



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

FEBRUARY/MARCH 2012

MEMORANDUM

MARKS: 150

This memorandum consists of 11 pages.

SECTION A**QUESTION 1.1**

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

(10 x 2) (20)

QUESTION 1.2

1.2.1	A✓✓
1.2.2	C✓✓
1.2.3	C✓✓
1.2.4	A✓✓
1.2.5	B✓✓

(5 x 2) (10)

QUESTION 1.3

1.3.1 Silage/green feeds ✓✓

1.3.2 Mineral licks/Lick ✓✓

1.3.3 Cross-breeding ✓✓

1.3.4 Holding pen/crush ✓✓

1.3.5 Feedlot ✓✓

(5 x 2) (10)

QUESTION 1.4

1.4.1 Cobalt ✓

1.4.2 Homogenous ✓

1.4.3 Indigenous ✓

1.4.4 Endothermic ✓

1.4.5 Subsistence ✓

(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 THE PROCESS OF RUMINATION IN RUMINANTS**

- 2.1.1 A- rumen
B- omasum (2)
- 2.1.2 Explanation of the process of rumination
 - Swallowed food (bolus) from the mouth enters the rumen (storage) through the oesophagus ✓
 - Mixing, moistening and softening by the fluid and bacterial action occurs ✓
 - Reverse/retro-peristalsis takes place and food (cud) is forced back into the mouth for rumination to occur ✓
 - The chewed food is swallowed and then fall into the reticulum (mixing of food) ✓
 - Food then passes to the omasum (drying) then into the abomasum (enzymatic digestion occurs) ✓ (Any 3) (3)
- 2.1.3 Letters that correspond with the descriptions
 (a) D ✓
 (b) C ✓
 (c) C ✓ (3)
- 2.1.4 Two functions of bacteria and protozoa in the alimentary canal
 - Synthesis of vitamins ✓
 - Synthesis of amino acids ✓
 - Digestion of cellulose ✓
 - Hydrolysis of proteins ✓ (Any 2) (2)

2.2 Digestibility of a feed

- 2.2.1 Hay :10% of 15 kg=15 kg
 15 kg -1,5 kg =13,5 kg dry material ✓
- Digestible coefficient=

$$\frac{\text{DM intake (kg)} - \text{DM of manure (kg)} \times 100}{\text{DM intake (kg)}} \checkmark$$

$$= \frac{13,5 \text{ kg} - 4 \text{ kg} \times 100}{13,5 \text{ kg}} \checkmark$$

$$= 70,4\% \checkmark$$
 (4)
- 2.2.2 The actual quantity of feed absorbed by an animal ✓ (1)
- 2.2.3
 - Crude fibre is not easily digestible/the more the crude fibre content ✓
 - hence it makes the feed to be difficult to digest/the less the digestibility of the feed becomes ✓ (2)

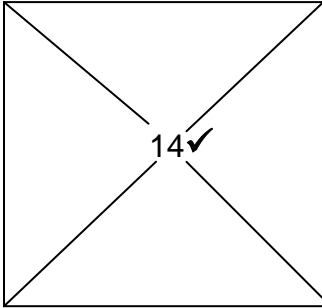
2.3 Nutritional information of selected feeds

- 2.3.1 (a) Silage ✓
(b) Lucerne ✓
(c) Maize ✓ (3)

2.3.2 Pearson square calculation

Sunflower oil cake meal
DP 38 %

14% - 8.9%
= 5,1 parts sunflower meal ✓



Maize meal
DP 8,9 %

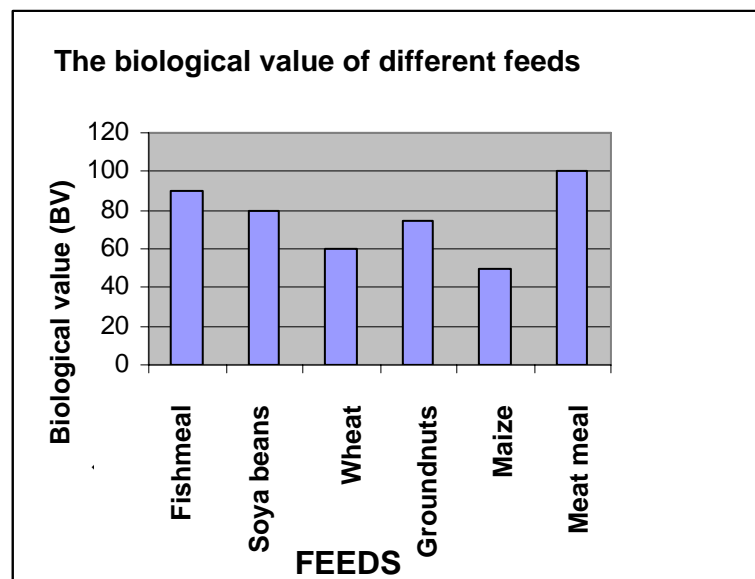
38 - 14 %
= 24 parts maize meal ✓

5,1:24 ✓✓ / Mix 5,1 parts of sunflower meal with 24 parts of maize meal ✓✓ (5)

2.4 Biological value of feedstuffs

- 2.4.1 **Description of the biological value**
- BV = is the index or a measure ✓
 - of the quality of the protein in a feed ✓
 - And gives an indication of the amino-acids in the proteins ✓
(Any 2)
- OR**
- The efficiency ✓ with which a protein supplies nitrogen/amino-acid requirement of an animal ✓ (2)
- 2.4.2 **Quality of proteins in ruminants and non-ruminants**
- Ruminants: they form their own protein from feed protein through micro organisms in the Reticulo-rumen ✓
 - When these micro organisms die, the amino acids are released and the protein become available for the ruminants ✓ (2)

2.4.3



Checklist for marking:

Criteria	Evidence No	Evidence Yes
Heading available	0	1
X-axis labelled	0	1
Y-axis labelled	0	1
Correct values (X-axis)	0	1
Correct values (Y-axis)	0	1
Bar graph	0	1

Total marks = 6

(6)
[35]

QUESTION 3: ANIMAL PRODUCTION

3.1 Influence of environmental temperatures on production

- 3.1.1
- Pigs ✓
 - They are most effected by lower temperatures (lower growth rate at lower temperatures) ✓
- (2)

3.1.2 **Methods to protect animals against extreme weather**
Cold weather

- Natural or artificial shelter with heaters/infra red lights and fans can be used for extreme cold conditions ✓ (Any 1)

Hot weather

- High temperatures: large fans/sprinklers/foggers that disperse very fine droplets of water/misters or showers ✓ (Any 1) (2)

3.1.3 Advantages of constant body temperature

- The metabolic rate of the animal is now kept at a constant level ✓
- And not dependant on the environmental temperatures ✓
- This will lead to a more effective utilisation/digestion/assimilation/absorption of feed in the body for production ✓
- Although it requires more feed to be utilised under extreme temperature conditions ✓
- Enzymes in the body function at optimal levels at different temperature conditions ✓
- As the body temperature is kept at the optimal temperatures for these enzymes to function ✓ (Any 2) (2)

3.1.4

- Cow ✓
- Is bigger than the pig and less heat loss in ratio with body size ✓
- Micro-organisms and rumen (fermentation) generate more heat ✓
- Pigs that are smaller have a bigger surface in relation with its volume ✓
- More heat radiation ✓ (Any 2) (2)

3.2 Poultry production in South Africa**3.2.1 Two types of production systems**

- Extensive ✓
- Intensive ✓ (2)

3.2.2 Three factors to consider when constructing an animal shelter

- Location ✓
- Design ✓
- Type of animal ✓
- Material ✓
- Layout ✓ (Any 3) (3)

3.2.3 Factors determining behaviour of farm animals

- Breed tameness ✓
- Type of animal breed ✓
- Age of animal ✓
- Physiological and health status of an animal ✓
- Frequency of handling ✓
- Facilities and equipment used ✓
- Prevailing environment ✓ (Any 2) (2)

- 3.2.4 **Characteristics displayed by animals to indicate fear, aggression and contentment**
- Raised or pinned ears
 - Raised tail
 - Raised back hair ✓
 - Bared teeth ✓
 - Pawing the ground ✓
 - Snorting ✓
 - Wild look in the eyes ✓
 - Screaming/bellowing ✓
 - Fast movements/excessive movements ✓
 - Scratching with hooves on ground ✓
 - Fast breathing rate ✓
 - Unfamiliar behaviour ✓
- (Any 2) (2)
- 3.3 **Enterprise systems**
- 3.3.1 Structure (a) - 2✓ (1)
(b) - 1✓ (1)
- 3.3.2 **Characteristics of production system marked 2**
- Animals graze freely in camps ✓
 - Less capital intensive ✓
 - Few labourers needed ✓
 - Little human interference ✓
 - Free animal movement ✓
 - Minimal control and supervision of animals ✓
 - Animals kept in low density ✓
 - Large area utilized for production purpose ✓
- (Any 2) (2)

3.3.3 Comparison of production system marked 2 and 3

ASPECT	PRODUCTION SYSTEM 2	PRODUCTION SYSTEM 3
(a) Environmental control	Minimal or no control of the environment ✓	Environmental conditions controlled to suit the animals ✓
(b) Drought risk	High drought risk/animals travel long distances in search for fodder and water ✓	No drought risk/water is supplied/provided all the times ✓
(c) Production output	Relatively low production output/dependent on availability of natural grazing/dependant on environmental conditions/rainfall ✓	High animal production output/optimal/maximum production output/not dependant on environmental conditions/environmental control ✓

(6)

3.4 Effect of crude fibre on quality/quantity of milk produced

3.4.1 Describe the effect of crude fibre on the fat content

- The higher the quantity of crude fibre taken in by cows ✓
- the higher the fat content becomes in the milk ✓

(2)

3.4.2 Prediction of the effect of crude fibre on milk yield

- At lower crude fibre content values the quantity of milk is high (from month 4) ✓
- At higher crude fibre values the milk production becomes less (up to month 7) ✓

(2)

3.4.3 • The disease developed at month 8/just after month 7 ✓

- There was a drastic drop in milk production ✓

(2)

3.4.4 • Full recovery/animal recovered ✓

- The animal completely recovered as the milk production increased to a possible projected value ✓

(2)

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QUESTION 4: ANIMAL REPRODUCTION, PROTECTION AND CONTROL**4.1 Oestrus cycle****4.1.1 THREE changes that take place with the follicle during the oestrus**

- Follicle becomes bigger/grows/enlarged ✓
- Ovum develops in the follicle ✓
- Ovulation takes place/ovum is released ✓
- Corpus Luteum develops ✓

(Any 3) (3)

4.1.2 (a) Progesterone

- Prepare the uterus for the reception of the fertilised ovum ✓
Supporting the attachment of the embryo ✓
- Maintain pregnancy ✓

(Any 1) (1)

(b) Oestrogen

- Characteristics of oestrus ✓
- Increased blood supply to uterus to prepare it for the reception of the fertilised ovum ✓

(Any 1) (1)

4.2 Physiological causes of infertility**4.2.1 Anoestrus**

- Show no signs of oestrus ✓
- Bull is totally unaware that the heifer/cow is in oestrus ✓

(2)

4.2.2 b) Infantilism

- Ovaries and other general organs are underdeveloped ✓
- No follicles develop and no estrogen can be secreted ✓

(2)

4.3 Development of the foetus**4.3.1 Functions of the placenta**

- Attaches embryo to the uterus wall ✓
- Brings the blood vessels of the mother and embryo close together ✓
- Allows nutrients, gases, antibodies and wastes to be excreted ✓

(Any 2) (2)

4.3.2 (a) Mummification ✓

(1)

(b) Maceration ✓

(1)

4.4 Foot-and-mouth disease

4.4.1 Meat from infected animals cannot be marketed/infected animals may be killed and carcass not used/stock loss✓ (1)

4.4.2 TWO control measures of foot-and-mouth disease

- Quarantine animals ✓
- Isolate infected animals ✓
- Control movement of infected ✓
- Kill infected animals ✓
- Report to the veterinarian or stock inspector ✓ (Any 2) (2)

4.4.3 Three main types of livestock affected by foot-and-mouth disease:

- Cattle ✓
- Sheep ✓
- Goats ✓
- Pigs ✓ (Any 3) (3)

4.4.4 Symptoms of Foot-and-Mouth disease

- Sores in the mouth, on the tongue, and between hooves ✓
- Excess saliva (spit) secreted from the mouth ✓
- Animals eat less food/decrease in appetite ✓
- Animals walk as if they have sore feet ✓
- Animals are weak ✓ (Any 3) (3)

4.5 CONTROL OF TICKS IN CATTLE

4.5.1

- More adult ticks are treated and fewer eggs are produced ✓
- Eggs that precede to the larvae and nymph stages are prevented from reaching the adult stage✓
- Areas that are highly infested are aggressively treated/no chance of genetic inheritance✓
- It breaks the resistance to the normal active chemical substance✓
- It is a systemic chemical tick control measure✓ (Any 2) (2)

4.5.2 Two measures for prevention of resistance to acaricides

- Specific chemicals should not be repeatedly used so that ticks cannot develop resistance ✓
- Sufficient strength dip mixtures should be used ✓
- Breeding genetically modified breeds that are resistant to the ticks✓ (Any 2) (2)

- 4.5.3 **Two ways to deal with tick resistance**
- The farmer should breed animals that are resistant to the ticks and avoid using miticides ✓
 - The farmers can biologically control the ticks using oxpeckers ✓ (2)
- 4.5.4 During March and April ✓ (1)
- 4.5.5
- Burning the veld/pastures ✓
 - Dipping the animals regularly ✓
 - Resting some camps for long periods ✓ (Any 2) (2)

4.6 **Internal parasites**

- 4.6.1
- Animals lose condition under good feeding conditions ✓
 - Manure is watery ✓
 - Tail areas are dirty ✓
 - Swollen area under the jaw ✓ (Any 2) (2)
- 4.6.2
- Wet condition/broken drinking trough ✓
 - Summer conditions/warmer weather ✓
 - Water-logged fields/marshy areas ✓ (Any 2) (2)

[35]

TOTAL SECTION B: 105
GRANDTOTAL: 150