



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**AGRICULTURALSCIENCES P1
NOVEMBER 2016
MEMORANDUM**

MARKS: 150

Seloane MA
Internal moderator
27/11/2016

Approved
SM Gwensu
Umalusi
27-11-2016

This memorandum consists of 10 pages.

DEPARTMENT OF BASIC
EDUCATION
PRIVATE BAG X396, PRETORIA 2001

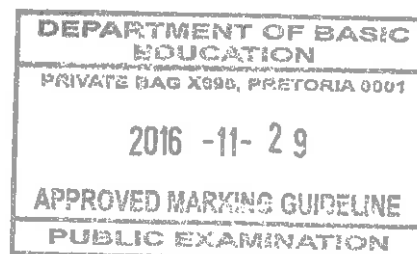
2016 -11- 29

APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Approved
Dr FE Khumalo
Umalusi
27/11/2016
Please turn over

SECTION A**QUESTION 1**

1.1	1.1.1	B ✓✓	(10 x 2)	(20)
	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 ✓✓		
1.2	1.2.1	A only ✓✓	(5 x 2)	(10)
	1.2.2	Both A and B ✓✓		
	1.2.3	Both A and B ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	A only ✓✓		
1.3	1.3.1	Polyneuritis/star-gazer ✓✓	(5 x 2)	(10)
	1.3.2	Intermediary/intermediate/secondary host ✓✓		
	1.3.3	Anterior/cranial ✓✓		
	1.3.4	Enucleating/cloning ✓✓		
	1.3.5	Pedometer ✓✓		
1.4	1.4.1	Feed Conversion Ratio/FCR ✓	(5 x 1)	(5)
	1.4.2	Infectious/contagious/viral ✓		
	1.4.3	Donor/superior ✓		
	1.4.4	Dry ✓		
	1.4.5	Prolapsed vagina/prolapse ✓		
TOTAL SECTION A:			45	



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SECTION B**QUESTION 2: ANIMAL NUTRITION**

- 2.1 Alimentary canal of farm animals**
- 2.1.1 Identification of a non-ruminant animal**
Farm animal 2 ✓ (1)
- 2.1.2 Reason**
- It does not have a complex stomach ✓
 - It has a simple/single/one/monogastric stomach ✓ (Any 1) (1)
- 2.1.3 Type of feed in ration of animal 1**
Roughage ✓ (1)
- 2.1.4 ONE reason for the feeding a roughage**
It has a higher crude fibre/cellulose content required 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 - Helps to soften/moisten grain feed ✓ (1)
 - Part E - Contains enzymes for the digestion of grain feed ✓ (1)
- 2.2 Energy flow in an animal**
- 2.2.1 Completion of representation**
- A - ME/metabolic energy ✓ (1)
 - B - Faeces/manure ✓ (1)
 - C - Body heat/heat production ✓ (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**
- $DE = GE/\text{gross energy} - \text{energy lost in faeces/manure}$ ✓
 - $DE = \text{Coefficient of digestibility} \times GE$ ✓ (Any 1) (1)
- 2.2.4 TWO reasons for the importance of net energy**
- Needed for production/reproduction/growth/work/draught ✓
 - Maintenance ✓ (2)

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

- (a) • Fishmeal ✓

Reason

The highest BV/BV of 90/essential amino acids needed for growth ✓

OR

- Lucerne ✓

Reason

It has a BV of 75/essential amino acids needed for growth ✓

(2)

- (b) • Maize ✓

ReasonIt has the highest energy value/high carbohydrate content/
energy value of 80 ✓

(2)

- (c) • Barley ✓

ReasonNeed feed with a low BV/BV of 50/energy value of 60% for
maintenance ✓

(2)

2.3.2 Reason for high BV in lucerne over barley

- Lucerne is a legume crop rich in proteins/
-
- essential amino acids ✓✓

OR

- Barley is a non-legume poor in proteins/rich in carbohydrates ✓✓

(2)

2.4 Fodder flow programme**2.4.1 Total feed required for the year****Requirement for the dry season**

Requirement/animal/day x number of animals x 30days x 6months

- 15kg x 30 animals x 30days x 6months ✓
-
- = 81 000kg ✓

Requirement for the whole year

= Rainy season required + dry season required

- 108 000kg + 81 000kg = 189 000kg ✓

(3)

2.4.2 Total amount available for the dry season

- 0,15 x 1000 x 42 x 6 ✓
-
- = 37 800kg ✓

(2)

2.4.3 Feed flow problem for the farmer during the dry seasonNeed of feed exceeds the available resources/shortage as 37 800
kg available compared to 81 000 kg need for the animals/
shortage ✓✓

(2)

2.4.4 Sustainable measure to correct the shortage

- Cutting/bailing/making hay during rainy season ✓
-
- Storage of fodder for dry season ✓
-
- Correct stocking rate/culling/stock reduction ✓

(Any 1) (1)

2.5 **Balanced ration**

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

- Maize meal = $\frac{61,29 \times 600\text{kg}}{100}$ ✓
= 367,74kg ✓
- Sunflower oilcake = $\frac{38,71 \times 600\text{kg}}{100}$ ✓
= 232,26kg ✓

OR

12 + 19 = 31

- Maize meal
 $\frac{19}{31} \times 600$ ✓
= 367,74kg ✓
- Sunflower oilcake
 $\frac{12}{31} \times 600$ ✓
= 232,26kg

(4)

2.5.2 **Feed constituting 19 parts**

Maize meal ✓

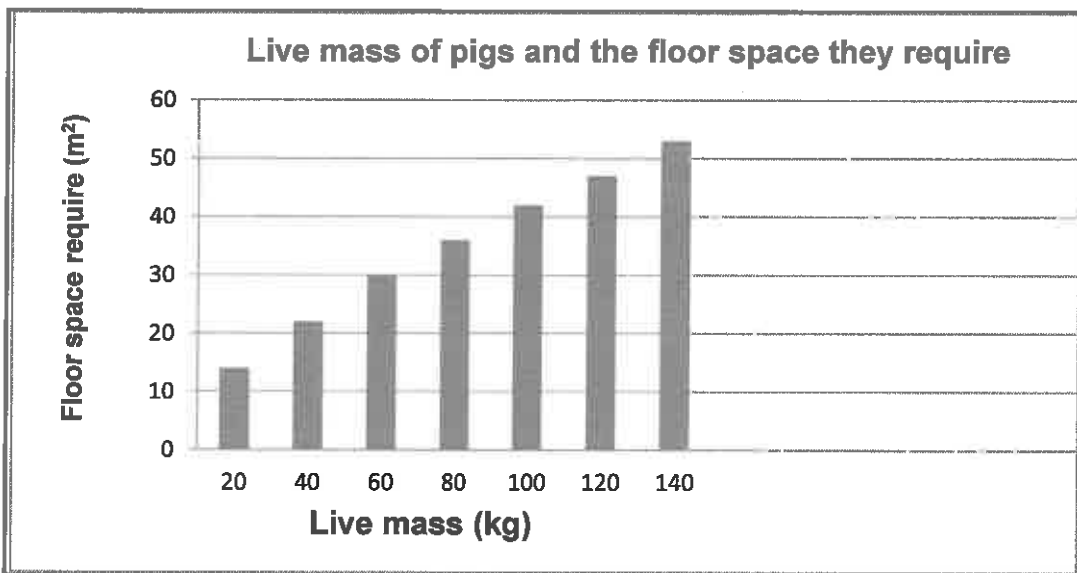
(1)

[35]

QUESTION3: ANIMALPRODUCTION, 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**
An increase in live mass ✓ leads to an increase in floor space required ✓ (2)

3.2 **Apparatus used for procedures in animal production system**

3.2.1 **Identification of the apparatus**
Elastrator/castrator/rubber ring pliers ✓ (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/easier mating ✓ (Any 1)

Castration

- For better breeding management ✓
- Improved meat quality ✓
- Taming the animal/calmer ✓
- Inferior male animals are castrated ✓ (Any 1) (2)

3.3 **Loading and transportation of farm animals**

3.3.1 **Facility to direct animal**
Crush ✓ (1)

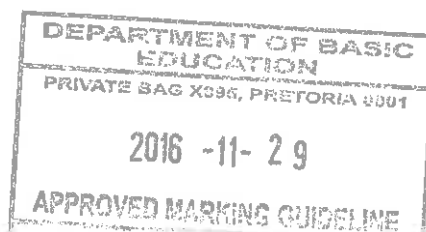
3.3.2 **TWO measures to design a crush**

- Should have high/strong/solid sides ✓
- Should have single/narrow curves that are not sharp ✓
- Nothing that should harm/hurt/cause injury to animals ✓
- The size of the animal ✓ (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 ✓
- Avoid overcrowding/overloading/adequate space ✓
- Ventilation/protection during hot/cold/rainy weather ✓
- Do not load animals too long before transport ✓
- Handle with care/calm ✓
- Pregnant animals should not be transported ✓ (Any 2) (2)



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3.4 Life cycle of a blowfly

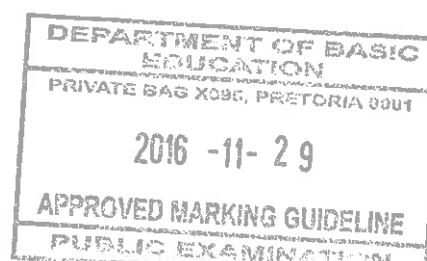
- 3.4.1 **Name of the parasite**
Blowfly ✓ (1)
- 3.4.2 **Harmful stage in the life cycle**
Larva/maggot stage ✓ (1)
- 3.4.3 **Condition caused by larval stage**
Blowfly strike/attacks/myiasis ✓ (1)
- 3.4.4 **Term used for removal of wool**
Crutching/crouching ✓ (1)
- 3.4.5 **THREE non-chemical management practices to control parasite infestation**
- Correct timing of shearing and crouching ✓
 - Clipping wool and cleaning of wounds/remove maggots ✓
 - Tail docking ✓
 - Rotational grazing ✓
 - Breeding and selection of resistant breeds ✓
 - Avoid wet areas ✓
 - Hygienic conditions/removal of dung ✓
 - Lambing time after shearing ✓
- (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/infectious ✓
 - Both are enzootic ✓
 - Both are resistant ✓
 - Both are viral diseases ✓
- (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 ✓
 - Vaccination ✓
- (Any 2) (2)



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3.6.4 **TWO economic implications of diseases**

- Export bans affect economy ✓
- Job loss ✓
- Financial loss/millions of rands lost ✓
- 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**

- 6/1 million ✓

(1)

4.1.2 **Correlation
Dairy cattle**

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

Sheep

- Sheep produce less semen ✓ that is highly concentrated ✓

OR

- Bulls produce more ✓ semen than sheep ✓

(2)

- Sheep produce a larger concentration ✓ than bulls ✓

(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/infections ✓
- Sperm abnormalities/defects/viability ✓
- Semen concentration ✓

(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)

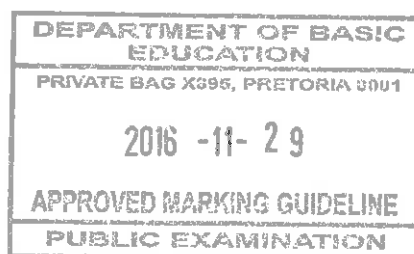
(d) Cloning ✓

(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/conception ✓
 - To increase the chances of fertilisation/conception ✓ (3)
- 4.4 Multiple births**
- 4.4.1 Types of twins in representation A and B**
- A - Dizygotic/non-identical/fraternal twins ✓
 - B - Monozygotic/identical twins ✓ (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/mitosis of the same zygote ✓ (1)
- 4.4.4 Reason for the gender of the twins in representation A**
Fertilisation by different sperm cells/
fertilisation of two separate ova ✓ (1)
- 4.4.5 THREE factors for multiple births**
- Fertility/genetics ✓
 - Environmental factors ✓
 - Breed type ✓
 - Nutrition ✓
 - Super ovulation ✓
 - Type of animal ✓ (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**
- Correcting the position ✓
 - Veterinary service/Caesarean-section if position cannot be corrected ✓ (2)

4.6 Milk ejection**4.6.1 TWO stimuli by the milker**

- Washing of udder ✓
- Massage of the udder ✓
- Appearance/sound/behaviour of the milker ✓
- Milking action ✓
- Presence of the calf ✓

(Any 2) (2)

4.6.2 Hormone for milk ejection

Oxytocin ✓

(1)

4.6.3 Hormone inhibiting milk ejection

Adrenalin ✓

(1)

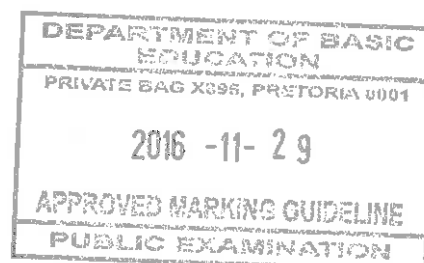
4.6.4 Bacterial disease affecting the udder

Mastitis ✓

(1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150



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TOLERANCE RANGES NSC SUBJECTS 2016

DATE 26-27 NOVEMBER 2016

SUBJECT	AGRICULTURAL SCIENCES										PAPER 1			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	
QUESTION NUMBER	45	35	35	35										
QUESTION TOTAL														
FINAL TOLERANCE	0	1	2	2										
RANGE PER QUESTION		2.3.2 (2)	3.3.4 (1)	4.3.3 (1)										
			3.4.5 (1)											
FINAL TOLERANCE RANGE FOR QUESTION PAPER	5 Marks 3.3%										TOTAL MARKS			150

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DATE 27/11/2016

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