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PRINCIPLES OF ANIMAL PRODUCTION I
June/July 2010
Time: 3 hours

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THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN AGRICULTURE
MODULE I
PRINCIPLES OF ANIMAL PRODUCTION I
3 hours

INSTRUCTIONS TO CANDIDATES

*You should have an answer booklet for this examination.
This paper consists of EIGHT questions.
Answer any FIVE of the EIGHT questions.
Maximum marks for each part of a question are as shown.*

This paper consists of 5 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

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1. (a) Define the following terms as used in animal breeding:

- (i) generation interval;
 (ii) genetic correlation;
 (iii) heterosis;
 (iv) hybrid vigour;
 (v) lethal gene.

(5 marks)

(b)

Identify the variables in the following equation that represents genetic change due to selection:

$$\Delta G = h^2 \times (\bar{P}_s - \bar{P})$$

(8 marks)

(c) (i) Enumerate the basis of individual selection method.

(ii) State three disadvantages of individual selection method.

(7 marks)

2. (a) Highlight five drought coping management strategies to minimize livestock losses in range lands.

(10 marks)

(b) State the methods used in the following range management practices:

- (i) bush control;
 (ii) range resource conservation;
 (iii) range reseeding.

(10 marks)

3. (a) State four feeding practices that ensure good health and productivity of farm animals.

(4 marks)

(b) Outline the procedure in actual hand milking.

(7 marks)

(c) State the requirements of livestock housing.

(5 marks)

(d) Explain how the weight of cattle can be estimated using a weigh band.

(4 marks)

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4. (a) Explain how the following may be used to assess the health status of the farm animals:

- (i) mucous membrane;
- (ii) defaecation;
- (iii) appetite and feeding.



(10 marks)

(b) In reference to farm animals, state:

- (i) four reasons for maintenance of good health;
- (ii) three types of losses due to diseases;
- (iii) three preventive measures of diseases.

(10 marks)

5. (a) Study and complete table 1.

Name of Disease	Causative Agent	Notifiable	Any two controlled by vaccination
- Contagious pleuro pneumonia (CCPP)	<i>Corynebacterium pseudotuberculosis</i>	Yes	- Vaccination
- Anthrax	<i>Bacillus anthracis</i>	Yes	- Vaccination
- Dermatophilosis	<i>Dermatophilus</i>	No	-
- East Coast Fever	Parasite	No	-
- African Swine Fever	<i>African swine fever virus</i>	Yes	- Vaccination

Table 1

(10 marks)

(b) Explain five preventive measures for the control of mastitis in a milking herd.

(10 marks)

- *Streptococcus* spp
- Clean teats
- Disinfect udders
- Observe milking hygiene
- Separate the water from towels
- Clean teats with alcohol

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6. (a) Table 2 shows various materials that may be used in animal nutrition. Study and complete the table according to the various categories.

Type of Material	Categories		
	Additive	Concentrate	Roughages
Green fodder			✓
Antibiotics	✓		
Hay		✓	✓
Cotton seed cake		✓	
Hormones	✓		✓
Straw		✓	✓
Sunflower cake		✓	
Fish meal		✓	

Table 2

(4 marks)

- (b) State the importance of feed additives in animal nutrition. (3 marks)
- (c) Compare the nutritional value of roughages to that of concentrates in animal nutrition. (5 marks)
- (d) (i) Enumerate **five** factors that affect the quality of hay. (5 marks)
- (ii) State the role of additives in silage making. (3 marks)

7.

- (a) Define the following terms:

- (i) phenotypic frequency;
- (ii) genotypic frequency;
- (iii) phenotype;
- (iv) genotype.

(4 marks)



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- (b) Study table 3 and answer the questions that follow.

Coat colour of a cattle breed	Genotype	Nos (n)	Genotypic frequency
Red	RR	36	-
Roan	Rr	48	-
White	rr	16	-

Table 3

- (i) Determine the genotypic frequencies.
- (ii) Calculate the gene frequencies $F(R)$ and $F(r)$. $(\frac{3}{16} \times 60) = 2.25$
- (iii) Show that $F(R) + F(r) = 1$. (16 marks)
8. (a) (i) A farmer feeds his animal with 60 kg of grass which has a dry matter content of 15%.
Calculate the dry matter in kgs received by the animal. (3 marks)
- (ii) Grass with a dry matter content of 20 percent contains 50 gms of digestible crude protein (DCP) per a kg dry matter.
Determine how much of DCP is contained in 40 kgs of the grass. (4 marks)
- (iii) State the composition of the dry matter of a feed. (5 marks)
- (b) Based on laboratory analysis of an animal feed, explain the terms:
- (i) crude protein;
- (ii) digestible crude protein. (8 marks)

