



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE & APPLIED SCIENCES**  
**2021\_1 EXAMINATION**

**COURSE CODE:** CHM315

**CREDIT UNIT:** 2

**COURSE TITLE:** CARBOHYDRATE CHEMISTRY

**TIME:** 2 HRS

**INSTRUCTION:** Answer Question ONE (1) and any other Three (3) Questions

- Q1. a) In not more than two lines, differentiate between aldose and ketose (3 marks)
- b) i. What is a pentose? (2 marks)
- ii. List three examples of pentose (3 marks)
- c) i. Explain formation of glucosamine. (3 marks)
- ii. Mention two uses of glucosamine (2 marks)
- d) D-Glucose has 16 possible stereoisomers. Explain (5 marks)
- e) What is the implication of dextrose equivalent of 100? (2 marks)
- f) i. Define lactose intolerance (3 marks)
- ii. Mention two problems associated with lactose intolerance (2 marks)
- Q2. a) Write short note on “cellulose nitrate” (5 marks)
- b) Lactose or Yogurt? Which one is advisable an adult consumes and why? (5 marks)
- c) Ketoses differ from aldoses, yet their chemistry are linked. Explain? (5 marks)
- d) Distinguish anomerism from epimerism and give one example for each (5 marks)
- e) With a specific equation, illustrate mutarotation equilibrium in glucose (5 marks)
- Q3. a) With equation only, show equilibration of two anomeric forms of glucose (5 marks)
- b) Give a concise account of formation of aldonic acid from glucose (5 marks)
- c) i. What are homopolysaccharides? (2 marks)
- ii. List three examples of homopolysaccharides (3 marks)
- Q4. a) Highlight three attributes of amylopectin that differs it from amylose (6 marks)
- b) List classes of carbohydrate based on (i) functional group (ii) reactivity (4 marks)

c) With Haworth structural format, distinguish D-glucose from D-mannose. (5 marks)

Q5. a) Why are 5- and 6-membered ring sugar more favored than other ring sizes (3 marks)

b) Show that D-(+)-glucose and D-(+)-mannose have common osazone (6 marks)

c) Cytidine is an amino derivative of ribose. State its three major uses (6 marks)