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# basic education

Department: Basic Education **REPUBLIC OF SOUTH AFRICA** 

# SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL SCIENCES P1

2018

# MARKING GUIDELINES

**MARKS: 150** 

These marking guidelines consist of 10 pages.

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#### 2 SC – Marking Guidelines

# **SECTION A**

# **QUESTION 1:**

# SECTION B

# **QUESTION 2: ANIMAL NUTRITION**

2.1	The alimentary canal of a farm animal						
	2.1.1	Identification of partsAVentriculus/gizzard/muscular stomach ✓DCloaca/vent ✓FCrop ✓	(1) (1) (1)				
	2.1.2	<ul> <li>Importance of part</li> <li>B Stores/releases bile ✓</li> <li>E Releases digestive juices/enzymes for digestion ✓</li> </ul>	(1) (1)				
	2.1.3	<ul> <li>Definition of chemical digestion</li> <li>Process where complex food particles are broken down to simpler substances ✓</li> <li>through the series of chemicals/enzymes/juices ✓</li> </ul>	(2)				
2.2	Process	es involved in the movement of food through the digestive tract					
	2.2.1	Identification of the processes labelledCAbsorption ✓DAssimilation ✓EExcretion/egestion/defaecation ✓	(1) (1) (1)				
	2.2.2	Indication of the letter of process (a) C ✓ (b) B ✓	(1) (1)				
	2.2.3	The enzyme responsible for the digestion of food in A Salivary amylase/ptyalin ✓	(1)				
2.3	Mixture of TWO feeds (Pearson Square)						
	2.3.1	Indication of the parts (a) Maize meal: 31 parts ✓ (b) Soya beans: 2 parts ✓	(1) (1)				
	2.3.2	<ul> <li>Justification of the answers</li> <li>(a) Lesser DP/DP of 11%/more of it is needed to give the required protein/carbohydrate rich ✓</li> <li>(b) Higher DP/DP of 44%/less of it is needed to give the required protein/protein rich ✓</li> </ul>	(1) (1)				
	2.3.3	Calculation of the quantity of maize meal (in kg) in a 285kg mix $31 \times 285 \checkmark = 267,72/268 \text{kg} \checkmark$ OR $31 \times 100 \checkmark = 93,94 \times 285 = 267,72/268 \text{kg} \checkmark$	(2)				

Fodder flow

2.4

2.5

2.6

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2.4.1	Calculation of the total feed supply (in ton) during the year 450 000 kg + 216 000 kg $\checkmark$ = 666 000 kg ÷ 1000 $\checkmark$ = 666 tons $\checkmark$	(3)
2.4.2	<ul> <li>TWO problems of the feed flow programme</li> <li>Deficit/shortage/too little feed during the dry months ✓</li> <li>Calving period coincide with the dry period ✓</li> <li>Supplementary feeding is too costly/R756 000 ✓ (Any 2)</li> </ul>	(2)
2.4.3	<ul> <li>ONE precautionary measure a farmer needs to take</li> <li>Make provision for the dry months from the excess feed during the rainy season/storage/making hay ✓</li> <li>Reduce the numbers of animals/culling/selling ✓</li> <li>Change calving to the rainy season ✓ (Any 1)</li> </ul>	(1)
Mineral/	vitamin responsible for deficiency symptoms	
2.5.1	Zinc/Zn ✓	(1)
2.5.2	Phosphorus/P 🗸	(1)
2.5.3	Vitamin K 🗸	(1)
2.5.4	Vitamin A/retinol ✓	(1)
Feed co	mponents of a ration	
2.6.1	Indication of the type of the animal Ruminant/cattle/sheep/goat ✓	(1)
2.6.2	<ul> <li>TWO reasons to support the answer</li> <li>Can consume feed high in crude fibre/roughage(Lucerne and oats hay) ✓</li> <li>Molasses is utilised to activate the rumen micro-organisms ✓</li> <li>Can utilize NPN/urea ✓ (Any 2)</li> </ul>	(2)
2.6.3	Identification of the concentrate in the ration Maize meal $\checkmark$	(1)
2.6.4	<ul> <li>TWO reasons of including molasses in this ration</li> <li>Improves the palatability/digestibility of roughages ✓</li> <li>Molasses is utilised to activate the rumen micro-organisms/provide energy ✓</li> <li>Binds the ration together/reduce dust/wastage of a ration ✓ (Any 2)</li> </ul>	(2)

# 3.1 **Production levels of a poultry farm on certain months of the year**

- 70	- •		February -	July		
60 Inits	■ Egg production		🗖 Broile	er production		
<b>5</b> 0						
30 S						
20						
10 10						
0	Feb	March	April	May	June	July
			Months o	f the year		

3.1.1 Bar graph on egg and broiler production from February to July

# Criteria/rubric/marking guidelines

	<ul> <li>Correct heading ✓</li> </ul>	
	<ul> <li>X-axis: Correctly calibrated with label (Months of the year) ✓</li> </ul>	
	<ul> <li>Y-axis: Correctly calibrated with label (Production levels) ✓</li> </ul>	
	<ul> <li>Correct unit ('000) ✓</li> </ul>	
	<ul> <li>Bar graph ✓</li> </ul>	
	<ul> <li>Accuracy ✓</li> </ul>	(6)
3.1.2	The trend in broiler production from February to August	
	<ul> <li>Production from February increases/more/better until ✓</li> </ul>	
	• June/July/August when production stabilised/constant $\checkmark$	(2)
Produ	iction systems	
3.2.1	Identification of production systems	
	A Extensive production system ✓	(1)
	B Intensive production/feedlotting system ✓	(1)
3.2.2	Comparison of the two systems on the basis of	
	(a) Capital investment	
	System A: Less capital investment 🗸	(1)
	System B: More capital investment ✓	(1)
	(b) Area of land in relation to production output	
	System A: More land occupied but relatively less	
	production 🗸	(1)
	System B: Less land but very high production $\checkmark$	(1)

3.2

3.3	Namii	ng of the structures		
	3.3.1	Battery cages/deep litter house ✓	(1)	
	3.3.2	Farrowing pen ✓	(1)	
	3.3.3	Holding pen ✓	(1)	
3.4	Vario	us stages of the life cycle of a parasite		
	3.4.1	Identification of the type of parasite External/ecto-parasite ✓	(1)	
	3.4.2	Classification of the type of parasite according to the life cycle Three-host parasite ✓	(1)	
	3.4.3	<ul> <li>Letters representing the stages in the life cycle of the parasite</li> <li>(a) B ✓</li> <li>(b) D ✓</li> <li>(c) E ✓</li> </ul>	(1) (1) (1)	
	3.4.4	<ul> <li>TWO detrimental effects this parasite has on livestock</li> <li>Damage the skin/teats/genitals ✓</li> <li>Lowering the resistance/decreased immunity of the host ✓</li> <li>Anaemia as a result of blood sucked from the host ✓</li> <li>Transmission of diseases ✓</li> <li>Death ✓</li> <li>General deterioration/reduced production/reproduction/ weight loss/retarded growth ✓</li> <li>Irritation ✓</li> <li>Paralysis ✓ (Any 2)</li> </ul>	(2)	
3.5.	Disea	ses in animals		
		<ul> <li>A Virus ✓</li> <li>B Anthrax ✓</li> <li>C Cattle/sheep/goat ✓</li> <li>D Heartwater ✓</li> <li>E Fungus/fungal ✓</li> </ul>	(1) (1) (1) (1) (1)	
3.6	Salt p	oisoning in livestock		
	3.6.1 Identification of the poisoning Salt poisoning ✓			
	3.6.2	TWO preventative measures		

- Enough/sufficient salt/not too much/avoid salt contaminated water √
- Supply enough/clean/fresh drinking water ✓ (2)

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	3.6.3	<ul> <li>ONE symptom of salt poisoning in farm animals</li> <li>Excessive salivation ✓</li> <li>Staggering/dragging the hind legs/wobbling/circling/blindness/ seizures/partially paralysed ✓</li> <li>Red/dry mucus membranes of the mouth ✓</li> <li>Increased urination/defecation ✓</li> <li>Increases thirst ✓</li> <li>Vomiting ✓</li> <li>Constipation ✓</li> <li>Hypersensitivity to touch ✓</li> <li>Aggressiveness ✓</li> <li>Abdominal pain/diarrhoea ✓</li> <li>Inflammation of the stomach and small intestine ✓ (Any 1)</li> </ul>	(1)
	3.6.4	<ul> <li>TWO possible measures to treat salt poisoning</li> <li>Remove the source/salt ✓</li> <li>Provide smaller quantities of clean/fresh drinking water at shorter intervals ✓</li> <li>Treat animals with isotonic saline solution/ hypertonic dextrose ✓ (Any 2)</li> </ul>	(2) <b>[35]</b>
QUEST	ION 4:	ANIMAL REPRODUCTION	[]
4.1	Repro	oductive system of a cow	
	4.1.1	A✓	(1)
	4.1.2	B√	(1)
	4.1.3	D✓	(1)
4.2	Horm	ones	
	4.2.1	<ul> <li>Naming parts</li> <li>A Mature Graafian follicle ✓</li> <li>C Ovum/egg/female reproductive cell/gamete ✓</li> </ul>	(1) (1)
	4.2.2	<ul> <li>Indication of hormone</li> <li>(a) Follicle stimulating hormone/FSH√</li> <li>(b) Progesterone √</li> </ul>	(1) (1)
	4.2.3	The function of infundibulum It captures(picks up) the ova/channel ova into the fallopian tube $\checkmark$	(1)
4.3	Embry	yo transplantation	
	4.3.1	Identification of the process Embryo transplantation/transfer/ET ✓	(1)

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# 4.3.2 **TWO advantages of ET to farmers**

- Fast/cost effective way to increase genetic improvement ✓
- Extend the reproductive life of older/unproductive cows ✓
- Offspring from superior animals are multiplied/higher calving percentage ✓
- Genetic material in the herd is conserved ✓
- Genetic material can be transported internationally  $\checkmark$
- Can improve the medical properties of products ✓
- Produce animals with improved resistance towards diseases ✓
- Prevent the extinction of valuable and endangered animals ✓
- Profits from increased sales of quality genes/products
- A planned breeding programme can be implemented  $\checkmark$  (Any 2) (2)

### 4.3.3 The term referring to the cow that is

(a) Donor cow ✓

(1)

(b) Recipient/surrogate cow ✓ (1)

# 4.4 Artificial Insemination (AI)

# 4.4.1 TWO characteristics of good quality semen

- Viability/mobility/mobility/80% mobility/less than 15% dead sperm cells ✓
- Colour/opaque/milky white ✓
- Volume ✓
- Odour ✓
- pH between 6,4 6,9/slightly acidic pH ✓
- Percentage of sperm cells with defects/morphology/less than 20% deformation/fewer deformities ✓
- Concentration ✓
- No blood in semen ✓ (Any 2) (2)

### 4.4.2 Functions of the dilutants of semen

- (a) Provides energy for sperm cells  $\checkmark$  (1)
- (b) Protects sperm cells against temperature changes/damage (1) from freezing ✓
- (c) Protects sperm cells against bacterial growth/infections  $\checkmark$  (1)

(Any 2)

(Any 2)

(Any 2)

(2)

(2)

(1) (1)

(2)

(1)

(1)

(1)

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	4.4.3	<ul> <li>TWO disadvantages of Al</li> <li>Labour intensive procedure ✓</li> <li>Time consuming ✓</li> <li>Incompetent operator can harm/damage cows ✓</li> <li>Diseases can spread quickly/easily ✓</li> <li>Genetic abnormalities can spread quickly/easily ✓</li> <li>Heat detection is difficult under extensive farming cont</li> <li>Expensive in terms of storage/testing ✓</li> <li>Not always successful/improper handling can decrease conception rate ✓</li> <li>Inbreeding may occur ✓</li> <li>Genetic variability is reduced ✓</li> <li>High levels of management is needed ✓</li> </ul>	ıditions √ se (Any 2)
	4.4.4	<ul> <li>TWO congenital defects in bulls</li> <li>Cryptorchidism ✓</li> <li>Hermaphroditism ✓</li> <li>Hypoplasia ✓</li> <li>Sperm defects ✓</li> </ul>	(Any 2)
4.5	The m	nembrane layers around the embryo	
	4.5.1	Identification of the membranesAAllantois ✓DChorion ✓	
	4.5.2	<ul> <li>TWO functions of the fluid in B</li> <li>Protects the embryo against shock/injuries ✓</li> <li>Protects the embryo against temperature changes ✓</li> <li>Protection from the attachment to other tissues ✓</li> <li>Prevent dehydration/desiccation ✓</li> <li>Lubrication of the birth canal ✓</li> </ul>	(Any 2)
	4.5.3	The role of membrane D Connects the foetus to the uterine wall/attachment/forms plac	enta 🗸

#### 4.5.4 The last stage of pregnancy Foetal stage ✓

#### The milk production of a dairy cow 4.6

4.6.1	Identification of the process illustrated above Lactation ✓	(1)
4.6.2	Indication of the time (in weeks) when the following occurred (a) Week 44 ✓	(1)

- Week 0 ✓ (b)
- Week 4 ✓ (1) (C)

# 4.6.3 THREE factors influencing the quantity of milk produced during the peak production

- Nutrition ✓
- Climatic/environmental conditions/housing/shelter ✓
- Individuality ✓
- Breed ✓
- Age of the cow ✓
- Number of times a cow is milked during the day ✓
- Health status ✓

(Any 3) (3) [**35**]

- TOTAL SECTION B: 105
  - GRAND TOTAL: 150