



**NATIONAL OPEN UNIVERSITY OF NIGERIA  
FACULTY OF AGRICULTURAL SCIENCES  
DEPARTMENT OF ANIMAL SCIENCE AND FISHERIES**

**COURSE CODE:** ANP309  
**COURSE TITLE:** Analytical Technique For Animal Production  
**CREDIT UNIT:** 2 Credit Units  
**TOTAL SCORE:** 70 MARKS  
**TIME ALLOWED:** 2 HOURS  
**INSTRUCTIONS:** ATTEMPT QUESTION 1 (COMPULSORY) AND ANY OTHER THREE QUESTIONS

- Q1a Define Artificial Insemination **2 marks**  
b State any four (4) benefits of Artificial Insemination. **4 marks**  
c. What are the limitations associated with Artificial Insemination? **5 marks**  
d. List and explain factors that enhance semen collection. **14 marks**
- Q2 Briefly discuss the following types of biological assay. **7 marks**  
i. Protein Efficiency Ratio **5½ marks**  
ii. Net Protein Utilization **2½ marks**  
iii. Apparent Digestibility
- Q3 Write short note on the following:  
i. pH of fresh semen **4 marks**  
ii. Semen concentration **7 marks**  
iii. Colour and appearance of semen. **4 marks**
- Q4a Define Digestibility and Digestibility trials **3 marks**  
b Give the merits and limitations of *in vivo* and *in vitro* trials. **12 marks**
- Q5 Describe the following methods of semen collection **7 marks**  
a. The use of Electro ejaculator **8 marks**  
b. The use of artificial vagina.
- Q6a. State the properties of enzymes. **5 marks**  
b. What are the protocols for the extraction of enzymes? **5 marks**  
c. What do you understand by column chromatography? **5 marks**