



NATIONAL OPEN UNIVERSITY OF NIGERIA

14/16, Ahmadu Bello Way, Victoria Island

SCHOOL OF SCIENCE AND TECHNOLOGY

October, 2013 Examination

Course Code: CHM 315

TIME: 2 hours

Course Title: Carbohydrate Chemistry

Instruction: Answer 4 questions only

1. (a) Highlight four chemical properties of carbohydrates
(8 marks)
(b) Write the structures of the following monosaccharides:
(i) Galactose (ii) Mannose (5½marks)
(c) Using appropriate structures, differentiate between amylase and amylopectin
(4 marks)
2. (a) In tabular form, describe the composition of the following disaccharides;
sucrose, maltose, trehalose, lactose and melibiose.
(10 marks)
(b) When some adult Africans drink fresh milk they develop gastrointestinal upsets
followed by colic pains. What are the reasons for this pain? What would be your advice to
people having such problems? (7½marks)
3. (a) Pure cotton and starch are both polymers of glucose. Distinguish between these
two polysaccharides in terms of structural and physical characteristics.
(9½ marks)
(b) Name four structural carbohydrates found in animals and state their
compositions. (8 marks)
4. (a) What are glycoproteins?
(7marks)
(b) How do they differ from proteoglycan?
(4marks)
(c) Pectin is a heteropolysaccharides in plant tissues. Justify this statement
(6½marks)
5. (a) Write a short note on the chemical reactions of monosaccharides.
(10marks).

(b) What are epimers? Give three examples.
(5 marks)

(c) What are asymmetric centres.
(2½ marks)

6. (a) (i) Differentiate between reducing and non-reducing sugars. (10 marks)
(ii) Give an example of each. (5 marks)
(b) Explain the term 'mutarotation'. (5 marks)
(c) Mention two ways of presenting the chemical structure of monosaccharides.
(2½ marks)