



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**DEPARTMENT OF PURE AND APPLIED SCIENCES**

**2021\_2 EXAMINATIONS**

**COURSE CODE:** CHM 315

**COURSE TITLE:** CARBOHYDRATE CHEMISTRY

**INSTRUCTION:** *Answer question 1 and any other 3 questions*

**CREDIT UNIT:** 2

**TIME:** 2 HRS

Q1a. Draw the Haworth projection and Chair conformation structures of the following:

- i)  $\alpha$ -D-glucopyranose (4 marks)
- ii)  $\beta$ -D-galactopyranose (4 marks)
- iii)  $\beta$ -D-allopyranose (4 marks)

1b. Write short note on each of the following compounds in carbohydrate chemistry

- i) Trehalose (5 marks)
- ii) Uronic acid (4 marks)
- iii) Gentiobiose (4 marks)

Q2. a) Recommend, with reasons, a sugar alcohol for sugar-free candies production (5 marks)

- b) Cellulose – a suitable food for cow but not for human. Explain (5 marks)
- c) Highlight five functions of alginic acid derivatives (5 marks)

Q3. a) With the aid of equation, show conversion of D-(-)-ribose to ribonic acid (5 marks)

- b) Distinguish between aldonic acid and aldaric acid (5 marks)
- c) Write the structure of xylan (5 marks)

Q4 Write short notes on the underlisted phenomenon

- a) Hemicellulose (5 marks)
- b) Beta-Glucan (5 marks)
- c) Cellulose acetate (5 marks)

Q5 a) Describe the production of hydrogenated glucose syrup from starch (4 marks)

- b) Define cellulose gum and state its three uses (5 marks)
- c) Itemize three properties affected by slight change in OH orientation (3 marks)
- d) Briefly describe the formation of glycoside (3 marks)