Education and Sport Development

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NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

SEPTEMBER 2019

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓		
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	A ✓✓		
	1.1.5	B ✓✓		
	1.1.6	B ✓✓		
	1.1.7	B ✓✓		
	1.1.8	A ✓✓		
	1.1.9	C ✓✓		
	1.1.10	D ✓✓	(10 x 2)	(20)
1.2	1.2.1	B only ✓✓		
	1.2.2	A only ✓✓		
	1.2.3	None ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	Both A and B ✓✓	(5 x 2)	(10)
1.3	1.3.1	Fodder flow ✓✓		
	1.3.2	Intensive ✓✓		
	1.3.3	Sertoli cells ✓✓		
	1.3.4	Fallopian tube/Oviducts/Ampula/isthmus ✓✓		
	1.3.5	Placenta ✓✓	(5 x 2)	(10)
1.4	1.4.1	Chyme ✓		
	1.4.2	Panoramic ✓		
	1.4.3	Teat opening/canal ✓		
	1.4.4	Spermatogenesis ✓		
	1.4.5	Infundibulum ✓	(5 x 1)	(5)
			TOTAL SECTION A:	**45**

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 The alimentary canal of a fowl

2.1.1 Identification of the part

A - Ventriculus/gizzard ✓ (1)
B - Duodenum/small intestine ✓ (1)

2.1.2 The structure that best fits the description

(a) Cloaca/vent ✓ (1)
(b) Proventriculus ✓ (1)

2.2 Energy needed for body functions

2.2.1 TDN in full

Total Digestible Nutrients ✓ (1)

2.2.2 Definition of the term Digestible Energy (DE)

- the energy lost ✓
- in the faeces ✓ (2)

2.2.3 Reason for the increased ME

- As farm animals grow/develop and their body mass increase, ✓
- more energy is required ✓ (2)

2.3 The nutrition of weaner pigs

2.3.1 The type of digestion where lactase and amylase are involved

Chemical digestion ✓ (1)

2.3.2 Explanation of the higher levels of lactase during the 2nd and 3rd weeks

- Before weaning, the piglets are dependent on milk ✓
- that requires the enzyme lactase to digest the lactose in milk ✓ (2)

2.3.3 TWO reasons for protein to young weaner pigs

- After weaning, piglets do not suckle milk any more ✓
- So they need protein for growth/development ✓
- For boosting of the immune system ✓
- For development of the reproductive organs ✓ (Any 2) (2)

2.4 Fodder flow planning for 50 beef cattle

2.4.1 Calculation of the total feed shortage for the period without supplementation

- Supplied by the veld: 160+160+140+120+80+60 = 720 tons ✓
- Required by the animals: 140 x 6 = 840 tons ✓
- Shortage/deficit = 120 tons ✓

OR

- 20+20+0+(-20)+(-60)+(-80) tons = (40 ï 160) tons ✓
- Shortage/deficit = 120 tons ✓ (3)

2.4.2 **Indicating**

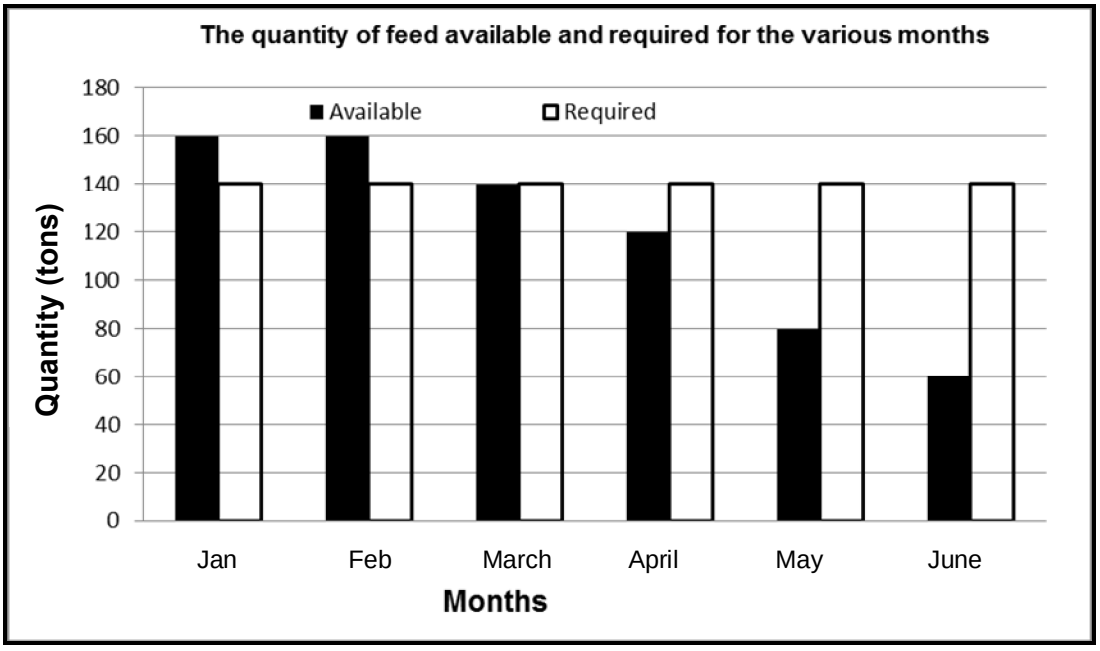
(a) The month with the highest feed shortage

June ✓ (1)

(b) TWO sustainable measures a farmer could take to solve the problem of feed shortage

- Harvest/store excess natural veld during the production season/making hay ✓
- Reduce numbers of cattle ✓
- Produce other crops/feeds/silage/planted pastures ✓ (Any 2) (2)

2.4.3 **Bar graph of the quantity of feed available and required for the various months of the year**



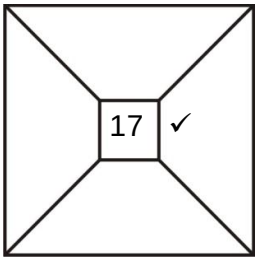
CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Months) ✓
- Y-axis: Correctly calibrated and labelled (Quantity) ✓
- Correct unit (tons) ✓
- Combined bar graph ✓
- Accuracy ✓ (6)

2.5 **Feeds a dairy farmer can use to compile a ration**

2.5.1 **Pearson square method**

Maize meal: 9% Maize meal: 27 parts ✓



Oil cake meal: 44% Oil cake meal: 8 parts ✓ (3)

2.5.2 **The percentage of maize meal in the ration**

- 27 + 8 = 35 parts
- 27 ÷ 35 x 100 ✓
- = 77,14/77% ✓ (2)

2.6 **Identification of the most suitable feeds**

2.6.1 Lucern ✓ (1)

2.6.2 Maize ✓ (1)

2.6.3 Maize ✓ (1)

2.6.4 Barley ✓ (1)
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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Ticks and their negative effects**

3.1.1 **TWO other negative effects of ticks to the enterprise**

- Damage the skin/hides ✓
- Time and labour intensive ✓
- High cost of treatment/chemicals ✓
- Damage to the teats/ears/udder ✓
- They cause secondary infections to increase ✓ (Any 2) (2)

3.1.2 **Ticks responsible for the diseases in cattle**

(a) Redwater - One host tick/blue tick ✓ (1)
(b) Heartwater - Three host tick/*bont* tick ✓ (1)

3.1.3 **Fly species on open wounds and tick bites in wool sheep**

Blowfly ✓ (1)

3.2 **Two animal production systems**

3.2.1 **Identification of illustration B**
Intensive production system ✓ (1)

3.2.2 **Differences in production outputs of illustration A and B.**
A - Low ✓
B - High ✓ (2)

3.2.3 **Examples of each production system**
A - Extensive/cattle on the veld ✓
B - Feedlot ✓ (2)

3.3 **Animal handling during production, before slaughtering, loading and transportation**

3.3.1 **TWO damages to the carcass due to improper handling**
- Bruising ✓
- Haemorrhages ✓
- Skin blemishes ✓
- Blood splashes ✓
- Broken bones ✓
- Contamination ✓ (Any 2) (2)

3.3.2 **TWO requirements for the loading ramps of vehicles**
- Incline not too steep ✓
- Not slippery/grid ✓
- Strong/save with high sides ✓
- Wide enough for only one animal at a time ✓
- Clean/hygienic ✓ (Any 2) (2)

3.3.3 **TWO factors farmers should bear in mind when handling cattle**
- Cattle are herd animals and should be handled as a group ✓
- A hierarchy develops where cattle feel comfortable/save ✓
- Cattle have a poor perception of depth ✓
- They have a flight zone which is smaller with calm/ docile animals (and vice versa) ✓ (Any 2) (2)

3.4 **Yearly mortalities of livestock in South Africa**

3.4.1 **TWO symptoms of ill health in farm animals**
- Lack or loss of appetite ✓
- Rough dull coat and hair loss ✓
- Isolation from the herd or flock ✓
- Lethargy ✓
- Head, ears and tail are hanging ✓
- Discharge from nose, eyes and/or reproductive tract ✓
- Eyes dull and glassy ✓
- Teeth grinding ✓
- Fever ✓
- Laboured breathing/sneezing/coughing ✓
- Dirty hocks/tail area ✓
- Discoloured urine ✓ (Any 2) (2)

3.4.2 **TWO precautionary measures that the farmer can take**

- Medicine to be safe/appropriate for the type of animal/disease ✓
- Check the expiry date ✓
- Medicine should be stored properly/according to instructions ✓
- Provide the correct dosage according to weight/age ✓
- Administer at the correct time/according to the instructions ✓
- Use the correct method/according to the instructions ✓
- Do not use the products within the withdrawal period ✓
- Use a new/sterilised needle/syringe for each animal ✓ (Any 2) (2)

3.4.3 **Explanation why 6% of adult cattle die compared to 22% of young animals**

- Diseases are not easily detected and treated in young animals ✓
- An effective disease control program can be administrated more effectively in older animals ✓
- Animals are inoculated as a precautionary measure, but sometimes not early enough ✓
- Diseases are not detected in younger animals ✓
- Irregular disease control with younger animals ✓
- Bad health management/observation in younger animals ✓
- Malnutrition, while young animals do not have the strength to survive ✓ (Any 2) (2)

3.5 **Farm animals and the way they loses heat**

3.5.1 **Identification of the heat energy loss in farm animals**

B - Conduction ✓
C - Excretion/defecation/faeces ✓ (2)

3.5.2 **TWO signs of heat stress in farm animals**

- Excessive salivation/drooling ✓
- Drop/decrease in production ✓
- Excessive panting/high respiratory rate/sweating ✓
- Open mouth breathing with tongue hanging out ✓
- Loss of appetite ✓
- Cattle move away from each another ✓
- Sheep bunch together ✓
- Restlessness ✓ (Any 2) (2)

3.5.3 **TWO management practices to reduce heats stress in A**

- Provision of shelter/shade/trees for shade ✓
- Breeding of heat adapted animals ✓
- Work calmly/peacefully with animals ✓
- Access to enough clean drinking water ✓ (Any 2) (2)

3.6 **Diseases in farm animals**

3.6.1 **The missing information for the letters**
A - Virus ✓
B - Bloody discharge from the nose, mouth and rectum ✓
C - Protozoa ✓
D - Ringworm ✓
E - Poultry ✓ (5)

3.6.2 **The role of the state to ensure animal health**
- Legislation with regard to animal health ✓
- Quarantine services ✓
- Control measures ✓
- Animal health schemes ✓
- Import and export bans ✓
- Vaccines ✓
- Transport permits ✓
- Veterinary services ✓
- Research ✓ (Any 2) (2)

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QUESTION 4: ANIMAL REPRODUCTION

4.1 **The reproductive system of a bull**

4.1.1 **Identification of part I**
Vas deferens ✓ (1)

4.1.2 **One term for parts A, B and J**
Secondary male reproductive organs ✓ (1)

4.1.3 **Letter of the part producing a buffer that protects sperm cells again acid in the reproductive system of the female**
G ✓ (1)

4.1.4 **The condition that occurs**
(a) Cryptorchidism ✓ (1)
(b) Hermaphroditism ✓ (1)

4.1.5 **Function of structure E**
Temperature regulation of the testes ✓ (1)

4.2 **The male and female reproductive systems**

4.2.1 **Distinction between the concepts**
Sterility - Bulls are totally/permanently infertile/ produces no viable sperm ✓ (1)
Infertility - Bulls are temporary infertile due to diseases/medication/ physical conditions/situations ✓ (1)

4.2.2 **The effect of nutrition on the reproductive potential of cows**
- Malnutrition/over/under feeding have a ✓
- Negative impact on the reproductive performance ✓

OR
- Good feeding has a ✓
- Positive impact on the reproduction performance of animals ✓ (2)

4.2.3 **The part in cows where hypoplasia usually occurs**
Ovaries/fallopian tubes ✓ (1)

4.3 **Levels of the hormones oestrogen and progesterone**

4.3.1 **Identification of the day when the oestrogen level is the highest**
Day 14 ✓ (1)

4.3.2 **Prove that fertilisation occurred on day 26**
- Progesterone levels are high/stable/continuous ✓
- Oestrogen levels are low/dropping ✓ (2)

4.3.3 **Day when oestrogen levels will peak again**
Day 35 ✓ (1)

4.3.4 **Reason for the answer**
If the cow is not pregnant she will be in oestrus 21 days later/
14+21 = 35 ✓ (1)

4.3.5 **The hormone responsible for the membrane to rapture**
Luteinising hormone (LH) ✓ (1)

4.4 **Apparatus used during AI**

4.4.1 **Identification of**
A - Pistolette ✓
B - AI canister/tank ✓ (2)

4.4.2 **Describe the concept artificial insemination (AI)**
- Process where semen is artificially collected from bulls and ✓
- artificially deposited into the reproduction canal of cows ✓ (2)

4.4.3 **The temperature of apparatus B**
– 196 °C ✓ (1)

4.4.4 **Explanation of the best time to inseminate**
- When oestrus is observed in the morning, AI in the afternoon ✓
- When oestrus is observed in the afternoon, AI the next morning ✓ (2)

4.5 **Herd management for cows to calve once a year**

4.5.1 **The length of gestation period (in days)**
280 - 285 ✓ (1)

4.5.2 **Expected calving if the cow was serviced in March 2019**
December 2019 ✓ (1)

4.5.3 **The condition where heifers struggle to calf**
Dystocia/complicated calving ✓ (1)

4.5.4 **Description of the term colostrum**
- A yellowish/salty/creamy liquid ✓
- produced by female animals directly after parturition to supply ✓
- antibodies/nutrition/growth factors to the calve ✓ (Any 2) (2)

4.6 **Technique to improve the reproduction in the enterprise**

4.6.1 **The technique best suited for the following**
(a) Synchronisation ✓ (1)
(b) Embryo-transfer ✓ (1)
(c) Cloning ✓ (1)

4.6.2 **The purpose of synchronisation**
To bring a group of female animals on heat/in oestrus at approximately the same time with the help of hormones ✓ (1)

4.6.3 **TWO disadvantages of the techniques above**
- Technique is expensive/time consuming/require good timing ✓
- Require good nutrition-/health conditions/management ✓
- Require high levels of knowledge/technology/no guarantees ✓
- Ethical issues ✓ (Any 2) (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

MEASURING/ANALYSIS GRID:

WEIGHTING OF QUESTIONS IN TERMS OF COGNITIVE LEVELS, KNOWLEDGE AREAS, AIMS & OBJECTIVES AND SKILLS:

Question Number.	Bloom`s Taxonomy			Knowledge			Aims & Objectives					Total	Skills / Types of Questions (Use a Tick)						
	Knowledge (A)	Comprehension (B) / Application (B)	Analysis (C) / Synthesis (C) / Evaluation (C)	GRADE 12			(ONLY TICK)					Number of marks allocated to question	Interpretation of Graphs	Plotting of data/Drawing of graphs	Making drawings/diagrams/schematic representations	Identifying labels/Labelling	Extraction and/or manipulation and/or evaluation of data	Organizing/Recording and re oorganizing data	Planning and designing experiments
				Animal nutrition	Animal production protection and control	Animal reproduction	Management and care of the environment	Problem solving mechanisms	Social and economic development	informed and responsible citizens	Agricultural indigenous knowledge								
SECTION A																			
Question 1																			
	A	B	C	AN	AP/P/C	AR	1	2	3	4	5	TOT	I	P	D	L	E	O	S
1.1	12	8		8	8	4	✓	✓		✓	✓	**20**	✓			✓	✓	✓	
1.2	10			4	4	2	✓	✓	✓	✓		**10**	✓			✓	✓	✓	
1.3	8	2		2	2	6	✓	✓		✓		**10**				✓	✓	✓	
1.4	4	1		1	1	3	✓		✓	✓		**5**	✓			✓	✓	✓	
Sub-total A	34	11		15	15	15	✓	✓	✓	✓	✓	**45**	✓			✓	✓	✓	

SECTION B																			
Question 2																			
	A	**B**	**C**	**AN**	**AP/P/C**	**AR/**	**1**	**2**	**3**	**4**	**5**	**TOT**	**I**	**P**	**D**	**L**	**E**	**O**	**S**
2.1		4		4			✓	✓			✓	**4**				✓	✓	✓	
2.2	3	2		5			✓			✓		**5**				✓	✓	✓	
2.3		3	2	5			✓	✓	✓	✓		**5**						✓	
2.4			12	12			✓	✓	✓	✓	✓	**12**						✓	
2.5			5	5			✓	✓	✓	✓		**5**				✓	✓	✓	
2.6		4		4			✓	✓	✓	✓		**4**						✓	
Sub-total	**3**	**13**	**19**	**35**			✓	✓	✓	✓	✓	**35**				✓	✓	✓	
Question 3																			
	A	**B**	**C**	**AN**	**APPC**	**AR**	**1**	**2**	**3**	**4**	**5**	**TOT**	**I**	**P**	**D**	**L**	**E**	**O**	**S**
3.1		5			5		✓	✓			✓	**5**				✓	✓	✓	
3.2	1	2	2		5		✓	✓		✓	✓	**5**	✓			✓	✓	✓	
3.3		6			6		✓	✓		✓	✓	**6**	✓			✓	✓	✓	
3.4	2	2	2		6		✓	✓				**6**				✓	✓	✓	
3.5	4	2			6		✓	✓		✓	✓	**6**				✓	✓	✓	
3.6		2	5		7		✓	✓		✓	✓	**7**	✓			✓	✓	✓	
Sub-total	**7**	**19**	**9**		**35**		✓	✓		✓	✓	**35**	✓			✓	✓	✓	
Question 4																			
	A	**B**	**C**	**AN**	**AP/PC**	**AR**	**1**	**2**	**3**	**4**	**5**	**TOT**	**I**	**P**	**D**	**L**	**E**	**O**	**S**
4.1	2	4				6	✓	✓		✓		**6**	✓				✓	✓	
4.2	2	3				5	✓	✓	✓	✓	✓	**5**	✓	✓	✓	✓	✓	✓	
4.3	1	3	2			6	✓	✓	✓	✓	✓	**6**				✓	✓	✓	
4.4	5	2				7	✓	✓		✓		**7**	✓			✓	✓	✓	
4.5	4	1				5	✓	✓	✓	✓	✓	**5**				✓	✓	✓	
4.6	2	4				6	✓	✓		✓		**6**	✓			✓	✓	✓	
Sub-total	**16**	**17**	**2**			**35**	✓	✓	✓	✓	✓	**35**	✓	✓	✓	✓	✓	✓	
Sub-total B	**26**	**49**	**30**	**35**	**35**	**35**						**105**							
Sub-total A	**34**	**11**		**15**	**15**	**15**						**45**							
Total	**60**	**60**	**30**	**50**	**50**	**50**						**150**							
Norm	**60**	**60**	**30**	**50**	**50**	**50**	✓	✓	✓	✓	✓	**150**	✓	✓	✓	✓	✓	✓	✓