



ELIZADE UNIVERSITY, ILARA – MOKIN, ONDO STATE, NIGERIA  
DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES  
FIRST SEMESTER EXAMINATIONS: 2018/2019 ACADEMIC SESSION  
COURSE CODE: CHM 203 COURSE TITLE: ORGANIC CHEMISTRY I  
DURATION: 2 HOURS  
INSTRUCTIONS: Answer any three questions

HOD's SIGNATURE

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**Question One.**

- a. i.. Distinguish between the boiling and melting points of organic compounds. [4marks]  
ii. What are the factors that may likely affect the melting point of an organic compound? [4marks]  
iii. Give a brief explanation on any of the factors mentioned in 1(b) above [2marks]
- b. Suggest the possible factors that contributed to the variation observed in the melting points of the following pairs of compounds [6marks]
- Pentane ( $-130^{\circ}\text{C}$ ) and 2, 2-dimethylpropane ( $-17^{\circ}\text{C}$ )
  - Cyclohexane ( $-27^{\circ}\text{C}$ ) and Hexane ( $-145^{\circ}\text{C}$ )
  - Benzyl alcohol ( $-15^{\circ}\text{C}$ ) and benzoic acid ( $122^{\circ}\text{C}$ )
  - Methane ( $-182.5^{\circ}\text{C}$ ) and propane ( $-189.7^{\circ}\text{C}$ )
  - Cyclopentanethiol ( $-230^{\circ}\text{C}$ ) and cyclopentanol ( $-27^{\circ}\text{C}$ )
- c. Provide any two reasons why gasoline will not dissolve in Water [4marks]

**Question Two**

- a. i. Mention the two major classes of isomerism. [1mark]  
ii. Classify the following pairs of isomers under the appropriate classes or sub classes of isomerism they exhibit. [6marks]
- Pentane and 2-methyl butane
  - Butene and 2- butene
  - Propanol and Acetone
  - 3- hexene and Cyclohexane
  - Methoxy propane and 2- methoxy propane,
  - Maleic and Fumaric acid .

- b. Give a brief definition of each of the following terms: **[8marks]**
- Chiral Centre
  - Enantiomers
  - Optical isomers
  - Racemate
- c. With a suitable illustration, show the essential components of a typical a polarimeter **[5marks]**

### Question Three

- a. What are the four classes of organic reactions? **[4marks]**
- b. Differentiate between the following pairs **[8marks]**
- Unimolecular and bimolecular reactions
  - Nucleophile and Electrophile
  - Carbonium and Carbanion
  - Radical and Cation
- c. i. Compare and contrast  $S_N1$  and  $S_N2$  reactions **[6marks]**  
ii. Mention any two types of Photochemical reactions **[2marks]**

### Question Four

- a. i. Differentiate between
- Homolytic and Heterolytic Fission. **[2marks]**
  - Single-Phase and Multiple phase solution. **[2marks]**
- ii. Mention any three factors that accounted for the uniqueness of **[4marks]**
- b. i. Mention the various effects that could lead to electron density displacement in an organic molecule **[4marks]**
- ii. Comment on the following trends:  
Methyl fluoride boils at  $-78^\circ\text{C}$  while ethane boils at  $-89^\circ\text{C}$ , despite the similarity in their molecular weights **[2marks]**  
Dimethyl ether ( $\text{CH}_3-\text{O}-\text{CH}_3$ ) and ethanol ( $\text{CH}_3\text{CH}_2\text{OH}$ ) have widely different boiling points of  $-23^\circ\text{C}$  and  $78^\circ\text{C}$  respectively, even though they are isomeric compounds **[2marks]**
- c. What do you understand by rearrangement reactions? Mention any three types of the reaction. **[4marks]**