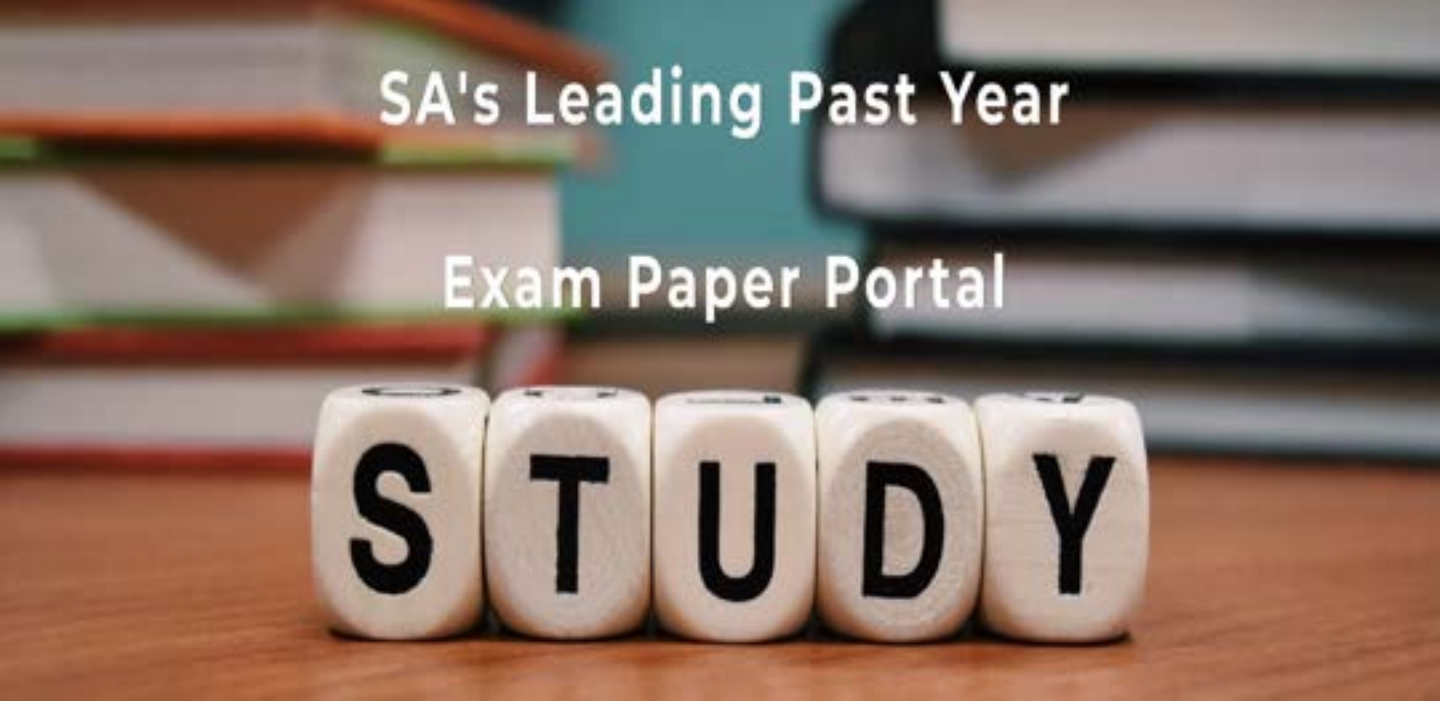

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GRADE 12

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	Enucleating ✓✓		
	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 = gross energy – energy lost in faeces ✓ (1)

2.2.4 TWO reasons for the importance of net energy
- Needed for production ✓
- Needed for maintenance ✓ (2)

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 is 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)

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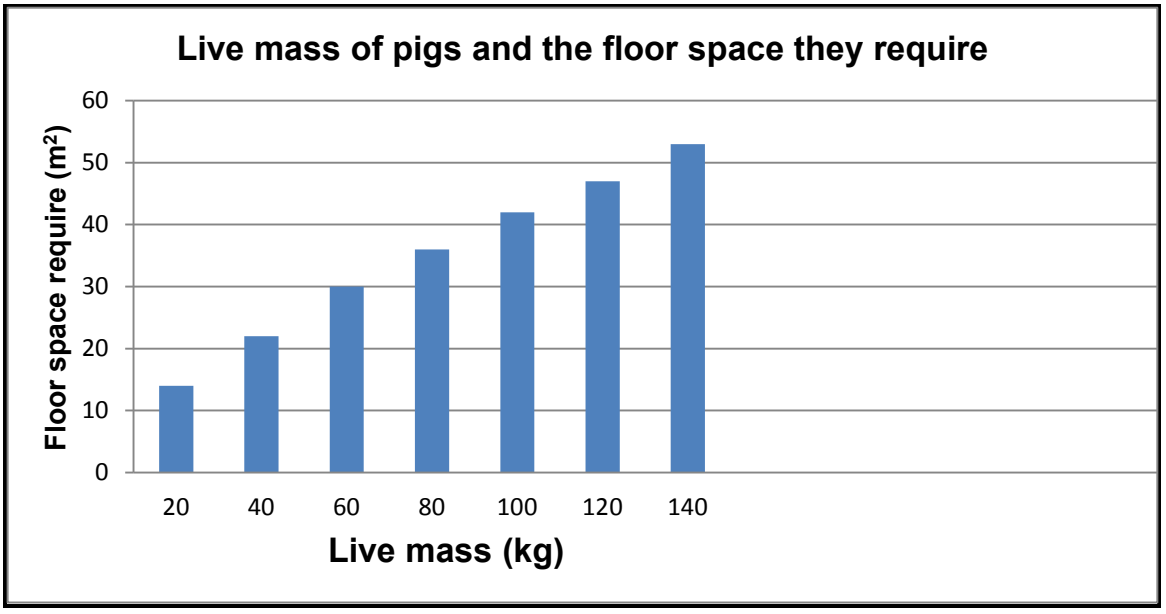
QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Floor space required by pigs**

3.1.1 **Bar graph**



Criteria/rubric/marking 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 (m^2/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)

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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**
- 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**
- 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**
- 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)
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TOTAL SECTION B: 105
GRAND TOTAL: 150