



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P1

FEBRUARY/MARCH 2016

MEMORANDUM

MARKS: 150

This memorandum consists of 9 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	B ✓✓	(10 x 2)	(20)
	1.1.2	A ✓✓		
	1.1.3	D ✓✓		
	1.1.4	C ✓✓		
	1.1.5	C ✓✓		
	1.1.6	C ✓✓		
	1.1.7	B ✓✓		
	1.1.8	A ✓✓		
	1.1.9	D ✓✓		
	1.1.10	D ✓✓		
1.2	1.2.1	B only ✓✓	(5 x 2)	(10)
	1.2.2	Both A and B ✓✓		
	1.2.3	None ✓✓		
	1.2.4	Both A and B ✓✓		
	1.2.5	A only ✓✓		
1.3	1.3.1	Vitamin K/phyloquinone ✓✓	(5 x 2)	(10)
	1.3.2	Rabies ✓✓		
	1.3.3	Vaccination ✓✓		
	1.3.4	Embryonic ✓✓		
	1.3.5	Oxytocin ✓✓		
1.4	1.4.1	Silage ✓	(5 x 1)	(5)
	1.4.2	Zinc/Zn ✓		
	1.4.3	Pearson square ✓		
	1.4.4	Fluke worm/liver fluke ✓		
	1.4.5	Monozygotic/identical ✓		

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canal of fowls****2.1.1 Identify****A – Crop** ✓**B – Duodenum/small intestine** ✓**E – Pancreas** ✓

(3)

2.1.2 Ways in which structure C is adapted

• Thick, muscular walls for grinding feed ✓

• Presence of small stones for grinding feed ✓

(2)

2.1.3 Identification of structure B and estimation of pH

• Proventriculus/true stomach/glandular stomach ✓

• pH less than 7/acidic ✓

(2)

2.2 A schematic representation of the components of feeds**2.2.1 Identification of substances****A – Dry matter/DM** ✓**B – Inorganic matter/minerals/elements/ash components** ✓**C – Vitamins** ✓

(3)

2.2.2 Distinction between oil and fat**Oil – Unsaturated/liquid at room temperature/plant origin** ✓**Fat – Saturated/solid at room temperature/animal origin** ✓

(2)

2.2.3 End-products of digestion**(a) Carbohydrate – Glucose/energy** ✓**(b) Protein – Amino acids** ✓

(2)

2.3 Fodder flow programme**2.3.1 Difference in feed requirement against the available feed for September**

Feed requirement 66 tons – feed available 54 tons

= 12 tons deficit/shortage ✓

(1)

January

Feed requirement 49 tons – feed available 78 tons

= 29 tons surplus/excess ✓

(1)

2.3.2 Calculation of the total DM available for B

40 + 35 + 54 + 46 + 17 + 30 + 20 + 10 + 10 + 32 ✓

= 294 tons ✓

(2)

2.3.3 The month when the veld supplied 15 tons of fodder

February ✓

(1)

2.4 Co-efficient of digestibility of green lucerne**2.4.1 Determination of the co-efficient of digestibility of the green lucerne**

$$DC = \frac{\text{Dry matter intake (kg)} - \text{dry matter excreted (kg)}}{\text{dry matter intake (kg)}} \times \frac{100}{1} \quad \checkmark$$

$$= \text{DM intake } 2,5 \text{ kg} \times 0,6 = 1,5 \text{ kg moisture}$$

$$2,5 \text{ kg} - 1,5 \text{ kg} = 1,0 \text{ kg DM} \quad \checkmark$$

OR

$$\text{DM intake } 2,5 \text{ kg} \times 0,4 = 1,0 \text{ kg DM}$$

$$= \frac{1,0 \text{ kg} - 0,255 \text{ kg}}{1,0 \text{ kg}} \times \frac{100}{1} \quad \checkmark$$

$$= 74,5 \quad \checkmark \quad \% \quad \checkmark$$

(5)

2.4.2 Specific nutrient which fits each of the following descriptions:

- (a) Iron/Fe \checkmark
- (b) Cobalt/Co \checkmark
- (c) Vitamin B₂/riboflavin \checkmark
- (d) Calcium/Ca \checkmark

(4)

2.5 Data representing the laboratory results of THREE feed**2.5.1 Calculation of the NR for feed 2**

$$NR = 1: \frac{\text{TDN\%} - \text{DP\%}}{\text{DP\%}} \quad \checkmark$$

$$= 1: \frac{75\% - 15\%}{15\%} \quad \checkmark \quad \text{OR} \quad = 1: \frac{60\%}{15\%} \quad \checkmark$$

$$NR = 1: 4 \quad \checkmark$$

(3)

2.5.2 Identification of the feed (1, 2 or 3) recommended

- Feed 2 \checkmark

(1)

2.5.3 Reason to justify the answer in QUESTION 2.5.2

- It has a narrower nutritive ratio \checkmark
- Suggesting a comparatively higher protein necessary for milk production \checkmark

(Any 1)

(1)

2.5.4 The cheapest feed

- Feed 3 \checkmark

(1)

2.5.5 Reason for the answer in QUESTION 2.5.4

- This feed has a lower protein content \checkmark
- Feed with lower protein is cheap \checkmark

(Any 1)

(1)

[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL**3.1 An illustration of a proper housing structure for keeping broilers****3.1.1 Requirements of the roofing material to regulate temperature**

- Have a reflective surface on the outside ✓
- Help to reduce conduction of heat ✓ (2)

3.1.2 TWO other ways in which temperature can be regulated

- Heat lamps/heaters in cold weather ✓
- Ventilation systems ✓
- Air conditioning ✓ (Any 2) (2)

3.1.3 Best orientation for a broiler house

- East ✓
- Reason**
- To reduce the effect of direct sunlight ✓ (2)

3.1.4 TWO purposes of the part labelled A

- To allow ventilation/air flow ✓
- To allow diffused sunlight ✓ (2)

3.2 The role of shelter in animal production**3.2.1 Forms of shelter**

- Planting trees ✓
- Building kraals ✓
- Erecting concrete walls ✓ (Any 2) (2)

3.2.2 Consequences of lack of shelter

- Lower/slower growth/production ✓
- Exposure to predators ✓
- Exposure to pests ✓
- Stock theft ✓
- Higher feed intake when it is cold ✓
- lower feed intake when it is hot ✓ (Any 3) (3)

3.2.3 Reason to use up more energy

- To provide energy to sustain their body temperature ✓ (1)

3.3 The life cycles of two external parasites (ticks A and B)**3.3.1 Length for hatching of tick A's eggs**

- 1 month ✓ (1)

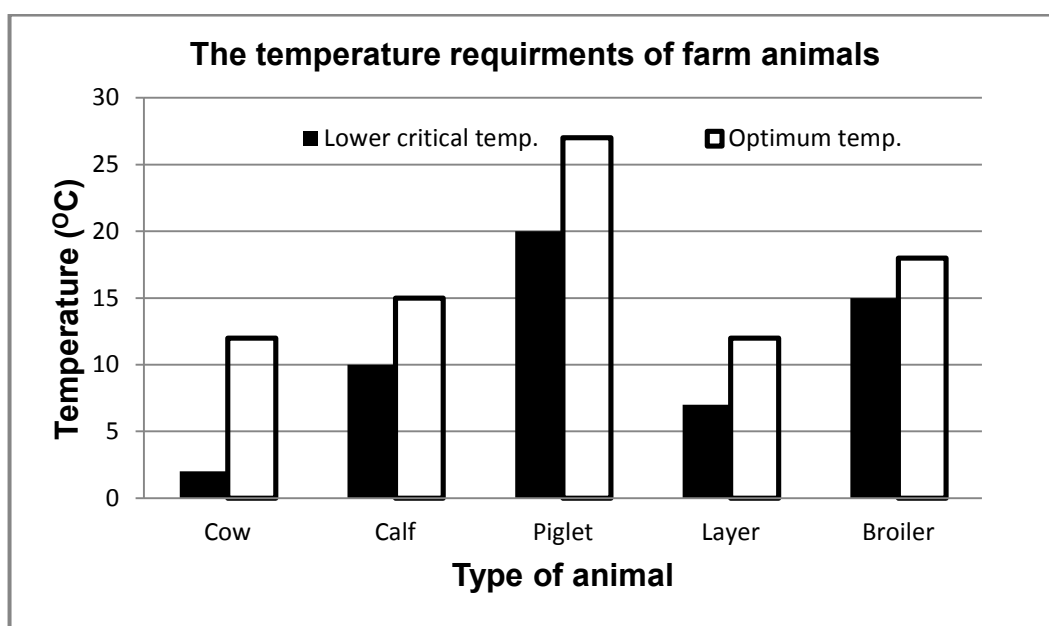
3.3.2 Disadvantage to cattle

- Open wounds form ✓
- Through which blowflies can attack animals ✓
- This can cause diseases ✓ (Any 2) (2)

- 3.3.3 **TWO reasons for preventing parasite infestation**
- Infected animals may die/Loss of production/income ✓
 - Medication/treatment is expensive/higher production cost ✓ (2)
- 3.3.4 **Reasons why is it difficult to control the numbers of tick B**
- The adult stage is only found in birds ✓
 - Which is difficult to catch/control/treat ✓ (2)
- 3.4 **The role of the state in regulating farming practises**
- 3.4.1 **Type of research done by the state at the Veterinary Institute**
- Veterinary research to improve vaccines/diagnostic/new products ✓
 - Surveillance/control/preventing diseases ✓
 - Producing disease/blood vaccines ✓ (3)
- 3.4.2 **Purpose of a quarantine station**
- To isolate/detain animals and ✓
 - prevent diseases/pests entering/spreading in the country ✓ (2)
- 3.4.3 **Other roles the state play to protect the animal industry**
- Animal health schemes ✓
 - Duties of owners of animals ✓
 - Import bans ✓
 - Importation of vaccines ✓
 - Movement permits ✓ (Any 2) (2)

3.5 **The temperature required by farm animals**

3.5.1 **Bar graph**



Criteria/rubric/marketing guidelines

- Correct heading ✓
- X axis – correctly calibrated and labelled (Type of animal) ✓
- Y axis – correctly calibrated and labelled (Temperature) ✓
- Correct units (°C) ✓
- Accuracy ✓
- Bar graph ✓

(6)

3.5.2 Deduction of farm animal with highest optimum temperature

Piglet ✓

(1)

[35]**QUESTION 4: ANIMAL REPRODUCTION****4.1 The stages of the oestrus cycle in a cow****4.1.1 Indication of oestrus cycle stages:****(a)** C ✓

(1)

(b) B ✓

(1)

(c) A ✓

(1)

4.1.2 Hormones during stage C**(a)** Oestrogen ✓

(1)

(b) Luteinising hormone ✓

(1)

4.1.3 The role of the hormone

- Responsible for the rupturing of the membrane of the Graafian follicle ✓
- It initiates ovulation ✓

(Any 1)

(1)

4.1.4 Identification of the stage of the oestrus cycle labelled B

Pro-oestrus ✓

(1)

4.2 The female reproductive tract**4.2.1 Deposition of semen:****(a)** G ✓

(1)

(b) F/E ✓

(1)

4.2.2 Identification of the structure collecting the ripe follicle:**(a)** A ✓ Infundibulum ✓

(2)

(b) B ✓ Ampulla ✓

(2)

4.2.3 Concept of ovulation

- Process whereby the membrane containing the ripe follicle bursts with the help of LH and ✓
- the ripe ovum is released into the infundibulum ✓

(2)

4.3 The process of spermatogenesis

- 4.3.1 **Deduction on the type of cell division:**
Meiosis ✓ **Reason** - genetic material is reduced into half/diploid(2n)
changed into haploid (n)/reduction division ✓ (2)
- 4.3.2 **The stages of spermatogenesis:**
C – Formation of the spermatids ✓
D – Formation of sperm cells/spermatozoa ✓ (2)
- 4.3.3 **Part of the testes where spermatogenesis takes place**
• Tubules seminiferous ✓ (1)
- 4.3.4 **The organ where the spermatozoa achieve mobility**
• Epididymis ✓ (1)
- 4.3.5 **Similarity between spermatogenesis and oogenesis**
• Both occur through meiosis to produce haploid cells ✓
• Both produce gametes/sex cells ✓ (Any 1) (1)

4.4 Mating during oestrus

- 4.4.1 **Devices to detect oestrus in the cow**
• Pedometer ✓
• Chin-ball marker ✓
• Tail-chalking ✓
• Kamar heatmount detector ✓ (Any 3) (3)
- 4.4.2 **Sequential order of FOUR reproductive hormones that are produced by a cow**
• Progesterone ✓
• Luteotrophic hormone/LTH/prolactin ✓
• Relaxin ✓
• Oxytocin ✓ (Any 4) (4)

4.5 Embryo transfer (ET) and superovulation**4.5.1 Definition of superovulation**

- The production of a larger number of ova ✓
 - at one ovulation ✓
- (2)

4.5.2 THREE advantages of embryo transfer (ET)

- More progeny can be produced ✓
 - Higher profits due to increase in sales ✓
 - Productive lives of cows are increased ✓
 - Genetics of the herd is conserved ✓
 - Superior genes are introduced into the herd ✓
- (Any 3) (3)

4.5.3 Reason for using proven bulls

- To introduce superior/desirable genes into the herd rapidly and economically ✓
- (1)
[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150