



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2012

MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

SECTION A

QUESTION 1.1

1.1.1	A	B	C	✓✓
1.1.2	A	B	✓✓	D
1.1.3	✓✓	B	C	D
1.1.4	A	✓✓	C	D
1.1.5	A	✓✓	C	D
1.1.6	A	✓✓	C	D
1.1.7	✓✓	B	C	D
1.1.8	A	✓✓	C	D
1.1.9	A	B	C	✓✓
1.1.10	A	C	C	✓✓

(10 x 2) (20)

QUESTION 1.2

	A only	B only	A and B	None
1.2.1			✓✓	
1.2.2			✓✓	
1.2.3				✓✓
1.2.4	✓✓			
1.2.5	✓✓			

(5 x 2) (10)

QUESTION 1.3

- 1.3.1 Vitamin D/Calciferol✓✓
- 1.3.2 Papillae✓✓
- 1.3.3 Pelleting/granulation✓✓
- 1.3.4 Pistolette/insemination gun/pipette✓✓
- 1.3.5 Isolation/quarantine/separation/removal✓✓

(5 x 2) (10)

QUESTION 1.4

- 1.4.1 rumen/forestomachs/reticulum/reticulo-rumen/large stomach✓
- 1.4.2 maintenance✓
- 1.4.3 di-oestrus✓
- 1.4.4 antibodies/immunoglobulin✓
- 1.4.5 anaemia✓

(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 The digestive system of ruminants****2.1.1 THREE labelled parts**

A /reticulum/honeycomb/net stomach✓

B /rumen/large stomach✓

F/omasum/leaf stomach✓

(3)

2.1.2 TWO ideal conditions for microbial activity

- suitable/optimal/moderate/favourable temperature/ $\leq 38\text{ }^{\circ}\text{C}$ to $42\text{ }^{\circ}\text{C}$ ✓

- sufficient mineral nutrients/phosphorus/cobalt✓

- sufficient nitrogen✓

- easily digestible carbohydrates✓

- a slightly acid medium/suitable pH(5,5 to 6,5)✓

- moist✓

- anaerobic✓

- regular intake of food/nutrients✓

- removal of waste products✓

(Any 2) (2)

2.1.3 TWO functions of micro-organisms in the digestive system of ruminants

- digest cellulose/crude fibre into volatile fatty acids and gases✓

- synthesise amino acids from any nitrogenous substances/source✓

- hydrolyse proteins from the feed to form amino acids✓

- synthesis of vitamins(vitamin K and B-complex)✓

(Any 2) (2)

2.1.4 A reason for enzymatic digestion in stomach

Secretes digestive (gastric) juice✓✓

OR

Secretes enzymes responsible for enzymatic digestion✓✓

(2)

2.1.5 Adapted part in a fowl

Proventriculus/glandular stomach✓

(1)

2.2 Cross section of a villus

2.2.1 Small intestines/duodenum/ileum/jejunum✓

(1)

2.2.2 Main nutrients absorbed

A – absorption of digested carbohydrates/glucose/digested proteins/amino acids/vitamins/minerals✓

B – absorption of digested fats/fatty acids/glycerol✓

(2)

2.2.3 Suitability of villus for its function

- The villus has numerous microvilli that increase the absorption surface/large surface area✓
 - It also contains blood capillaries and the lacteal for absorption of digested nutrients✓
 - It allows constant mixing motion necessary for absorption✓
- It has a single layer of epithelial tissue ✓ (Any 2) (2)

2.3 Supplements**2.3.1 Season for supplementing and reason**

- Winter/dry season✓
- Green fodder (grass) that contain pigment (carotene) that can be transformed to vitamin A is not available in winter/dry season hence it is advisable to supplement this vitamin during winter✓ (2)

2.3.2 TWO methods of supplementing

- Injection✓
- Dosing/drenching✓
- Feed concentrates/rations✓
- Drinking water✓
- Mineral licks✓ (Any 2) (2)

2.4 Digestibility coefficient

$$2.4.1 \quad \frac{\text{Dry material intake (kg)} - \text{Dry material of manure (kg)}}{\text{Dry material intake (kg)}} \times \frac{100}{1} \checkmark$$

$$= \frac{(30 \text{ kg} - 10/100 \times 30 \text{ kg}) \checkmark - (16 \text{ kg} - 35/100 \times 16 \text{ kg}) \checkmark}{(30 \text{ kg} - 10/100 \times 30 \text{ kg})} \times \frac{100}{1}$$

OR

$$= \frac{27 \text{ kg} \checkmark - 10,4 \text{ kg} \checkmark}{27 \text{ kg}} \times \frac{100}{1}$$

OR

$$= \frac{16,6 \text{ kg} \checkmark}{27 \text{ kg} \checkmark} \times \frac{100}{1}$$

$$= 61,48\% \text{ or } 61,5\% \text{ or } 61\% \checkmark \quad (\text{Any 5}) \quad (5)$$

2.4.2 Factor determining digestibility

The higher the quantity/volume of feed taken in,✓ the lesser the time for digestion/the lower the digestibility/less time of contact with digestive enzymes✓ (2)

2.5 Nutritive ratio

$$2.5.1 \quad 75\% - 20\% = 55\% \checkmark \quad (1)$$

$$2.5.2 \quad NR = 1: \frac{\% \text{ digestible non-nitrogen substances} \checkmark}{\% \text{ digestible protein}}$$

or

$$1: \frac{75\% - 20\% \checkmark}{20\%}$$

or

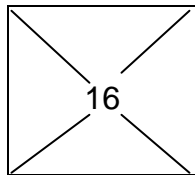
$$1: \frac{55\% \checkmark}{20\%}$$

(2)

$$1 : 2,75 \text{ or } 1 : 3 \checkmark$$

2.6 Pearson square

$$2.6.1 \quad \text{Feed A: } 14 \qquad \qquad \qquad 5 \checkmark$$



$$\text{Feed B: } 21 \qquad \qquad \qquad 2 \checkmark$$

Mix 5 **part s** of feed A with 2 **parts** of feed B or 5 : 2 ✓ (3)

$$2.6.2 \quad \text{Feed B} = \frac{2}{7} \times \frac{100 \checkmark}{1}$$

$$= 28,57\% \text{ or } 28,6\% \text{ or } 29\% \checkmark$$

(3)
[35]

QUESTION 3: ANIMAL PRODUCTION

3.1 Animal shelter

3.1.1 Production system

- Extensive farming ✓✓

Reason

- Exposure to adverse weather conditions (cold, wet and windy) ✓

OR

- Farmers did not have shelter for Angora goats and were subsidised to build one ✓

(3)

3.1.2 Reasons for the recommendations by the extension officer for the production system

(a) Shelter

- Has sides ✓ for protection against cold winds/will reduce the wind chill ✓
- Has a roof ✓ for protection against rain ✓
- Has an enclosed area ✓ that keeps heat within/insulation ✓ (Any 1)

(2)

(b) Insulation material

- Heat can be retained/protection against bitter cold ✓for a longer period of time✓ (2)

(c) Heaters

Assist in increasing✓ and maintaining/regulating temperature/reduce temperature fluctuations✓ (2)

3.1.3 Reasons for the government grant/funding

- Help the farmers to build/purchase high tech equipment✓
- To prevent job losses on the farms✓
- To ensure that foreign exchange is earned/economic stability✓
- To prevent shortage/losses of meat and mohair/to ensure sustainability✓ (Any 2) (2)

3.2 Farm animals and products**3.2.1 TWO primary products of farm animals**

- Milk✓
- Meat(beef/fish/pork/bacon/chicken/mutton)✓
- Eggs✓
- Honey✓
- Wool ✓
- Hides✓ (Any 2) (2)

3.2.2 Optimising poultry production**(a) Space requirements**

- Not overcrowded/enough space/eliminate competition✓
- Housing/production system✓
- Sufficient light✓
- Fresh air/good ventilation✓
- Cleanliness✓
- Constant optimal temperature✓ (Any 2) (2)

(b) Feeding facilities

- Functional feeding facility/allows for easy feeding/refilling✓
- Provision of clean water and feeds/access to water✓
- Feed accessible to animal/easy for animal to reach feed✓
- Limits wastage✓ (Any 2) (2)

3.2.3 Handling

- **Farm animal B** – Bigger/higher gates and fences/sides✓
- These facilities are more expensive✓
- More sophisticated handling facilities required/stronger structures needed (cables/bigger poles/pipes)✓ (Any 2)
- **Farm animal D** – small/less structures needed/easier to handle✓
Structures not so high/not so strong/normal fences✓
- These facilities are less expensive✓ (Any 2) (4)

3.3 Animal behaviour

3.3.1 TWO behavioural patterns of cattle

- Nervous✓
 - Wild/aggressive✓
 - Stressed✓
- (Any 2) (2)

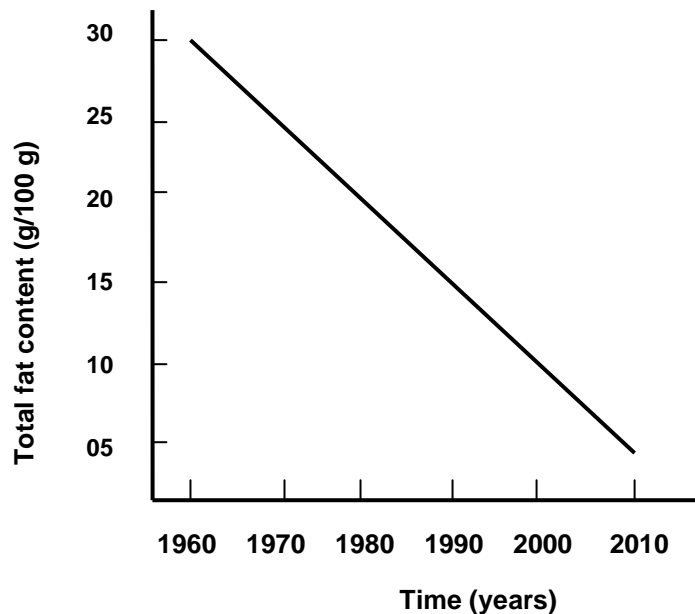
3.3.2 TWO economic benefits of good cattle management

- Better performance/production (better feed conversion ratio)✓
 - Improved reproduction rate✓
 - Improved health condition✓
 - Improved growth rate✓
 - Good quality carcass/milk/hides ✓
- (Any 2) (2)

3.4 Animal fat content research

- 3.4.1**
- Improve the carcass quality✓
 - Higher prices for their product/higher income✓
 - Meat becomes lean/most consumers prefer lean meat (lean meat is healthier)✓
- (Any 2) (2)

3.4.2 Total fat content over a period of 50 years



Marking graph with the following checklist:

Criteria	Yes: 1 Mark	No: 0 Mark
1. Line graph	1	
2. X-axis correctly labelled	1	
3. Y-axis correctly labelled	1	
4. Points are plotted correctly	1	
5. Correct heading	1	
6. Units are indicated on both axes	1	

(6)

- 3.4.3**
- Fat content decreased✓✓
 - Fat content changed from 30 g/100 g to 5 g/100 g✓✓
 - An even decrease/rate of decrease was constant✓✓
- (Any 1) (2)

[35]

QUESTION 4: ANIMAL REPRODUCTION, PROTECTION AND CONTROL**4.1 Reproductive organs of a bull****4.1.1 Reproductive parts**

A – Seminal vesicle/vesicular gland✓

B – Prostate gland✓

C – Cowper/bulbo-urethral gland✓

H – Testis✓

(4)

4.1.2 Process that occurs in K

Spermatogenesis/ sperm formation/gametogenesis✓

(1)

4.1.3 Functions

D - Transports spermatozoa/enhances ejaculation✓

L - Facilitates penetration of ovum/releases an enzyme (hyaluronidase) that allows spermatozoa to penetrate the ovum/acrosome reaction✓

(2)

4.1.4 Influence of congenital defects

- Negatively affects sperm formation/spermatogenesis/will not allow optimum spermatogenesis to take place/sperm defects✓✓

(2)

4.1.5 Reason for part H to be situated outside the abdominal cavity

Sperm production occurs at the temperature slightly (1 to 3°C) lower than that of the body/to regulate the temperature for more effective spermatogenesis✓

(1)

4.2 Progesterone and oestrogen

4.2.1 Day 7✓ & day 17✓

(2)

4.2.2 30 – 33 units ✓

(1)

4.2.3 Progesterone

Sharp increase in the level of progesterone✓

Sharp decrease in levels of oestrogen✓

(2)

4.2.4 TWO effects of oestrogen on the animal at peak period

- Thickens the lining of the uterus prepares the uterus for the implantation of the fertilised ovum/increases blood supply to the uterus✓
- Relaxes the muscles of the cervix✓
- Delays the secretion of FSH at the end of oestrus✓
- Stimulates the gland in the brain to release LH✓
- Stimulates the process of ovulation through the release of LH✓
- Leads to the display of signs of oestrus✓
- Prevents bacterial infection of the uterus✓

(Any 2) (2)

4.2.5 The corpus luteum will degenerate/burst/be resorbed/be broken down✓ (1)

4.3 Ticks as animal parasites**4.3.1 TWO economic significance of ticks**

- Transmit diseases/entry point of pathogens✓
- Production losses/skin damage ✓
- Underperformance of farm animals✓
- Loss of teat function/ear lobes/tail tips✓
- Death of farm animals✓

(Any 2) (2)

4.3.2 Three-host tick✓

Reason: Completes every stage of its life cycle on three different hosts✓ (2)

4.3.3 Reason for tick outbreak in the coastal region

Humid✓ and favourable climatic conditions✓ (2)

4.3.4 Fly specie attacking sheep

- Blowfly✓ (1)

4.3.5 Biological ways of controlling ticks

- Providing herbs✓
- Use of natural enemies/predators (ox-pecker)✓
- Breeding adaptable animals✓

(Any 2) (2)

4.4 Sheep vaccination plan

4.4.1 Weaners✓ (1)

4.4.2 3–5 months ✓ (1)

4.4.3 Protects the ewes at critical and delicate stage of gestation✓ against the enzootic abortion✓ (2)

4.4.4 Role of the state**(a) Quarantine services:**

- To prevent diseases or pests being brought into the country✓
- Strict import control measures are adopted/impose control measures on proclaimed diseases/ use law enforcement agencies (statutory measures, state vets stock inspectors) to control the movement of animals ✓

(2)

(b) Veterinary research:

- To develop better methods to diagnose and control diseases✓
- Train veterinarians✓
- Operate research stations✓
- Stock inspectors✓
- Extension services✓

(Any 2)

(2)

[35]**TOTAL SECTION B: 105**
GRAND TOTAL: 150