



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

FEBRUARY/MARCH 2018

MARKING GUIDELINES

These marking guidelines consist of 10 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	D ✓✓		
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	B ✓✓		
	1.1.5	C ✓✓		
	1.1.6	C ✓✓		
	1.1.7	A ✓✓		
	1.1.8	A ✓✓		
	1.1.9	B ✓✓		
	1.1.10	A/B ✓✓	(10 x 2)	(20)
1.2	1.2.1	B only ✓✓		
	1.2.2	Both A and B ✓✓		
	1.2.3	A only ✓✓		
	1.2.4	None ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Ptyalin/amylase ✓✓		
	1.3.2	External/ecto- parasites ✓✓		
	1.3.3	Bedding/litter ✓✓		
	1.3.4	Superovulation ✓✓		
	1.3.5	Mitochondria ✓✓	(5 x 2)	(10)
1.4	1.4.1	Nitrogen/Protein ✓		
	1.4.2	Removal Certificate/Permit ✓		
	1.4.3	Splitting ✓		
	1.4.4	Mesoderm ✓		
	1.4.5	Testosterone ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canal of a farm animal****2.1.1 Letter of the structure of cellulose digestion**

A ✓

(1)

2.1.2 Cellulose digesting enzyme

Cellulase ✓

(1)

2.1.3 TWO requirements of the organisms in the part A

- Easily digestible carbohydrates
- Regular intake of food for fermentation ✓
- Sufficient mineral nutrients(Na/Cu/Co/P) ✓
- Anaerobic/oxygen free environment ✓
- Presence of CO₂ ✓
- Sufficient nitrogen ✓
- Suitable pH/slightly acidic pH/pH of 5,5 to 6,5 ✓
- Warm environment/temperature of 38-42⁰c ✓
- Continual elimination of end products ✓
- Osmotic condition/moist environment ✓

(Any 2)

(2)

2.1.4 The type of digestion in part D

Chemical/enzymatic digestion ✓

(1)

2.1.5 Reason for the answer

Part D secretes digestive juices/enzymes ✓

(1)

2.2 Available animal feeds**2.2.1 Classification of FEED A and FEED C****Feed A** - Concentrate ✓

(1)

Feed C - Roughage ✓

(1)

2.2.2 Letters recommended for each situation**(a)** B ✓

(1)

(b) D ✓

(1)

(c) A ✓

(1)

(d) C ✓

(1)

2.2.3 Justification of better digestion of feed B when ground

- Ground feed/maize has smaller particles with an increased surface area ✓
- for more exposure to enzymes and better digestion ✓

(2)

2.3 Feed trial**2.3.1 Calculation of the digestibility co-efficient of hay**

$$= \frac{11,5\text{kg}}{24\text{kg}} \times 100 \checkmark$$

$$= 47,9 \checkmark \% \checkmark$$

(3)

2.3.2 Stage the hay was cut

It was cut later in the season when it was old/matured ✓

(1)

2.3.3 Reason based on the calculated value

- Only 47,9% of the hay was digested and absorbed ✓
- The hay was hard/lignified/with a high crude fibre content/less/poorly/difficult to digest ✓

(2)

2.3.4 TWO supplementary substances to improve digestibility of hay

- Non-protein nitrogen/NPN/urea/biuret ✓
- Molasses ✓
- Caustic soda ✓

(Any 2) (2)

2.4 Fodder flow plan**2.4.1 TWO months when feed was insufficient**

- April ✓
- May ✓
- June ✓

(Any 2) (2)

2.4.2 TWO reasons

- The need is higher than the supply/there is a shortage ✓
- Supplementary feeding is provided ✓

(2)

2.4.3 Total quantity of the supplementary feed in May

Supplementary feed(kg/animal) x number of days in May x number of animals

$$= 2 \text{ kg} \times 31 \times 50 \checkmark$$

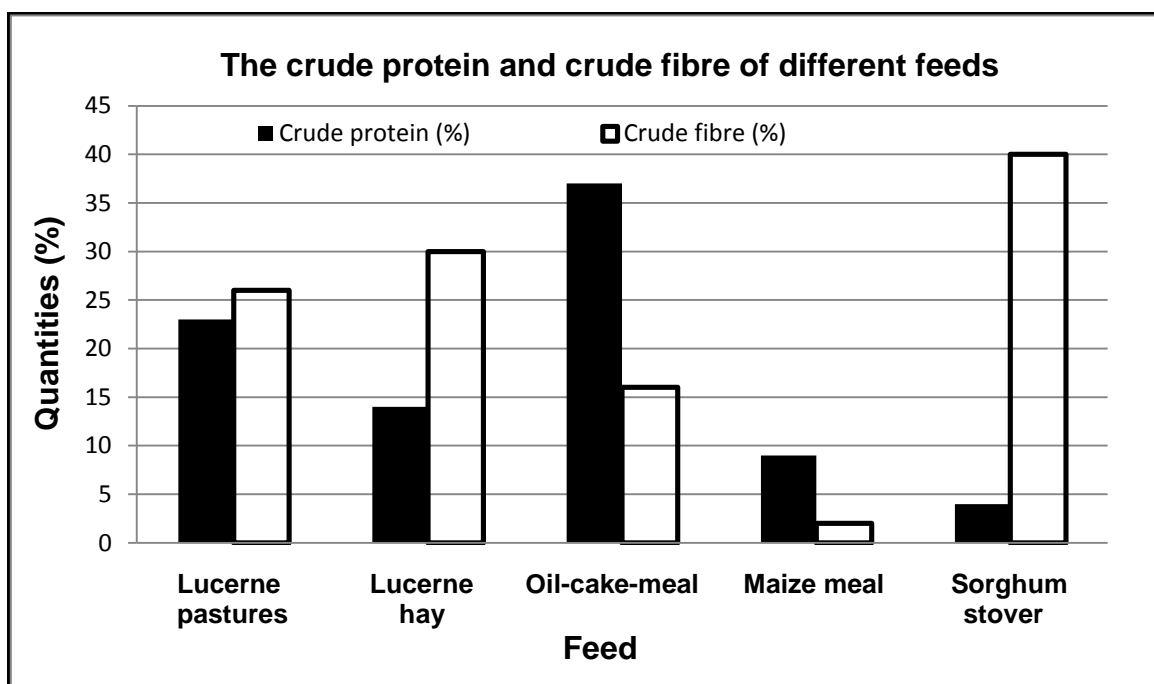
$$= \frac{3100 \text{ kg}}{1000} \checkmark$$

$$= 3,1 \text{ tons} \checkmark$$

$$= 3,1 \text{ tons} \checkmark$$

(3)

2.5 Bar graph showing the crude fibre and crude protein of the different feeds



Criteria/rubric/marketing guidelines

- Correct heading ✓
- Y axis - correctly calibrated and labelled (Quantities) ✓
- X axis - correctly calibrated and labelled (Feed) ✓
- Correct unit (%) ✓
- Bar graph ✓
- Accuracy ✓

(6)
[35]

QUESTION 3 ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Production systems

3.1.1 Identification of the TWO production systems represented by A and B

A - Intensive production system ✓

(1)

B - Extensive production system ✓

(1)

3.1.2 Comparison of the TWO production systems

(a) Method of feeding

- Intensive production system - feed is provided to animals ✓
- Extensive production system - animals graze/look for food ✓

(2)

(b) Space per production output

- Intensive production system - more production per area ✓
- Extensive production system - less production per area ✓

(2)

- 3.2 The feeding and temperature requirements at different stages**
- 3.2.1 Main nutrient for broilers**
Proteins ✓ (1)
- 3.2.2 Importance of the nutrient element**
- Need protein for muscle and tissue growth ✓
 - Act as antibodies that provide immunity ✓
 - Collagens support tendons, ligaments and a beak ✓
 - Controls body fluid balance and muscle contraction ✓
 - Repair worn out tissues ✓ (Any 1) (1)
- 3.2.3 Reason for the inclusion of carbohydrates in a finisher mash**
Need carbohydrates for fattening/rounding off ✓ (1)
- 3.2.4 The relationship between protein level, temperature requirements and the age**
The younger the broilers ✓ the higher the protein level of the feed ✓
and the higher the temperature requirement ✓
OR
The older the broilers ✓ the lower the protein level of the feed ✓
and the lower the temperature requirement ✓ (3)
- 3.3 Tools used for animal identification purposes**
- 3.3.1 Branding iron ✓ (1)
- 3.3.2 Ear tag ✓ (1)
- 3.3.3 Smart neck band ✓ (1)
- 3.3.4 Tattoo pliers ✓ (1)
- 3.4 Handling facilities for specified operations**
- 3.4.1 Identification of the facility**
Loading/off- loading ramp ✓ (1)
- 3.4.2 Use of the facility**
For loading/off-loading animals ✓ (1)
- 3.4.3 TWO design features of the facility**
- High and strong walls ✓
 - Width according to the type of animal ✓
 - Angle not too steep ✓
 - Not slippery ✓ (Any 2) (2)
- 3.4.4 TWO forms of harm to an animal during the handling process**
- Physical/injuries ✓
 - Stress/emotional ✓ (2)

3.5 Parasites in farm animals**3.5.1 The TWO parasites**

- A** - External parasite/ecto-parasite ✓ (1)
B - Internal/endo-parasite ✓ (1)

3.5.2 Motivation from the diagram

- A** - Larvae attaches itself onto the skin ✓ (1)
B - Worms are swallowed and bore through the intestines into the liver ✓ (1)

3.5.3 Preventative measure against parasite B

- Avoid grazing in swampy areas/fencing off affected areas/removal of dung ✓
 - Drinking spots should be kept dry ✓
 - Rotational grazing ✓
 - Breeding genetically resistant animals ✓
 - Treat affected areas ✓
 - Veld burning ✓
 - Use of feeders ✓
 - Provision of clean drinking water ✓
 - Provision of good nutrition ✓
 - Proper management of the breeding season/calving ✓
- (Any 1) (1)

3.6 Animal diseases**3.6.1 Scientific term for animal health conditions**

- (a)** Contagious/infectious diseases ✓ (1)
(b) Vector ✓ (1)

3.6.2 ONE bacterial disease that can be transmitted to the next animal

- Tuberculosis ✓
 - Anthrax ✓
- (Any 1) (1)

3.6.3 Role of the farmer

- Quarantine/isolation of sick animals ✓
 - Regular inspections/monitoring for the presence of disease
 - Vaccination/inoculation ✓
 - Treatment of sick animals ✓
 - Burning/burying carcass of infected animals ✓
 - Report to the authorities ✓
- (Any 1) (1)

3.6.4 TWO measures how farm workers can be exposed to animal diseases

- Exposure to/contact with infected animals ✓
 - Use of unsterilized equipment ✓
- (2)

- 3.6.5 **TWO roles of the state in controlling the spread of infectious diseases**
- Production of vaccines ✓
 - Setting up quarantine areas/zones ✓
 - Research ✓
 - Publications ✓
 - Import/export bans/control measures/movement permits ✓
 - Veterinary services ✓
- (Any 2) (2)
[35]

QUESTION 4: ANIMAL REPRODUCTION

4.1 The diagram of a sperm cell

- 4.1.1 **Identification of part A**
Acrosome ✓ (1)
- 4.1.2 **The function of the part**
- (a) **A** - Facilitate penetration of the sperm cell into the ovum/protects the head of the sperm cell ✓ (1)
- (b) **B** - Transmission of DNA/genetic material/information ✓ (1)
- (c) **D** - Mobility/movement of the sperm cell ✓ (1)
- 4.1.3 **Distinction between sperm cell and semen**
- Sperm cell** - Male gamete/reproductive cell for fertilisation ✓ (1)
- Semen** - Mixture of sperm cells and the fluids from the accessory glands ✓ (1)
- 4.1.4 **The female reproductive cell**
Ovum/egg cell/female gamete ✓ (1)

4.2 Foetus development in cattle

- 4.2.1 **Identification of parts B and F**
- B** - Allantois ✓ (1)
- F** - Umbilical cord ✓ (1)
- 4.2.2 **The function of part D**
- Protection for the foetus/shock absorber ✓
 - Lubricates the birth canal ✓
 - Regulates temperature around foetus ✓
 - Prevents dehydration ✓
- (Any 1) (1)
- 4.2.3 **Conditions associated with pregnancy**
- (a) Mummification ✓ (1)
- (b) Maceration ✓ (1)
- (c) Abortion ✓ (1)
- (d) Placenta retention ✓ (1)

4.3 Dairy farmer with 100 cows and one bull**4.3.1 Identification of the problem in this enterprise**

- Bull: cow ratio not proportional/1 bull to 100 cows ✓
- The calving percentage is too low/conception rate problems ✓

(Any 1) (1)

4.3.2 Scientific technique that will result in a higher calving percentage

Artificial insemination/AI ✓

(1)

4.3.3 Other method to improve the calving percentage

Make use of more bulls/3–5 bulls ✓

(1)

4.3.4 Impact of nutrition on the fertility of bulls

- Underfeeding impacts negatively on spermatogenesis/sperm formation/volume/quality of semen ✓
- Overfeeding causes bulls to become fat/heavy/lazy reducing the ability to service cows(libido) ✓

(2)

4.3.5	TWO other reasons for this bull performing poorly		
	<ul style="list-style-type: none"> • Over exertion/exhaustion ✓ • Old age ✓ • Lack of libido ✓ • Conformational abnormalities ✓ • Inability to fertilise/low sperm count ✓ 	(Any 2)	(2)
4.4	Milk production of a dairy cow for one year		
4.4.1	Term for the graph illustrated Lactation curve ✓		(1)
4.4.2	Indication of the letter		
	(a) H ✓		(1)
	(b) A ✓		(1)
	(c) B ✓		(1)
	(d) D ✓		(1)
4.4.3	Reasons for the drop in the milk production between point F and point G		
	<ul style="list-style-type: none"> • Illness/the cow was sick/disease ✓ • Injury ✓ • Adverse/bad environmental conditions ✓ • Malnutrition/over/under feeding ✓ • The cow is about to dry off ✓ 	(Any 2)	(2)
4.5	Oestrus in dairy cows		
4.5.1	Definition of oestrus in dairy cows		
	<ul style="list-style-type: none"> • Period when non-pregnant cows show visible signs of oestrus ✓ • and will allow mating to take place ✓ 		(2)
4.5.2	Visible signs of oestrus in dairy cattle		
	<ul style="list-style-type: none"> • Mucus discharge from the vulva ✓ • Vulva is red/moist/swollen ✓ • Restless/bellows/excited ✓ • Feed/saliva on the back/hair is fluffed up ✓ • Feed intake decreases/loss of appetite ✓ • Milk production decreases ✓ • Sniffs the genitalia of other cows ✓ • Raises her head and curls her lips ✓ • Cows goes to the bull and allows mating ✓ 	(Any 2)	(2)
4.5.3	Cow in oestrus Cow A/B ✓		(1)
4.5.4	Oestrus		
	(a) Oestrogen ✓		(1)
	(b) 21 days ✓		(1)
			[35]
		TOTAL SECTION B:	105
		GRAND TOTAL:	150