



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**Faculty of Agricultural Sciences**  
**Department of Animal Science and Fisheries**  
**POP Examination 2020\_1**

Course: ANP502: Ruminant Nutrition  
Credit Unit: 2  
Time Allowed: 2 hours.

**INSTRUCTIONS: Answer question one (Compulsory: 25 Marks) and any other THREE (15 marks each)**

**QUESTION ONE**

- i. Briefly describe the term feed additives
- ii. Explain basic characteristics of an ideal feed additive
- iii. List common feed additives and their mode of action **25 marks**

**QUESTION TWO**

- i. What are the basic principles to be considered when formulating
- ii. What characteristics of the animal that determine the types of diets to be fed? **15 marks**

**QUESTION THREE**

Write short note on Metabolisable energy and heat energy.

Highlight the factors that determines the level of heat energy produced in an animal **15 marks**

**QUESTION FOUR**

- i. List the main substrates of digestion
- ii. Express in your own words the activities of the following key organisms bacteria involvement in the breakdown of protein in the rumen
  1. *Prevotella* bacteria species
- iii. Hyper Ammonia Producing (HAP) bacteria
- iv. Highlight the factors may affect the rate and extent of protein degradation. **15 marks**

## QUESTION FIVE

Explain in your own word the following nutritional disorders

- i. Grass Tetany
- ii. Acute Pulmonary Emphysema

15 marks

## QUESTION SIX

Write short note on three (3) of the following.

- i. Nutrient Requirements of the Animal
- ii. Available Ingredient for Animal
- iii. Feedstuffs and Feedstuffs Analysis
- iv. Cost of the Ingredient

15 marks