



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2016

MEMORANDUM

MARKS: 150

This memorandum consists of 9 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	B ✓✓		
	1.1.2	A ✓✓		
	1.1.3	C ✓✓		
	1.1.4	C ✓✓		
	1.1.5	D ✓✓		
	1.1.6	D ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	B ✓✓		
	1.1.10	C ✓✓	(10 x 2)	(20)
1.2	1.2.1	A only ✓✓		
	1.2.2	None ✓✓		
	1.2.3	Both A and B ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Polyneuritis ✓✓		
	1.3.2	Intermediary/intermediate host ✓✓		
	1.3.3	Anterior ✓✓		
	1.3.4	Eucleating ✓✓		
	1.3.5	Pedometer ✓✓	(5 x 2)	(10)
1.4	1.4.1	Feed Conversion Ratio ✓		
	1.4.2	Infectious/contagious ✓		
	1.4.3	Donor/superior ✓		
	1.4.4	Dry ✓		
	1.4.5	Prolapsed vagina/prolapse ✓	(5 x 1)	(5)
TOTAL SECTION A:			45	

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canal of farm animals**

- 2.1.1 **Identification of a non-ruminant animal**
• Animal 2 ✓ (1)
- 2.1.2 **Reason**
It does not have a complex stomach/has simple stomach ✓ (1)
- 2.1.3 **Type of feed in ration of animal 1**
Roughage ✓ (1)
- 2.1.4 **ONE reason for the feeding a roughage**
• Has a higher crude fibre/cellulose content needed for the activity of rumen micro flora ✓ (1)
- 2.1.5 **Letter representing a part enabling the digestion of roughage**
• A ✓ (1)
- 2.1.6 **Explanation of the role of parts D and E in digestion**
• **Part D** – Contains enzymes for digestion of grain feed ✓ (1)
• **Part E** – Helps to soften and moistens grain feed ✓ (1)

2.2 Energy flow in an animal

- 2.2.1 **Completion of representation**
• **A** – Metabolic energy ✓ (1)
• **B** – Faeces ✓ (1)
• **C** – Body Heat ✓ (1)
- 2.2.2 **Energy as final combustion heat released during oxidation**
GE/Gross energy ✓ (1)
- 2.2.3 **Formula to work out digestible energy**
 $DE = \text{gross energy} - \text{energy lost in faeces}$ ✓ (1)
- 2.2.4 **TWO reasons for the importance of net energy**
• Needed for production ✓ (2)
• Needed for maintenance ✓

2.3 Biological values of feeds**2.3.1****Feeds and reasons**

- (a) Fishmeal ✓ (1)

Reason

It has the highest BV(90)/essential amino acids needed for growth ✓ (1)

- (b) Maize ✓ (1)

Reason

It has the highest energy value/energy value of 80 that is needed for fattening ✓ (1)

- (c) Barley ✓ (1)

Reason

They need feed with a low BV/BV of 50/energy value of 60% necessary for maintenance ✓ (1)

2.3.2 Reason for high BV in lucerne over barley

- Lucerne is a legume crop that is rich in proteins ✓
- Barley is a non-legume which is poor in proteins/rich in carbohydrates ✓ (2)

2.4 Fodder flow programme**2.4.1 Total feed needed for the year:****Need for the dry season**

Need per animal/day x number of animals x 30 days x 6 months

- 15 kg x 30 animals x 30 days x 6 months ✓

- = 81 000 kg ✓

Need for the whole year = Rainy season need + Dry season need

- 108 000 kg + 81 000 kg = 189 000 kg ✓ (3)

2.4.2 Total amount available for the dry season

- 0,15 x 1000 x 42 x 6 ✓

- = 37 800 kg ✓ (2)

2.4.3 Feed flow problem for the farmer during the dry season

Need of feed exceeds the available resources/shortage as 37 800 kg ✓ available compared to 81 000 kg need for the animals ✓ (2)

2.4.4 Sustainable measure to correct the shortage

- Cutting fodder during rainy season ✓
- Storage of fodder for dry season ✓
- Culling/stock reduction ✓ (Any 1) (1)

2.5 **Balanced ration**

2.5.1 **Amounts of maize and sunflower oilcake in 600kg**

- Maize = $\frac{61.29 \times 600 \text{ kg}}{100}$ ✓
= 367.74 kg ✓
- Sunflower oilcake = $\frac{38.71 \times 600 \text{ kg}}{100}$ ✓
= 232.26 kg ✓

(4)

2.5.2 **Feed constituting 19 parts**

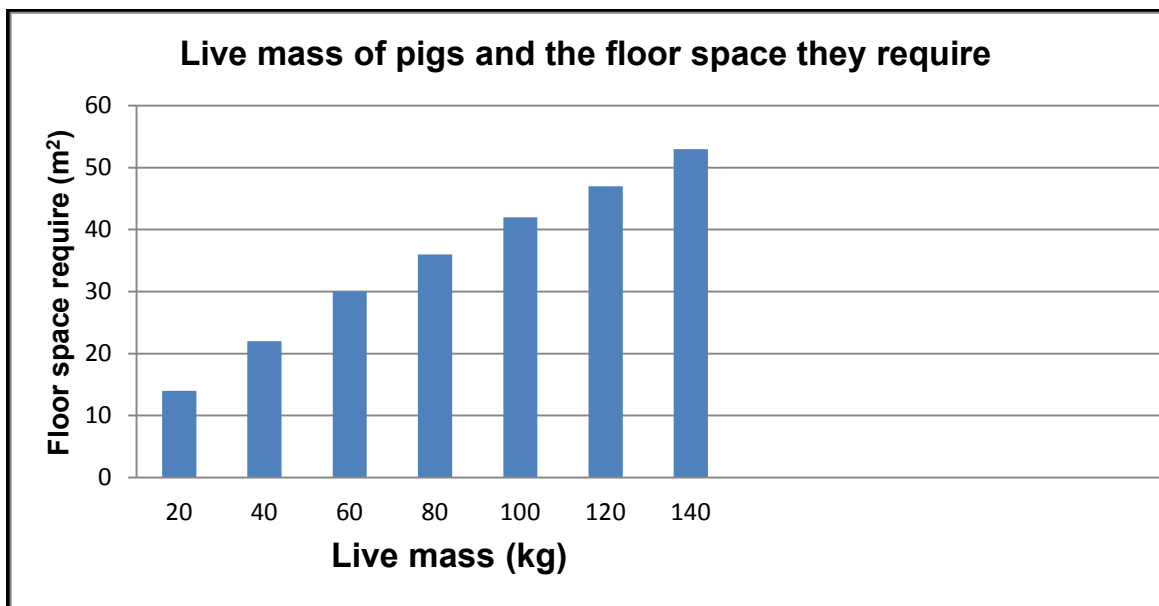
Maize meal ✓

(1)
[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Floor space required by pigs**

3.1.1 **Bar graph**



Criteria/rubric/marketing guidelines

- Correct heading ✓
- X-axis – correct calibrations and labelled (Live mass) ✓
- Y-axis – correct calibrations and labelled (Floor space required) ✓
- Both units are correct unit (m²/kg) ✓
- Bar graph ✓
- Accuracy ✓

(6)

3.1.2 **Trend between floor space required and live mass**

- The increase in live mass ✓ leads to
- Increase in floor space required ✓

(2)

- 3.2 Apparatus used for procedures in animal production system**
- 3.2.1 **Identification of the apparatus**
Illustrator/rubber ring ✓ (1)
- 3.2.2 **TWO management practices for the use of the apparatus**
- Tail docking ✓
 - Castration ✓ (2)
- 3.2.3 **ONE reason for the importance of each practice**
- Tail docking**
- Hygienic purposes/prevention of blowfly attacks ✓
 - Better reproduction ✓ (Any 1)
- Castration**
- For better breeding purposes
 - All the inferior male animals are castrated ✓ (2)
- 3.3 Loading and transportation of farm animals**
- 3.3.1 **Facility to direct animal**
Crush ✓ (1)
- 3.3.2 **TWO measures to design a crush**
- Should have high/strong/solid sides in order to prevent animals from seeing out ✓
 - Should have single/narrow curves that are not sharp ✓
 - Nothing that can harm/hurt/cause injury to animals should be included ✓ (Any 2) (2)
- 3.3.3 **Document needed to transport animals**
Permit ✓ (1)
- 3.3.4 **TWO precautionary measures to reduce stress in animals**
- Keep animals to be transported together for 2 or 3 days ✓
 - Group animals of the same size/sex/age together ✓ (2)
- 3.4 Life cycle of a blowfly**
- 3.4.1 **Name of the parasite**
Blowfly ✓ (1)
- 3.4.2 **Harmful stage in the life cycle**
Larval stage ✓ (1)
- 3.4.3 **Condition caused by larval stage**
Blowfly strike/attacks ✓ (1)
- 3.4.4 **Term used for removal of wool**
Crutching ✓ (1)

3.4.5 **THREE non-chemical management practices to control parasite infestation**

- Correct timing of shearing and crutching ✓
 - Clipping and cleaning of wool ✓
 - Tail docking ✓
 - Lambing time after shearing ✓
 - Breeding and selection of resistant breeds ✓
- (Any 3) (3)

3.5 **Plant poisoning**

- 3.5.1 Feed them before transporting ✓ (1)
- 3.5.2 Inspection of hay for fusarium/fungi ✓ (1)
- 3.5.3 Practise rotational grazing ✓ (1)

3.6 **Animal diseases**

- 3.6.1 **Type of pathogen**
Virus ✓ (1)

- 3.6.2 **Common characteristic**
Both are contagious/deadly ✓
Both are enzootic ✓ (Any 1) (1)

- 3.6.3 **TWO roles of state in controlling the spread of diseases**
- Public awareness/notify public ✓
 - Import/export bans ✓
 - Supplying veterinary services ✓
 - Setting of quarantine zones ✓
- (Any 2) (2)

- 3.6.4 **TWO economic implications of diseases**
- Export bans affect economy ✓
 - Job loss ✓
 - Financial implications/millions of rands lost ✓
 - Cost/time/labour of medication ✓
 - Suspension of production ✓
- (Any 2) (2)
- [35]**

QUESTION 4: ANIMAL REPRODUCTION**4.1 Graph showing volume and concentration of semen in animals****4.1.1 Concentration of semen at volume of 6ml**

- 1 billion/ml ✓ (1)

4.1.2 Correlation**Dairy cattle**

- Dairy bulls produce a lot of semen ✓ that is less concentrated ✓ (2)

Sheep

- Sheep produce less semen ✓ that is highly concentrated ✓ (2)

4.2 Semen colour and quality**4.2.1 Reason for the colour of semen**

- (a) Presence of fresh blood ✓ (1)
- (b) Presence of old blood/infection ✓ (1)

4.2.2 TWO negative effects on quality of semen

- Poor nutrition ✓
- Severe environmental conditions/temperature ✓
- Age ✓
- Diseases ✓ (Any 2) (2)

4.3 Techniques to increase number of offspring

- 4.3.1 (a) Cloning ✓ (1)
- (b) Embryo Transplantation ✓ (1)
- (c) Artificial insemination ✓ (1)
- (d) Cloning ✓ (1)

4.3.2 Correct stage of insemination

- Oestrus ✓ (1)

4.3.3 Relationship between ovulation and insemination timing

- AI should be performed approximately 6–14 hours before ovulation ✓
- That gives time for semen to move to the fallopian tube ✓
- So that the ovum does not wait too long before fertilisation ✓ (3)

4.4 Multiple births**4.4.1 Types of twins in representation A and B**

- **A** Dizygotic twin ✓
- **B** Monozygotic twin ✓ (2)

4.4.2 Justification

- **A** – two eggs fertilised to produce two different offspring ✓
- **B** – one egg cell fertilised to produce two similar offspring ✓ (2)

4.4.3	Process in representation B Cleavage of the same zygote ✓	(1)
4.4.4	Reason for the gender of the twins in representation A Fertilisation of two separate ova ✓	(1)
4.4.5	THREE factors for multiple births <ul style="list-style-type: none"> • Fertility/genetics ✓ • Environmental factors ✓ • Breed type ✓ • Nutrition ✓ 	(Any 3) (3)
4.5	Foetal position	
4.5.1	Identification of parturition stage Preparatory ✓	(1)
4.5.2	Appropriate scientific name for calving difficulty Dystocia ✓	(1)
4.5.3	TWO actions to save a calf and the cow <ul style="list-style-type: none"> • Correcting the position before calving ✓ • Veterinary section if position cannot be corrected ✓ 	(2)
4.6	Milk ejection	
4.6.1	TWO stimuli by the milker <ul style="list-style-type: none"> • Washing of udder ✓ • Massage of the udder ✓ • Appearance and sound of the milker ✓ • Milking action ✓ 	(Any 2) (2)
4.6.2	Hormone for milk ejection Oxytocin ✓	(1)
4.6.3	Hormone inhibiting milk ejection Adrenalin ✓	(1)
4.6.4	Bacterial disease affecting the udder Mastitis ✓	(1)
		[35]
	TOTAL SECTION B:	105
	GRAND TOTAL:	150