NATIONAL OPEN UNVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES
SEPTEMBER, 2020_1 EXAMINATION

CHM 305 ORGANIC CHEMISTRY III

CREDIT UNIT: 2

TIME ALLOWED 2 ½ HOURS.

INSTRUCTIONS: ANSWER QUESTION 1 AND ANY OTHER 4 QUESTIONS

QUESTION 1

a. Give reasons why methanol is an alcohol. **5 Marks**

b. Define primary alcohols and polyhydric alcohols. **3 Marks**

c. Discuss the properties of alcohol given below: **8 Marks**

i. Physical appearance

ii. Melting or boiling point

iii. Density

iv. Solubility

d. Name and explain the process for preparation of primary, secondary and tertiary alcohols. **6 Marks**

QUESTION 2

a. Organometallic reagents react with aldehydes and ketones to give alcohols. Give two examples of these organometallic reagents. **4 Marks**

b. Give three enzymes that are involve in industrial production of ethanol. **4 Marks**

c. List and arrange the classes of monohydric alcohol in order of increasing acidic, basic strength and order of reactivity involving R—OH cleavage. **4 Marks**

QUESTION 3

a. List the types of ethers that are relevant to organic chemistry. **6 Marks**

b. Ethers can be named using the common system or the IUPAC system. Fill in the missing names in the table below: **6 Marks**

c.

SN	STRUCTURE	IUPAC	Common Names
	NAMES CH_3OCH_3	Methoxy methane	
	$CH_3CH_2OCH_3$		
	$CH_3CH_2OCH_3$	Methoxy ethane	
	$CH_3CH_2OCH_2CH_2CH_2Cl$		3-Chloropropyl ethyl ether
	$CH_3CHCH_2CH_3$ | OCH3		2-Buthyl methyl ether

QUESTION 4

a. Explain the concept of Metamerism in ethers. **6 Marks**

b. List and discuss three methods of preparation of ethers. **6 Marks**

QUESTION 5

a. List three each, physical and chemical properties of ethers. **6 Marks**

b. Give two major group of compounds formed when ethers react at the ethereal oxygen. **6 Marks**

QUESTION 6

a. Define epoxide. **3 Marks**

b. List the methods of formation of epoxides. **4 Marks**

c. List all the possible reaction of epoxide. **5 Marks**