



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2016

AGRICULTURAL SCIENCES: PAPER I

MARKING GUIDELINES

Time: 2½ hours

150 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A

QUESTION 1

1.1	1.1.1	A	B	C	D
	1.1.2	A	B	C	D
	1.1.3	A	B	C	D
	1.1.4	A	B	C	D
	1.1.5	A	B	C	D
	1.1.6	A	B	C	D
	1.1.7	A	B	C	D
	1.1.8	A	B	C	D
	1.1.9	A	B	C	D
	1.1.10	A	B	C	D

(20)

1.2		A only	B only	A and B	None
	1.2.1	A	B	C	D
	1.2.2	A	B	C	D
	1.2.3	A	B	C	D
	1.2.4	A	B	C	D
	1.2.5	A	B	C	D

(10)

1.3	1.3.1	Progesterone
	1.3.2	Vitamin D
	1.3.3	Intensive production
	1.3.4	Biological value
	1.3.5	Caecum

(10)

1.4	1.4.1	Embryo transfer/Embryo transplant
	1.4.2	curved
	1.4.3	Net/Maintenance
	1.4.4	symbiotic/mutualism/mutualistic
	1.4.5	mammary/udder

(5)

45 marks

SECTION B

QUESTION 2 ANIMAL NUTRITION

2.1 Feeds table

2.1.1 Blood meal
Fish meal (2)

2.1.2 No chewing of cud/no regurgitation.
No rumen or large opening in the stomach that could serve as a fermentation vessel.
No symbiotic rumen microbes to digest cellulose.
(Any 2) (2)

2.1.3 Blood/fish meal/milk powder
Concentrates have low crude-fibre content/are highly digestible/no plant matter (cellulose). (2)

2.1.4 Sorghum grain is a source of energy/an energy concentrate, because it is rich in carbohydrates like starch. (2)

2.1.5 Blood meal
Because it has the highest crude protein of 82,2%. (2)

2.1.6 Pearson square calculation.
Lucerne hay
DP 14,1%
Maize meal
DP 8,9%

$14\% - 8,9\% = 5,1$ parts lucerne hay
 $14,1\% - 14\% = 0,1$ parts maize meal

5,1 lucerne hay : 0,1 maize meal

or

Mix 5,1 parts of lucerne hay with 0,1 parts of maize meal. (5)

2.2 Chicken digestive tract

- 2.2.1
1. Oesophagus
 2. Crop
 3. Proventriculus
 4. Gizzard
 5. Duodenal loop or duodenum
 6. Small intestine
 7. Caecum
 8. Large intestine
 9. Cloaca (9)

2.2.2 Pancreas and its function

- (a) Pancreas (1)
- (b) Secretes digestive enzymes/pancreatic juices. (1)

2.3 MAXIWOL**2.3.1 Reason for lower intake during late pregnancy**

Feed is high in protein, which is required during growth, lactation and flushing, while only required in small amounts during late pregnancy to prevent large lambs/lambing difficulties. (3)

2.3.2 Matching lick to grazing system

- (a) **Mixed Karoo veld**
Lick 2. Karoo shrubs substitute protein slightly hence lick with middle of the road protein/urea levels required. (2)
- (b) **Green pastures**
Lick 1. Green growing grass does not require as high a level of protein supplementation. (2)
- (c) **Dry veld or dry crop residues**
Lick 3. The drier the grass the higher the urea level in the diet must be to enable gut microbes to deal with higher fibre levels. (2)

[35]**QUESTION 3 ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Production systems**

- 3.1.1 A Intensive
B Extensive (2)

3.1.2 Characteristics of extensive systems

Large area
Low stocking rate
Low capital inputs
Relatively low levels of production
(Any 3 of these) (3)

3.1.3 Influence of drought on production

Extensive production/B
Poor production of veld and low water levels (3)

3.1.4 Strategies for coping with drought

- Check watering system for leaks.
- Increase selection and reduce stock numbers.
- Sell off any excess animals.
- Try and reduce irrigation where possible.
- Use strip grazing to reduce wastage of grass.
- Provide shade for animals to reduce water intake.

(Any 4 of these or other valid points made)

(4)

3.1.5 Healthy behaviour

- Grazing.
- Staying with the herd.
- Chewing the cud.
- No signs of agitation.
- No dung stains under the tail.
- Animal walking without a limp.

(Any 3)

(3)

3.1.6 Laying hen protection

- All in all out system.
- Foot bath at each house.
- Staff should shower in and out.
- Wash hands in the house.
- Vaccinate all the birds/vaccination.
- Build houses.
- Control rodents and wild birds.
- Proper waste sanitation.
- Ventilation.

(Any 5)

(5)

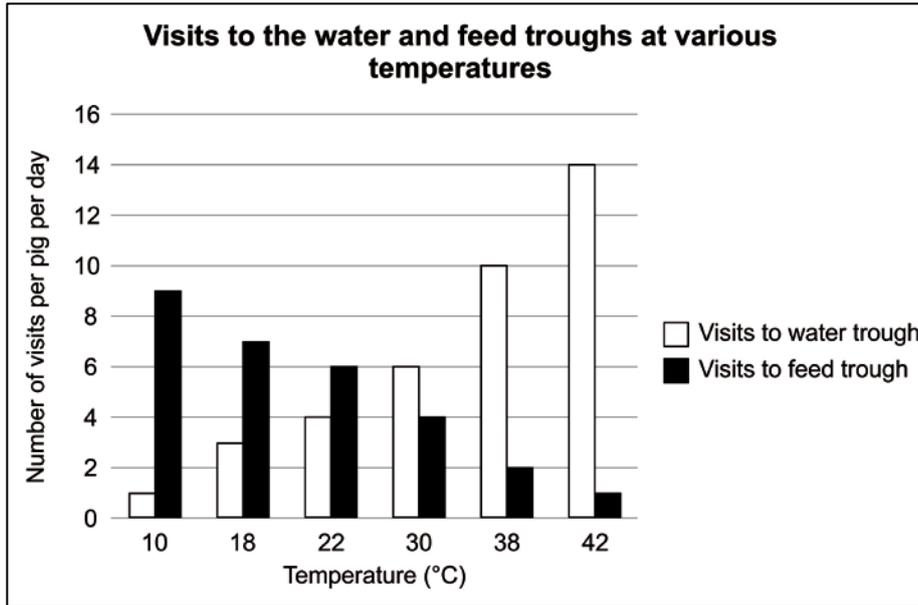
3.1.7 Vaccination, dipping and dosing

- Vaccination – injection used to prevent disease.
- Dipping – application of a chemical or remedy to remove external parasites.
- Dosing – oral ingestion of a chemical or drug to control internal parasite.

(3)

3.2 **Piggery feeding and watering**

3.2.1 **Bar graph question**



Bar graph checklist

Evidence	Yes	No
Heading	1	0
x-axis labelled correctly	1	0
y-axis labelled correctly	1	0
Correct values	1	0
Bar graph: Visits to water trough	1	0
Bar graph: Visits to feed trough	1	0

(6)

3.2.2 **Ideal temperature**

Between 18° and 22 °C

- Any colder and feed wasted on keeping warm.
- Any hotter and not enough feed is consumed for growth.

(3)

3.2.3 **Prevention of random mating**

- Keep boars separate from sows and gilts.
- Ensure the pen gates are well secured.
- Train the staff.
- Castration of growing pigs.

(3)

[35]

QUESTION 4 ANIMAL REPRODUCTION**4.1 Artificial insemination****4.1.1 AI rather than a bull**

- AI sires are thoroughly screened and tested.
- Faster genetic progress.
- Genetics available from all over the world.
- Very few dairy stud breeders to buy bulls from.
- Bull can be dangerous.
- Easier to control breed with AI.
- Bull may get injured.
- Prevent cows being injured during natural mating.
- Reduce disease spread.

(Any 5)

(5)

4.1.2 Factors to control when handling semen

- Exposure to light.
- Exposure to water.
- Exposure to high temperatures.

(3)

4.1.3 Signs of oestrus in cattle

- Isolation.
- Bellowing at the fence.
- Bullying or fighting with other cows.
- Mounting other animals.
- Gazing over the fence as if looking for a lost calf.
- Scuffed tail head from being ridden by other cows.
- Dirty flanks from being mounted by other animals.
- Bull string or mucous secretion from the vulva.
- Sniffing other cows.
- Taking more interest in bulls.

(Any 4)

(4)

4.1.4 Chase cow post AI

No. Leads to an increase in her body temperature and will decrease the chances of conception.

(3)

4.2 Spermatogenesis**4.2.1 Description of spermatogenesis**

The primary male sex cells develop in the tubules of the testis and form spermatozoa.

(4)

4.2.2 Role of meiosis

The halving of the number of chromosomes in the reproductive cells.
To transport the genetic information to the reproductive cells.

(2)

4.2.3 Congenital defects

- Hypoplasia
- Cryptorchidism
- Sperm defects

(Any 2)

(2)

4.3 Female reproductive tract**4.3.1 Parts of the female reproductive tract**

- A. Ovary
- B. Graafian follicle
- D. Ovum /egg cell
- E. Infundibulum
- F. Corpus luteum

(5)

4.3.2 Process occurring at C

Ovulation

(1)

4.3.3 Hormones

- (a) Follicle stimulating hormone.
- (b) Oestrogen/Luteinising hormone.
- (c) Oestrogen.
- (d) Progesterone.

(1)

(1)

(1)

(1)

4.3.4 Adaptability of the infundibulum

- Contains hair-like structures/cilia for movement of the ova.
or
- Wider at the edge/bell shaped/funnel shaped adapted for holding/
capturing the ova.

(2)

[35]**105 marks****Total: 150 marks**