



**NATIONAL OPEN UNIVERSITY OF NIGERIA
14-16 AHMADU BELLO WAY, VICTORIA ISLAND LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
MARCH/APRIL 2015 EXAMINATION**

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: CHM 315
COURSE TITLE: Carbohydrate Chemistry

TIME: 2 hours

Instruction: Answer 4 questions only

1. a Define the term Heteropolysaccharides (1mark)
b. Write briefly on the following (*Marks will be awarded for well represented structures*)
 - i. Arabinoxylans. (6marks)
 - ii Chitin (4½ marks)
 - iii. Pectin (6marks)

- 2 a. What are Disaccharides? (1mark)
b. Write briefly on following disaccharides (marks will be awarded for well represented structures)
 - i. sucrose (5½marks)
 - ii. Lactose (5½marks)
 - iii. Cellobiose (5½marks)

- 3a Write briefly on Glycosides (5marks)
b. With the aid of chemical structures **only** show the differences in the following
 - i. D-gluconic acid and D-glucuronic acid (3 marks)
 - ii. D- glucose and D-ribose (3 marks)
 - iii. α-D-glucose and β- D-glucose (3½marks)
 - iv. α-D-glucose and α- D- glucose (3marks)

4. (a) Define carbohydrates (2marks)
(b) Mention five importance of carbohydrates (5marks)
(c) Carbohydrates are macromolecules with diverse characteristics. Classify carbohydrates based on four mentioned characteristics (10½marks)

5 i. Write short notes on the following. Marks shall be given for correctly represented structures

- a. Ketose (5marks)
- b. Non -reducing sugars(5marks)
- c. Sugar Alcohols

ii Mention two forms in which the cyclic structures of sugars can occur and make a skeletal representation of any(2½marks)

6. Write one sentence definition for each of the following terms:

- a. Chiral Carbon (1 mark)
- b. Epimers (1 mark)
- c. Enantiomers (1 mark)
- d. Diastereomer (1 mark)

b. Write briefly on Stereoisomers (3½mark)

- c. Enumerate and explain briefly four reactions of carbohydrates **(10marks)**
(There will be no need for structures)