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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 1.41.4.1 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/ $\leq 38^{\circ}\text{C}$ to 42°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

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

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

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 NR = $1: \frac{\% \text{ digestible non-nitrogen substances}}{\% \text{ digestible protein}}$ ✓
or

1: $\frac{75\% - 20\%}{20\%}$ ✓

or

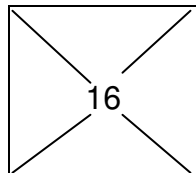
1: $\frac{55\%}{20\%}$ ✓

(2)

1 : 2,75 or 1 : 3✓

2.6 Pearson square

2.6.1 **Feed A:** 14 **5**✓



Feed B: 21 **2**✓

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

2.6.2 **Feed B** = $\frac{2}{7} \times \frac{100}{1}$ ✓
= 28,57% or 28,6% or 29%✓

(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 ✓

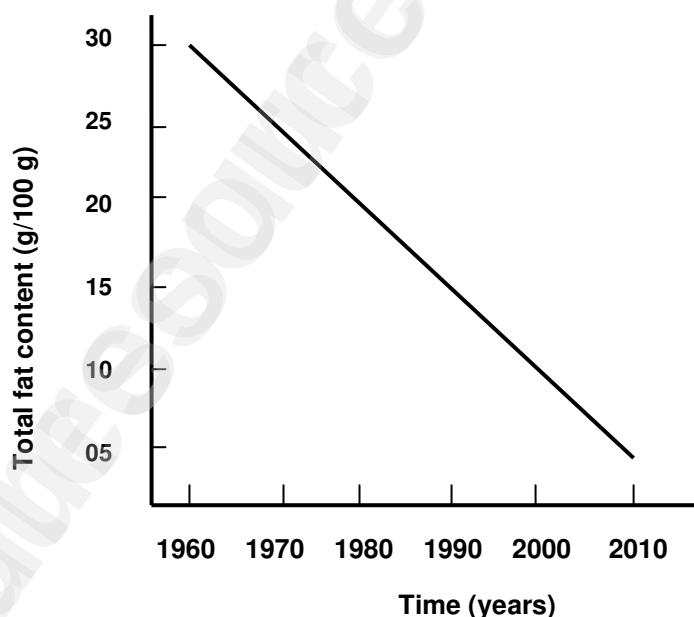
(Any 2) (2)

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:
GRAND TOTAL:****105
150**