



NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE
EXPRESS WAY,
JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2024 1 EXAMINATION

COURSE CODE: CHM 315
COURSE TITLE: CARBOHYDRATE CHEMISTRY
COURSE UNIT: 2
TIME: 2 HOURS
INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

Question one score 30 marks with the other two scoring 20 marks each

QUESTION ONE

- (1a) i. Identify the different categories upon which monosaccharides are classified (3Marks)
ii. What are Homopolysaccharides? (2Marks)
iii. Give the molecular formula of Hexoses (1 Mark)
- (1b) In cyclic form show how glucose react with Pyridine, Hydriodic acid, Nitric acid, Br, H₂O, HCN and NaBH₄ (6 marks)
- (1c) i. Explain how aminosaccharides are formed (2 Marks)
ii. Mention the uses of Alginates in Food products (2 Marks)
- (1d) i. Describe the term plaque in reference to dextran (2 marks)
ii. Name the catalyst used in Williamson synthesis of α -glucopyranose (1 Mark)
iii. State the reason why humans cannot digest cellulose but animals such as cattle's does. (3 Marks)
- (1e) i. Give the nomenclature of maltose, gentiobiose and cellobiose (6 Marks)
ii. What is pectin? (2 Marks)

QUESTION TWO

- (2a) i. What polysaccharides is present in jam? (2 Marks)
ii. Enumerate the usefulness of carbohydrates to both animals and plants (2 Marks)
- (2b) i. State the uses of glucosamine (4 Marks)
ii. If crystalline α -D-glucose is dissolved in water, the specific rotation drops gradually from an initial value of $+112^{\circ}$ to an equilibrium value of $+52^{\circ}$. These changes in optical rotation are called ... (2 Marks)