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**NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF AGRICULTURAL SCIENCES
DEPARTMENT OF ANIMAL SCIENCE AND FISHERIES
SEPTEMBER, 2020_1**

COURSE CODE: ANP 309
COURSE TITLE: Analytical Technique for Animal Production II
CREDIT UNIT: 2 CU
TOTAL SCORE: 70 MARKS
TIME ALLOWED: 2 HOURS
INSTRUCTIONS: ANSWER QUESTION 1 (25 MARKS) AND ANY OTHER THREE(15 MARKS EACH)

- Q1a Define Artificial Insemination (AI).
b State any four (4) benefits of Artificial Insemination AI.
c. Enumerate the limitations associated with Artificial Insemination AI?
d. List and explain factors that enhance semen collection. **25 marks**

- Q2 Briefly explain the following types of biological assay.
i. Protein Efficiency Ratio
ii. Net Protein Utilization
iii. Apparent Digestibility **15 marks**

- Q3 Write short note on the following:
i. pH of fresh semen
ii. Semen concentration
iii. Colour and appearance of semen. **15 marks**

- Q4a Define Digestibility and Digestibility trials.
b Give the merits and limitations of *in vivo* and *in vitro* trials. **15 marks**

- Q5 Describe the following methods of semen collection:
a. The use of Electro ejaculator
b. The use of artificial vagina. **15 marks**

- Q6a. State the properties of enzymes.
b. What are the protocols for the extraction of of enzymes?
c. What do you understand by column chromatography? **15 marks**