FACULTY	**HEALTH SCIENCE & VETERINARY MEDICINE**		
SCHOOL	**VETERINARY MEDICINE**		
DEPARTMENT	**PRECLINICAL STUDIES**		
SUBJECT	**ANIMAL NUTRITION**		
SUBJECT CODE	**V3612EN**		
DATE	**NOVEMBER 2024**		
DURATION	**3 HOURS**	**MARKS**	**150**

SECOND OPPORTUNITY EXAMINATION PAPER

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This question paper memo consists of three (3) pages including this page.

Instructions:

- ***This question paper consists of six questions***
- **Attempt ALL questions!!**
- **Calculators are allowed in the exam**

UNIVERSITY OF NAMIBIA EXAMINATIONS

QUESTION 1 **[25 MARKS]**

(a) Define the following terms as they relate to animal nutrition:

(i) Anti-nutritional factors (2)

(ii) Bioavailability (2)

(iii) Apparent digestibility (2)

(iv) Metabolisable energy (2)

(v) Neutral detergent fibre (2)

(b) Describe the laboratory procedures of determining the dry matter content of feed. (5)

(c) Write short notes on the following:

(i) Starch (5)

(iii) Cellulose (5)

QUESTION 2 **[25 MARKS]**

(a) Briefly explain the digestion and absorption of feed in the small intestines of poultry. (10)

(b) A Jersey heifer eats 15 kg of *Chloris gayana* grass hay with 92% dry matter, 10%CP/kg DM, 45%NDF/kg DM, 12% ash/kg DM and voids 12 kg of fresh dung with 45% dry matter, 8%CP/kg DM, 35%NDF/kg DM, and12% ash/kg DM. Showing all steps and giving your answers to one decimal point calculate the percent digestibility of the following nutrients in the grass hay:

(i) Dry matter (3)

(ii) Crude protein (3)

(iii) Organic matter (3)

(c) Describe six limitations of the proximate analyses system. (6)

QUESTION 3 **[25 MARKS]**

(a) Briefly describe the two-stage *in vitro* technique of measuring digestibility of livestock feeds. (10)

(b) Discuss the potential benefits of dietary tannins to ruminants. (15)

QUESTION 4 **[25 MARKS]**

(a) Briefly describe any five basic information required in order to formulate a ration for any given animal. (5)

(b) A farmer in Oshana Region has available on the farm millet grain with 87 % DM, 8 % CP, 11 MJ/kg ME and 80 % TDN, and sunflower meal with 89 % DM, 34 % CP, 9.5 MJ/kg ME and 69 % TDN.

(i) Using the Pearson Square method, calculate the composition of the required mixture of the two ingredients to formulate a 16 % CP pullet meal. Show all the steps of your work and give your answers to two decimal points. (4)

(ii) Determine the ME and TDN content of the broiler meal. (6)

(c) Describe the functions and deficiency symptoms of calcium and phosphorus in animals. (10)

QUESTION 5 **[25 MARKS]**

(a) Explain the functions and deficiency symptoms of the fat-soluble vitamins in animals. (15)

(b) Giving relevant examples, describe the classification of livestock concentrate feed resources. (10)

QUESTION 6 **[25 MARKS]**

(a) Explain the four broad functions of minerals in animals. (10)

(b) Discuss the potential roles of fibrolytic enzyme additives to high fibre feed. (15)

END OF PAPER