ELIZADE UNIVERSITY, ILARA – MOKIN, ONDO STATE, NIGERIA
DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES
FIRST SEMESTER EXAMINATIONS: 2018/2019 ACADEMIC SESSION
COURSE CODE: CHM 303 COURSE TITLE: ORGANIC CHEMISTRY II
DURATION: 2 HOURS
INSTRUCTIONS: Answer any three questions

HOD's SIGNATURE

Question One

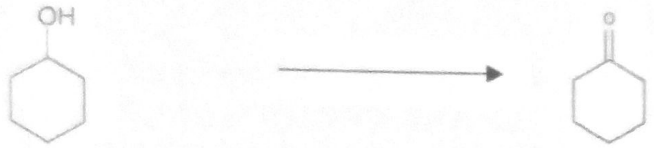
a. With suitable illustration compare and contrast alcohols and Phenol [**4marks**]
b. Write the structural formulae of the following alcohols [**12marks]**
   - 3-methylbutan-2-ol
   - Trans-2-bromocyclohexanol
   - 3-hydroxybutanoic acid
   - 4-ethylphenol
   - Propane-1,2-diol
   - 3-nitrophenol
c. (i). What is a carbinol carbon? **[2marks]**
   (ii.) What class of alcohol does $CH_3(CH_2)_4CH_2OH$ belong? **[1mark]**
   (iii) What are glycols? **[I mark]**

Question Two

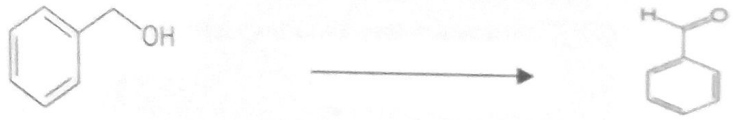
a. Give a brief explanation for the following trends observed in the solubility behaviour of alcohols: **[8marks]**
   - Alcohols with short carbon chain dissolve in water
   - Solubility decreases sharply with increasing length of carbon chain
   - Polyhydroxy alcohols are more soluble than monohydroxy alcohols
   - Branched chain alcohols are more soluble in water than their straight chain counterparts

b. i.Suggest any three processes for the synthesis of aldehydes and ketones. **[6marks]**
   ii. Predict the reagents necessary for the feasibility of the following reactions and supply the names of the reaction products **[6marks]**

   i. $CH_3CH_2CH_2\ CH_2CH_2OH \longrightarrow CH_3CH_2CH_2\ CH_2CH{=}O$
   1- Pentanol

ii. 

Cyclohexanol

iii. 

Benzyl Alcohol

Question Three

a. Give concise reason(s) for the effects of substituents on the acidity of the following pairs of alcohols. **[6marks]**

i. 2- chloroethanol is more acidic than ethanol

ii. 2,2-dichloroethanol is more acidic than 2-chloroethanol

iii. t-butyl alcohol is less acidic than methanol

b. Considering alcohol as a starting material, mention any six organic compounds that can be derived from it. **[6marks]**

c. i. What are epoxides? **[2mark]**

ii. Mention the three ways by which epoxides can be named and give one example in each case **[6marks]**

Question Four.

a. (i). Classify the following alcohols as primary, secondary or tertiary **[3marks]**

- 2-propanol
- 4-methylpentanol
- 2,3-dimethylbutan-2-ol

ii. Name any simple test to distinguish 1^0, 2^0, 3^0 alcohol. State the reagents and conditions required for the test and write down the expected observations. **[7marks]**

iii. Which of the alcohols in 1a(i) will not undergo oxidation reaction? **[2mark]**

b. (i). What are polynuclear aromatic hydrocarbons **[2marks]**

(ii) With suitable structures distinguish the following polynuclear aromatic hydrocarbons.: (i). Naphthalene (ii Anthracene iii. Phenanthrene **[3marks]**

c. i. Mention any three chemical reactions that naphthalene undergo **[3marks]**