



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**FACULTY OF AGRICULTURAL SCIENCES**  
**DEPARTMENT OF ANIMAL SCIENCE AND FISHERIES**  
**2025\_2 EXAMINATIONS**

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**COURSE CODE:** ANP 308

**COURSE TITLE:** Metabolism of Carbohydrates, Lipids, Proteins and Nucleic Acids

**CREDIT UNIT:** 2 CU

**TOTAL SCORE:** 70 MARKS

**TIME ALLOWED:** 2 Hours

**INSTRUCTIONS:** ATTEMPT QUESTION 1 (30 MARKS) AND ANSWER ANY OTHER TWO (20 MARKS EACH)

**Q1.**

- (a) Provide the three broad classifications of carbohydrates. *(3 marks)*
- (b) Identify the four major protein structures, according to their hierarchical organization. *(4 marks)*
- (c) Highlight the three different metabolic circumstances under which amino acids undergo degradation. *(6 marks)*
- (d) Discuss the various functions of lipids, emphasizing their roles in cellular and metabolic processes. *(7 marks)*
- (e) Outline the classification of lipids according to Bloor. *(3 marks)*
- (f) With the aid of a chart, illustrate the major pathways of carbohydrate metabolism, emphasizing the fate of glucose and indicating the specific sites of entry for each pathway. *(7 marks)*

**Q2.**

Provide a concise explanation of the following:

- (a) Maltose: its structure, sources, and role in metabolism. *(4 marks)*
- (b) Cellobiose: its structure, significance, and role in carbohydrate metabolism. *(4 marks)*
- (c) Starch: its composition, breakdown, and biological importance. *(7 marks)*
- (d) Mechanism of intestinal absorption of lipids, detailing the processes involved. *(5 marks)*

**Q3.**

Give an in-depth discussion on conjugated and derived proteins, including their structure, formation, and functions. *(20 marks)*

**Q4.**

- (a) Provide a detailed description of ammonia transport in the blood, including the biochemical pathways and physiological significance of this process. *(15 marks)*
- (b) Explain the action of pancreatic lipase in the digestion process, highlighting its role in lipid breakdown. *(5 marks)*