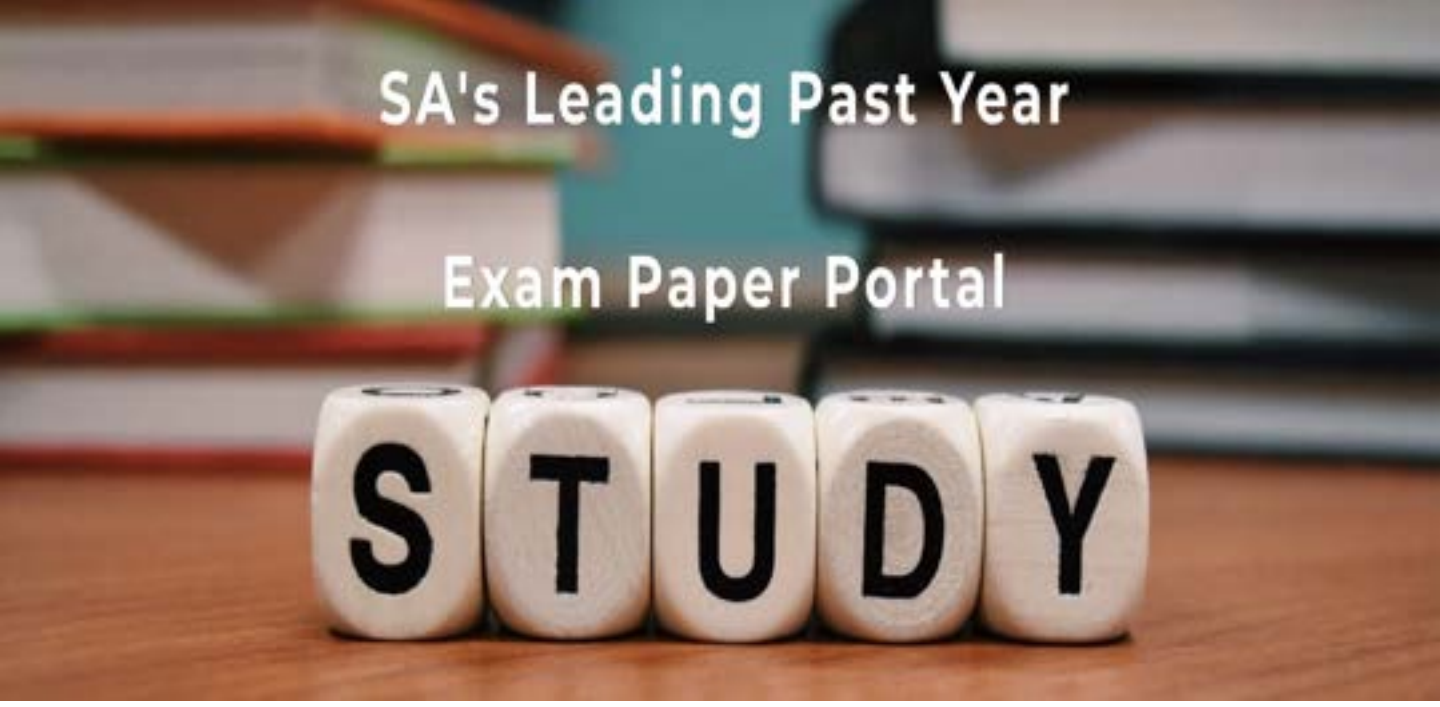

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GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2013

MEMORANDUM

MARKS: 150

This memorandum consists of 10 pages.

SECTION A

QUESTION 1

1.1	1.1.1	D ✓✓		
	1.1.2	B ✓✓		
	1.1.3	D ✓✓		
	1.1.4	C ✓✓		
	1.1.5	C ✓✓		
	1.1.6	A ✓✓		
	1.1.7	A ✓✓		
	1.1.8	B ✓✓		
	1.1.9	C ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	B only ✓✓		
	1.2.2	B only ✓✓		
	1.2.3	A only ✓✓		
	1.2.4	None ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Small intestine/jejunum/ileum/duodenum ✓✓		
	1.3.2	Carbohydrates/fats/lipids/oils ✓✓		
	1.3.3	Lobola ✓✓		
	1.3.4	Ovulation ✓✓		
	1.3.5	Quarantine ✓✓	(5 x 2)	(10)
1.4	1.4.1	Amino acids/peptides ✓		
	1.4.2	Endothermic/homoeothermic/warm blooded ✓		
	1.4.3	Indigenous ✓		
	1.4.4	Feedlot ✓		
	1.4.5	Blowflies ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 Digestive system of a farm animal

2.1.1 Labelled parts

(a) D ✓ (1)
(b) G ✓ (1)
(c) C ✓ (1)

2.1.2 THREE adaptations of part C for absorption.

- It is a long thin tube that allows more nutrients to have contact with the walls and makes absorption easier ✓
- It has numerous folds hence a large surface area and makes more absorption possible ✓
- It has finger-like projections that enlarge the surface area for absorption ✓
- Villi with blood vessels/micro villi allow for easier absorption of nutrients into the bloodstream ✓
- Slow movement of food/muscle movement allows for more contact time with nutrients that will be absorbed ✓
- The presence of a single layer of columnar epithelial cells makes it easier for rapid absorption of nutrients ✓ (Any 3) (3)

2.1.3 Absorption of fat molecules

- The fat molecules are broken up into fatty acids and glycerol**/** enzyme lipase breaks up fat molecules into simpler and soluble substances✓
- Short chain fatty acids/ simpler soluble substances are directly absorbed ✓
- Passive absorption into the blood capillaries through diffusion✓
- Fatty acids and glycerol are absorbed into the lacteal / lymph vessel ✓
- Long chain fatty acids are actively absorbed through carrier molecules ✓ (Any 2) (2)

2.2 Digestibility of feed

2.2.1 Digestibility co-efficient

$$DC = \frac{\text{DM intake (kg) – DM of manure (kg) x 100}}{\text{DM intake(kg)}} \checkmark$$

$$= \frac{8.8\text{ kg} - 2.7\text{ kg} \times 100}{8.8\text{ kg}} \checkmark \checkmark$$

Or

$$= \frac{6.1 \times 100}{8.8\text{ kg}} \checkmark \checkmark$$

Or

One mark for evidence of substitution of values into the formula✓
One mark for evidence of simplification of values✓

And

= 69,32 **Or** 69 ✓ % ✓ (5)

2.2.2 Implication of the value obtained in QUESTION 2.2.1

- 69,32 or 69% of the feed ✓
- was digested and absorbed ✓ **Or**
- 30,68 or 31% of the feed ✓
- was not digested and absorbed but excreted ✓ (Any 2) (2)

2.3 Balancing rations

2.3.1 **Feed A (Maize):** 9 **20** ✓

18 ✓

Feed B: (OCM)
(Oil cake meal) 38 **9** ✓

Mix 20 parts of Feed A (Maize) with 9 parts of Feed B (OCM) **Or** 20:9 ✓ (4)

2.3.2 Percentage of maize

20 + 9 = 29 ✓

$$= \frac{20 \times 100}{29} \checkmark$$

= 68,97 **Or** 69% ✓ (3)

2.4 **Nutrient deficiencies**

2.4.1 Phosphorus/P ✓ (1)

2.4.2 Iron/Fe ✓ (1)

2.4.3 Iodine/I ✓ (1)

2.5 **Comparing feeds**

2.5.1 **Nutritive ratio**
Feed A:

TDN = 8 + 50 + 22 = 80% ✓ **Or** DNNE =50 +22 = 72%✓

NR = 1: $\frac{\text{TDN-DP}}{\text{DP}}$ ✓ **Or** 1:$\frac{\text{DNNE's}}{\text{DP}}$ ✓

NR = 1: $\frac{80 - 8}{8}$ ✓ **Or** 1:$\frac{72}{8}$ ✓

NR = 1: 9 ✓ (4)

2.5.2 **Feed for fattening animals with reason**
- Feed A ✓ (1)

Reason
- NR is wide/(1:9) ✓
- Higher ratio of carbohydrates to protein ✓
- As carbohydrates are necessary for fattening ✓ (Any 2) (2)

2.5.3 **Feed suited for young growing animals**
- Feed B ✓ (1)

Reason
- NR is narrow/(1:5) ✓
- Higher ratio protein to carbohydrates ✓
- As protein is necessary for growth ✓ (Any 2) (2)

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QUESTION 3: ANIMAL PRODUCTION

3.1 **Animal behaviour**

3.1.1 **E** ✓ (1)

3.1.2
- **D** ✓
- **C** ✓ (Any 1) (1)

3.1.3
- **B** ✓
- **E** ✓ (Any 1) (1)

3.1.4 • **A** ✓ (1)

3.1.5 • **B** ✓ (1)

3.2 **Temperature requirements**

3.2.1 **Heat production**

- Dairy cows/cattle. ✓ (1)

Reason

- It has a value of 2500 kJ/h which is more than the others. ✓
- Millions/many micro-organisms in the stomach that produce heat through fermentation.✓ (Any 1) (1)

3.2.2 **Reasons for intensive chicken production**

- Heat production is the lowest ✓
- Optimal temperature is the highest ✓
- Lower critical temperature is the highest ✓
- Close range between critical and optimal temperature ✓
- Air movement to prevent respirational problems ✓
- Temperature control to prevent diseases ✓ (Any 2) (2)

3.2.3 **Definition of optimal temperature**

- Ideal/best/most comfortable/most suitable /most favourable environmental temperature✓
- The animal does not need to use its own energy to control body temperature**/**allows for the most cost effective production output/and conducive for production ✓ (2)

3.2.4 **Reason for keeping pigs in an enclosed environment in winter**

- Have a higher lower critical temperature compared to cows ✓
- And will need a warmer environment to survive/to produce ✓
- As they have a lower ability to produce heat ✓ (Any 2) (2)

3.3 Adaptation of Mbuzi goat to harsh conditions

3.3.1 (a) Environmental conditions

- Pigmentation of the skin✓
- protects it from radiation ✓

or

- Legs adapted✓
- to steeper slopes/to reach nutritious vegetation ✓

or

- Horns✓
- to protect from predators ✓

or

- Good motherly instincts✓
- supply it's young with regular nutrition (sucking of milk)✓ (2)

(b) **Pest and diseases**

- Nutritious shrubs and bushes ✓
- makes it strong and more resistant to infections ✓

or

- Not susceptible to worm/internal parasites✓
- due to adaptability to local condition ✓

or

- Indigenous breed which has been exposed to local conditions including pests and diseases✓
- That is naturally selected to be resistant ✓ (2)

3.3.2 Management practices

- Dipping/pest control ✓
- Injection/Vaccination ✓
- Counting ✓
- Dosing/Deworming ✓
- Weaning/Kidding ✓
- Tagging/marking/identification ✓
- Castration ✓
- Weighting ✓
- Age determination ✓
- Artificial Insemination/AI ✓
- Hoof trimming✓ (Any 3) (3)

3.4 Feed utilisation and conversion

3.4.1 Calculation of feed for Animal A and B

Quantity of feed for **Animal A**: 48 kg – 6 kg= 42 kg✓
Quantity of feed for **Animal B**: 56 kg – 6kg = 50kg ✓ (2)

3.4.2 **Animal that used the ration more effectively**

- Animal B ✓ (1)

Reason

- Higher production in proportion to feed ingested ✓
- Animal A : 42kg of feed to produce 12 litres of milk/3.5kg per litre
  Animal B : 50kg of feed to produce 43 litres of milk/ 1,2kg per litre ✓
- Better conversion rate ✓
- Better genetic material ✓ (Any 2) (2)

3.5 **Broiler production unit**

3.5.1 **Equipment to be used (each equipment should be used once)**

(a) Insulation material on the roof/foldable walls ✓ (1)
(b) Electric heaters/foldable walls ✓ (1)
(c) Fans on the roof and walls/ foldable walls ✓ (1)
(d) Foot bath at all entrances ✓ (1)

3.5.2 **Characteristics of an intensive animal production**

- It is highly hygienic ✓
- Protection against extreme environmental conditions/shelter is provided ✓
- Regulation of optimal temperature for production ✓
- Fixed/regular supply of feed and water ✓
- Kept at high density/lots of animals in a small space ✓
- Capital intensive/expensive with high tech equipment/mechanized ✓

(Any 4) (4)

3.5.3 **Possible health risks**

- Disease ✓
- The outbreak of an infectious disease may be transmitted quickly amongst poultry ✓ (2)

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QUE/STION 4: ANIMAL REPRODUCTION, PROTECTION AND CONTROL

4.1 **Pregnancy testing**

4.1.1 **Labelled parts**

A - Caruncles/uterus wall/placenta ✓
B - Uterus/womb ✓
C – Cervix ✓ (3)

4.1.2 **TWO advantages of early pregnancy testing**

- For proper feeding ✓
- For proper management of diseases and parasites ✓
- For proper management of breeding cycles/records/calving date ✓

(Any 2) (2)

4.1.3 **Role of the mucus plug**

- Protects animal ✓
- Against external diseases and infections ✓ (2)

4.1.4 **Conditions that could occur**

(a) Maceration✓ (1)
(b) Mummification✓ (1)

4.1.5 **Condition and TWO possible causes for the termination of pregnancy**

- Abortion/miscarriage ✓ (1)

Reason

- Diseases ✓
- Injuries/maltreatment ✓
- Infection ✓
- Laxatives/wrong medication ✓
- Toxins/poisons ✓
- Fever reaction ✓
- Malnutrition ✓
- Stress ✓
- Hormonal imbalances ✓ (Any 2) (2)

4.2 **Structures in reproduction**

4.2.1 **Names represented by letters**

A - Ovary ✓
B - Graafian follicle✓
E - Infundibulum✓ (3)

4.2.2 **Hormones**

(a) Follicle stimulating hormone/FSH ✓ (1)
(b) Oestrogen/LH (Luteinising hormone) ✓ (1)
(c) Oestrogen ✓ (1)
(d) Progesterone ✓ (1)

4.2.3 **Adaptability of infundibulum**

- Contains hair-like structures/cilia ✓
- for movement of the ova ✓

Or

- Wider at the edge/bell shaped/ funnel shape ✓
- adapted for holding/capturing the ova ✓ (2)

4.3 **Indigenous methods of controlling diseases**

4.3.1 Herbs/concoctions/mixtures ✓ (1)

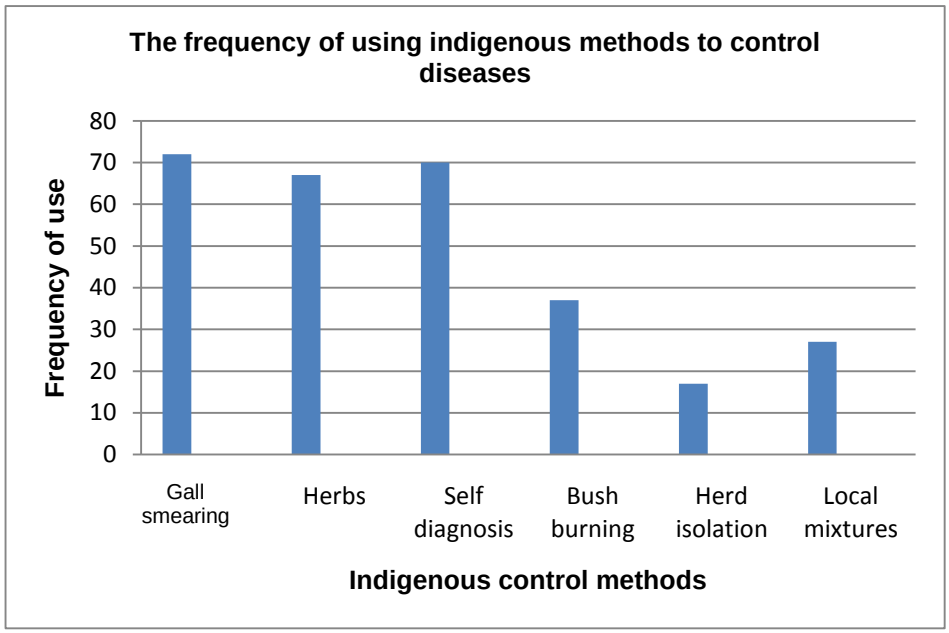
4.3.2 **TWO most common methods**

- Gall smearing ✓
- Self diagnosis ✓ (2)

4.3.3 **Ways in which bush burning control the ticks**

- Destroy eggs/larva/nymph ✓
- Kills adult ticks ✓
- Host in the life cycle for 2 and 3 host ticks is killed ✓ (2)

4.3.4 **Bar graph on indigenous control methods**



Marking graph with the following checklist:

Criteria	Yes: 1 Mark	No: 0 Mark
1. Bar graph	1 ✓	
2. X axis labelled	1 ✓	
3. Y axis labelled	1 ✓	
4. Points are plotted correctly	1 ✓	
5. Correct heading	1 ✓	
6. Correct subheadings for X- axis	1 ✓	

(6)

4.3.5 **THREE measures to restrict infectious diseases**

- Vaccination/inoculation ✓
- Injections ✓
- Bio-security/sanitation/proper handling of manure ✓
- Sufficient space/ good ventilation ✓
- Isolation/quarantine/separation ✓
- Controlling pests and parasites / dipping/ dosing✓
- Good nutrition and supplements ✓
- Breeding of resistant animals ✓

(Any 3) (3)

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TOTAL SECTION B: 105
GRAND TOTAL: 150