



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2013

**AGRICULTURAL SCIENCES P1
MEMORANDUM**

MARKS: 150

This memorandum consists of 9 pages.

ANSWER SHEET: AGRICULTURAL SCIENCES P1

SECTION A

QUESTION 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

(10 x 2) (20)

QUESTION 1.3

1.3.1	Fallopian tube/Ampulla ✓✓
1.3.2	Commercial farming ✓✓
1.3.3	Quarantine service/ Quarantine ✓✓
1.3.4	Vitamin K ✓✓
1.3.5	Mastitis ✓✓

(5 x 2) (10)

QUESTION 1.2

	ONLY A	ONLY B	BOTH 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

(5 x 2) (10)

QUESTION 1.4

1.4.1	Non-contagious ✓
1.4.2	Freemartin/Queen ✓
1.4.3	Cobalt ✓
1.4.4	Protein ✓
1.4.5	5 °C ✓

(5 x 1) (5)

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SECTION B**QUESTION 2: ANIMAL NUTRITION**

- 2.1 2.1.1 Pig ✓ (1)
- 2.1.2 The animal has one simple stomach. ✓✓
The animal is monogastric. ✓✓
The animal has the part labelled B. ✓✓ (Any 1) (2)
- 2.1.3 A = Bile ✓
B = Gastric juice ✓
C = Succus Entericus/Intestinal juice ✓ (3)
- 2.1.4 The pH value is always in the alkaline medium. ✓ (1)
- 2.2 2.2.1 Peristalsis/Peristaltic movement ✓ (1)
- 2.2.2 This is the wave of contraction and the relaxation ✓ of the circular muscles of the oesophagus through which the bolus moves to the stomach. ✓ (2)
- 2.2.3 Retro-peristalsis/Vomiting ✓ (1)
- 2.3 2.3.1 Carcass meal ✓
It has the highest protein content which is 79,4%. ✓ (2)
- 2.3.2 Maize meal contains more carbohydrates ✓
which is a source of energy and easily digested ✓ (2)
- 2.3.3 Carcass meal ✓
Groundnuts oilcake meal ✓ (2)
- 2.3.4 Juicy/Succulent roughage ✓ (1)
- 2.3.5
 - Ruminants are able to chew the cud/Ruminating/able to swallow food and take it back again to the mouth cavity for regurgitating. ✓✓
 - Ruminants are able to break down cellulose through fermentation that takes place in rumen. ✓✓
 - There are certain bacteria or micro-organisms present in the reticulo-rumen that secrete the enzyme cellulase that digests cellulose. ✓✓ (Any 1) (2)

- 2.4 2.4.1 Moisture content of the hay = 20% of 30 kg = 6 kg ✓
 Moisture content of manure = 40% of 14 kg = 5,6 kg ✓

Digestibility coefficient

$$= \frac{\text{Dry material intake (kg)} - \text{Dry mass of manure (kg)}}{\text{Dry material intake (kg)}} \times \frac{100}{1} \checkmark$$

$$= \frac{(30 \text{ kg} - 6 \text{ kg}) - (14 \text{ kg} - 5,6 \text{ kg})}{30 \text{ kg} - 6 \text{ kg}} \times \frac{100}{1}$$

$$= \frac{15,6 \text{ kg}}{24 \text{ kg}} \times \frac{100}{1}$$

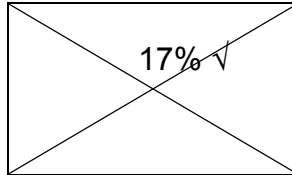
$$= 65\% \checkmark \quad \text{(Any 4)} \quad (4)$$

- 2.4.2 Small intestines ✓ (1)

- 2.5 2.5.1 **PEARSON SQUARE METHOD:**

FEED A = 24%

$$(31 - 17) = 14 \checkmark$$



FEED B = 31%

$$(24 - 17) = 7 \checkmark$$

The ratio for feed A and feed B is 14:7 or 2: 1 ✓ (4)

- 2.5.2 **FEED B PERCENTAGE:**

$$14 + 7 = 21 \checkmark$$

$$= \frac{7}{21} \times 100 \checkmark$$

$$= 33,3\% \checkmark \quad \text{(Any 2)} \quad (2)$$

- 2.6 2.6.1 **Biological value of feed:**

Proteins from animal origin possess more of the essential amino acids ✓ and can be used by animals to synthesise proteins for their own bodies or growth. ✓ (2)

- 2.6.2
- Repair worn out tissues ✓
 - Synthesis of amino acids ✓
 - Synthesis of hormones and enzymes ✓
 - Permits muscle contraction ✓
 - Proteins are antibodies therefore prevent the body from the foreign diseases ✓
 - Proteins act as cell membrane in most animals ✓

(Any 2) (2)

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QUESTION 3: ANIMAL PRODUCTION

- 3.1 3.1.1 **Farmer A** ✓
Because the farmer is using limited resources in the kraal/use of hands for milking. ✓ (2)
- 3.1.2
 - Nose plier ✓
 - Head gate/clamp ✓
 - Squeeze chute ✓
 - Whip ✓
 - Electric prodder ✓
 - Halter ✓
 - Strong rope ✓
 - Crush ✓ (Any relevant handling equipment) (Any 2) (2)
- 3.1.3 Production at the level that produces the largest income but is not necessarily the highest yield. ✓✓ (2)
- 3.1.4 Colostrum/Beestings ✓ (1)
- 3.1.5 Too cold and too hot temperatures reduce feed intake ✓ in animals which will disturb the metabolic rate resulting in lower body mass. ✓ (2)
- 3.2 3.2.1
 - Driver must carry a travelling permit for the load ✓
 - Red flag must appear at the back of the truck ✓
 - Age/sex must be considered ✓
 - Sick and pregnant animals must not be transported ✓
 - Avoid slippery vehicle load section ✓
 - Big well ventilated trucks must be used ✓
 - Animals must be fed well a day before the journey ✓ (Any 2) (2)

3.2.2 **Permit sample:**

Transportation permit for Livestock ✓			
Sold by: (Farmer/Owner) ✓			
Contact No: (Owner) ✓			
Type of Livestock: ✓			
Number bought: ✓			
Destination:	From: ✓	To:	
Signature: ✓		Date:	
Bought by: ✓			
Stamp ✓			

The permit should include the items above and any other relevant items.

(Any 4 of the contents above) (4)

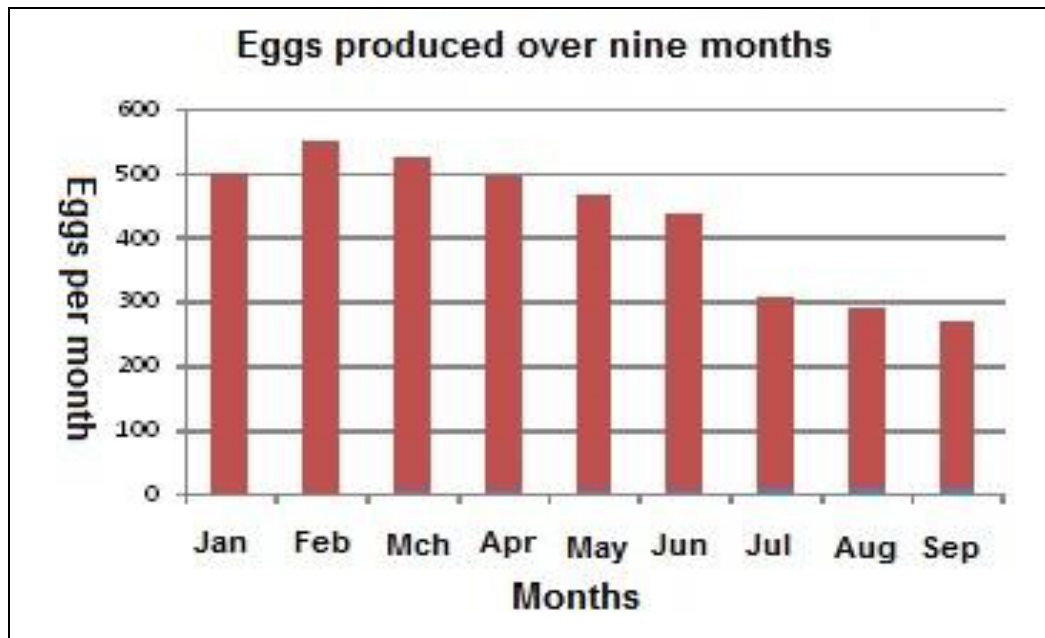
3.3 3.3.1 Cattle farming enterprise ✓ Picture A enterprise ✓
Exposed to the extreme climatic conditions as there is no shelter visible. ✓ (2)

3.3.2 Intensive farming. ✓
Pigs are kept in an enclosure or feedlots ✓./For careful breeding to convert feed more efficiently. ✓ (2)

3.3.3	INTENSIVE FARMING	EXTENSIVE FARMING
	Less energy used	More energy used ✓
	Animals are in enclosure	Out of enclosure/Animals are moving freely ✓
	Kept in feedlots	Search for food for themselves ✓
	High quality carcass	Low quality carcass ✓
	More production per unit	Low production per unit ✓
	Less exposed to diseases	More exposed to diseases ✓

(Any 2) (2)

3.4 3.4.1



Criteria to mark:

Bar graph	1	0
X axis labelled	1	0
Y axis labelled	1	0
Correct plotting/Accuracy	1	0
Correct heading	1	0
Units indicated on both axis/Scale	1	0

(Any 5) (5)

3.4.2

$$\begin{aligned}
 \text{Mean value} &= \frac{\text{Total number of eggs}}{\text{Number of months}} \checkmark \\
 &= \frac{500 + 550 + 520 + 490 + 460 + 430 + 300 + 280 + 260}{9} \checkmark \\
 &= \frac{3790}{9} \\
 &= 421,1 \checkmark
 \end{aligned}$$

(3)

- 3.5
 - Aggressiveness/tameness ✓
 - Type ✓
 - Breed ✓
 - Age ✓
 - Physiological state ✓
 - Health status ✓

(Any 2) (2)

3.6 3.6.1 Tattoo ✓ (1)

3.6.2 Castration ✓ (1)

3.6.3 Docking ✓ (1)

3.6.4 Dosing ✓ (1)

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QUESTION 4: ANIMAL REPRODUCTION, PROTECTION AND CONTROL

4.1 4.1.1 Diagram A = Spermatogenesis ✓
Diagram B = Oogenesis ✓ (2)

4.1.2 A = Male in testes ✓
B = Female in ovaries ✓ (2)

4.1.3	DIAGRAM A	DIAGRAM B
	Hypoplasia ✓	Anovulation ✓
	Sperm defects ✓	Freemartins ✓
	Cryptorchidism ✓	Double cervix canal ✓
		Anoestrus ✓

(Any 2) (2)

4.1.4 Meiosis ✓ (1)

4.1.5	Spermatogenesis	Oogenesis
	Continuous production although from puberty to old age the sperm cells are constantly being generated. ✓	Using up the oocytes generated before birth. ✓
	The production is subject to the extreme fluctuations regarding both quality and quantity. ✓	Continuous decrease of oocytes beginning with the foetal period. ✓
	Meiotic output four functioning, small, motile spermatozoa at the end of meiosis. ✓	Meiotic output one large, immotile oocytes and three shrivelled polar bodies are left at the end of meiosis. ✓

(Any 2) (2)

4.2	4.2.1	Ovum phase	Embryonic phase	Foetal phase
		Fertilised ova travel to the fallopian tube. ✓	Tissues, organs and systems begin to develop. ✓	Embryonic organs which have completed their differentiation, develop and grow. ✓
OR				
		Starts to divide by mitosis. ✓	A sac made of the three membranes i.e. amnion/chorion and allantoise developed around the embryo. ✓	The embryo has developed into a foetus. ✓
OR				
		The ball of the cell called blastula is attaching its self to the endometrium. ✓	Placenta also formed. ✓	The mother's body prepares itself for the feeding of the offspring. ✓

(Any 3) (3)

- 4.2.2
- She stops eating and walks around. ✓
 - Makes a bellowing noise. ✓
 - She urinates and defecates frequently. ✓
 - She isolates herself from the other cows. ✓
 - Ligaments of the tail, pelvis, vagina and the cervix relax. ✓
 - Vulva enlarges and become softer. ✓
 - Strings of mucus hang out of the vagina. ✓
 - The teats are painfully swollen and often leaks milk. ✓

(Any 3) (3)

- 4.2.3
- Identical twins:** refer to a situation when one sperm cell fertilise one egg cell into two halves which will look alike. ✓✓
- Fraternal twins:** refer to a situation when two different sperm cells fertilise two different egg cells at the same time leading to the offspring which will not look alike. ✓✓

(4)

- 4.3
- 4.3.1 **Spring** ✓
- Pre-starting of the summer season. Grass is green and accommodating good environment for the parasites ✓ to multiply themselves/wetness/rising temperature/rainfall. ✓

(3)

- 4.3.2
- Using medication/drenching/dosing/injection/lick block with worm remedies. ✓
 - Removing water around drinking troughs of animals/rotational grazing/avoid wet places. ✓
 - Using indigenous medication. ✓
 - Extermination of water snails with copper sulphate. ✓

(Any 2) (2)

- 4.3.3 Winter ✓ (1)

- 4.3.4
- Weakening animals ✓
 - Develop bloated bellies ✓
 - Animals grow badly and suffer from diarrhoea ✓
 - Serious loss of blood ✓

(Any 2) (2)

- 4.4 4.4.1 External parasites ✓
 - Damaging the skin ✓
 - Affect teats of the udder ✓
 - Live outside the animal's body ✓ (Any 1) (2)

- 4.4.2
 - Dipping in water with chemicals that can detach the ticks ✓
 - Spraying with strong chemicals that can cause the ticks to fall down ✓
 - Vaccination of animals so that the ticks' systems cannot tolerate it ✓
 - Biological control by the use of birds to control ticks ✓ (Any 1) (1)

- 4.4.3 Gall sickness/Red water ✓ (Any 1) (1)

- 4.5 4.5.1 A = Sheep sneezes and the larvae enter into the blood stream which will be circulated up to the lungs ✓
B = Cysts are eaten by the animal and developed into flukes ✓
C = Eggs from the snail developed into adult flukes ✓
F = Fluke eggs released through the faeces ✓ (4)

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TOTAL SECTION B: 105
GRAND TOTAL: 150