

**NATIONAL OPEN UNVERSITY OF NIGERIA**

**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE & APPLIED SCIENCES**

**NOV. 2018\_1 EXAMINATION QUESTIONS**

**COURSE CODE: CHM 315**

**COURSE TITLE: CARBOHYDRATE CHEMISTRY**

**INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER THREE QUESTIONS**

**COURSE UNIT: 2**

**TIME ALLOWED: 2 HOURS**.

**QUESTION ONE**

**(a)** Describe the formation of furanose and pyranose (ring-chain monosaccharide) from

straight chain monomer. **(6 marks)**

**(b)** Write the equation for the reaction of glucose with the following reagents: **(4 marks)**

(i) Excess pyridine (CH3CO)O.

(ii) NaBH4

1. HCN
2. Br2 in H2O

**(c)** Spot the difference in the structure of a glucose and glucosamine. **(3 marks)**

**(d)** Compare and contrast between Inulin and oligofructose. **(7 marks)**

**(e)** Group these disaccharides into reducing and none-reducing sugar; Cellobiose, Trehalose

maltose and gentiobiose. **(2 marks)**

**(f)** How does glycosides affect lipids. **(3 mark)**

**QUESTION 2**

**(a)** Write a short note on glycosides **(6 marks)**

**(b)** Write the reaction which leads to the formation of two monomeric forms of methyl glucosides**. (7 marks)**

**(c)** Why do sugar monomers (enantiomers) rotate the plane of polarized light? **(2 mark)**

**QUESTION 3**

1. With the aid of a clear structure, distinguish between alpha and beta anomer of ring form glucose. **(8 marks)**
2. Give the structures of the under listed disaccharides: Maltose, Cellobiose and Lactose. **(3 marks)**
3. What is Homopolysaccharides; give three examples of Homopolysaccharides. **(4 marks)**

**QUESTION 4**

1. Write short note on the role of monosaccharaides in living organisms. **(6 marks)**
2. Predict the name of the monosaccharide if the carbonyl group is: **(1 mark)**
3. Aldehyde
4. ketone
5. With aid of a structure, differentiate between psedoheptoluse and fructose. **(4 mark)**
6. What are enantiomers? **( 4 marks)**

**QUESTION 5**

ai. Sugar alcohols are the hydrogenated forms of aldoses or ketoses, discuss. **(4 marks)**

**ii.** Give the structure of glucitol **(1 mark)**

1. Mention three characteristic of monosacharide use in its classification. **(3 marks)**
2. Write a short note on the following: Dextrins, High Fructose Corn Syrup (HFCS), Modified starch and Polydextrose. **(7 marks)**