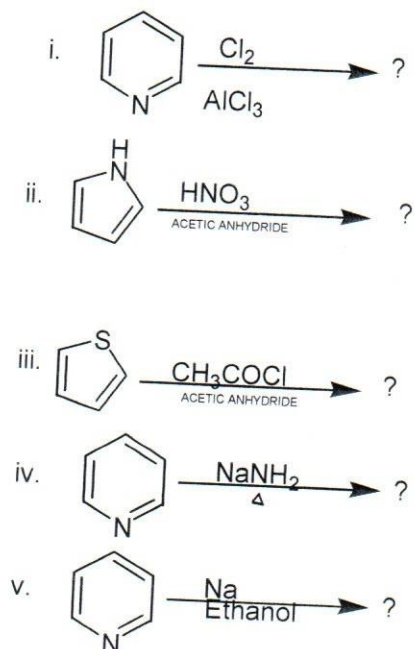
QUESTION TWO.

- a) Give all the products, starting reactants or other reagents for the reactions below. (3marks)



- b) Starting with an appropriate dicarboxylic acid salt, outline the synthesis of cyclopentane. (3 marks)
- c) Determine the products of the following reactions and give

names of the major organic products.

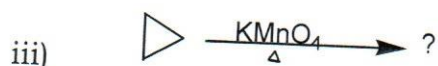
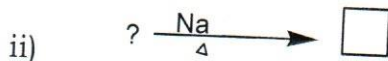


d) Give a mechanism for the reaction in 2©(iv) above. (10 marks)

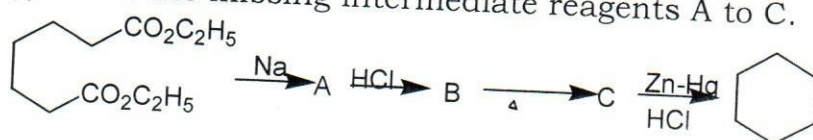
(4 marks)

QUESTION THREE

a) Identify the missing reagents in the reactions below. (4 marks)



b) Below is a reaction scheme for the synthesis of cyclohexane
(i) insert the missing intermediate reagents A to C. (3 marks)



- c) i) Outline the synthesis of 2-methylquinoline from ceniline. (4 marks)
- ii) Write equations for the reaction of quinoline with the following reagents
- I. H_2/pt at 140°C . (5 marks)
 - II. NaNH_2
 - III. $\text{H}_2\text{SO}_4(\text{C})$
 - IV. HBr
- iii) State FOUR uses of quinoline. (4 marks)

QUESTION FOUR

- a) i) What are alkaloids? (1 mark)
- ii) State any FIVE classes of alkaloids (5 marks)
- b) Nicotine is the chief alkaloid of a tobacco plant
- j) Describe its isolation from plant extracts. (8 marks)
- c) Starting with 3-cyanopyridine, give an outline for the synthesis of nicotine. (6 marks)