



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF AGRICULTURAL AND FOOD SCIENCES
UNIVERSITY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN ANIMAL
SCIENCE
3RD YEAR 2ND SEMESTER 2016/2017 ACADEMIC YEAR
REGULAR

COURSE CODE: AAS 3323

COURSE TITLE: RATION FORMULATION

EXAM VENUE: **STREAM: (BSc. Animal Science)**

DATE: **EXAM SESSION:**

TIME: 2 HOURS

Instructions

- 1. Answer ALL questions in Section A (compulsory) and ANY TWO questions in Section B**
 - 2. Candidates are advised not to write on the question paper**
 - 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**
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SECTION A [30 MARKS]

Answer ALL questions in this section

1. Give the three main types of carbohydrates consumed by ruminants. (3 marks)
2. Explain the main advantage of incorporating fats into broiler rations. Give two limitations. (3 marks)
3. State two main sources of phosphorus and one main source of calcium in animal feeds. (3 marks)
4. State the main constraint of the use of cotton seed cake in poultry rations. (3marks)
5. Distinguish between dry milling and wet milling in maize processing. (3 marks)
6. Explain the trial and error method of ration formulation. (3 marks)
7. Using Double Pearson Square method, formulate a ration containing 18% crude protein and energy of 2.7 Mcal/kg of feed by using the following information:
Maize: crude protein (8.0%); Energy (3.42 Mcal/kg)
Maize bran: crude protein (10.6%); Energy (2.50 Mcal/kg)
Fish meal: crude protein (52%); Energy (2.80 Mcal/kg) Show your working. (6 marks)
8. Give three ingredienss considered in slack space. (3 marks)
9. Cost minimization is very key in ration formulation. Explain. (3 marks)

SECTION B [40 MARKS]

Answer ANY TWO questions from this section

10.
 - a) State the main objective of ration formulation and outline the general considerations of ration formulation. (10 marks)
 - b) Formulate a dairy ration containing 15% crude protein using two feedstuffs: maize bran (12% crude protein); Cotton seed cake (35% crude protein). Use both Pearson square method and simultaneous equations method. Show all your workings. (10 marks)
11. A 100 kg layer ration is to be formulated according to Kenya Bureau of Standards specifications for laying hens: Crude protein (16-17%); Energy (2700-2800 Kcal/kg feed); Calcium (3.7-4.0 %); Fiber (12% maximum). Describe the constraints which a nutritionist has to content with, when using linear programming to formulate the ration. Use the following ingredients: Maize, maize bran, pollard, fish meal, bone meal, salt, sunflower cake. (20 marks)
12.
 - a) Evaluate the advantages of weighted goal programming over linear programming in ration formulation. (10 marks)
 - b) Ranking/grouping of feedstuffs can be done according to their contents of a particular nutrient. which they can supply. Rank the following feedstuffs according to their energy contents: Roughages; mineral supplements; oils; protein concentrates, fats, grains. (10 marks)
13. In the absence of a mixer at the farm level, feed mixing can be done manually using various techniques. Analyze these techniques. (20 marks)

