



# basic education

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

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P1**

**NOVEMBER 2021**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 10 pages.**

**SECTION A****QUESTION 1**

1.1	1.1.1	B ✓✓	(10 x 2)	(20)
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	A ✓✓		
	1.1.5	B ✓✓		
	1.1.6	A ✓✓		
	1.1.7	C ✓✓		
	1.1.8	C ✓✓		
	1.1.9	A ✓✓		
	1.1.10	C ✓✓		
1.2	1.2.1	B only ✓✓	(5 x 2)	(10)
	1.2.2	Both A and B ✓✓		
	1.2.3	A only ✓✓		
	1.2.4	None ✓✓		
	1.2.5	None ✓✓		
1.3	1.3.1	Gross energy/GE ✓✓	(5 x 2)	(10)
	1.3.2	Vector ✓✓		
	1.3.3	Placenta retention/retained placenta ✓✓		
	1.3.4	Spermatogenesis ✓✓		
	1.3.5	Pedometer ✓✓		
1.4	1.4.1	Vitamin A/retinol ✓	(5 x 1)	(5)
	1.4.2	Neck/head clamp/head gate ✓		
	1.4.3	Urethra ✓		
	1.4.4	Lactation ✓		
	1.4.5	Impotence ✓		
<b>TOTAL SECTION A:</b>			<b>45</b>	

**SECTION B****QUESTION 2: ANIMAL NUTRITION****2.1 Feed intake****2.1.1 Indication of the name of the animal****COLUMN A** - Pig ✓

(1)

**COLUMN B** - Fowl/chicken/poultry ✓

(1)

**2.1.2 Reason****COLUMN A**

- Chemical digestion starts from the mouth through amylase ✓
- Ingest food using the lips and tongue ✓
- The teeth grind the food ✓
- Food is pushed down the oesophagus into the stomach where it is digested further by enzymes ✓ (Any 1)

(1)

**COLUMN B**

- Animal ingest food by pecking ✓
- Food is moistened, softened and stored ✓
- Physical and chemical digestion occur in stomach ✓ (Any 1)

(1)

**2.1.3 Stating the structural difference in the large intestines of animals****COLUMN A** - There is one caecum/blind gut/colon of the pig is long/ there is a rectum ✓

(1)

**COLUMN B** - There are two caeca/blind gut/colon of a chicken is short/no rectum ✓

(1)

**2.2 Parts of the alimentary canal****2.2.1 Identification of the letter****(a)** C ✓

(1)

**(b)** A ✓

(1)

**2.2.2 TWO digestive juices deposited in small intestines**

- Bile ✓
- Pancreatic juice ✓

(2)

**2.2.3 Fat digestive enzyme secreted in pancreas**

Lipase ✓

(1)

**2.2.4 TWO reasons for breaking down of fat by bile**

- To increase the surface area ✓
- Allows lipase to work better/to enhance chemical digestion ✓
- To improve the absorption of fatty acids/assists with the absorption of fat-soluble vitamins A,D,E,K ✓ (Any 2)

(2)

2.3 **Mineral deficiency**2.3.1 **Naming the mineral deficient in animal**

Phosphorus/P ✓

(1)

2.3.2 **Name of the condition**

Pica ✓

(1)

2.3.3 **Indication of the feed**

Bone meal/mineral lick ✓

(1)

2.4 **Feeds**2.4.1 **Classification of feeds****Maize meal** - Concentrates ✓

(1)

**Maize stalk** - Roughages ✓

(1)

2.4.2 **Importance of feeding roughage in****(a) Young ruminant**

Stimulate the development of rumen/fore stomach ✓

(1)

**(b) Adult ruminant**

- Normal functioning of the rumen/prevents bloating ✓
- Stimulates production of butterfat in milk ✓
- Supply bulkiness to the ration ✓
- Provides energy for maintenance ✓

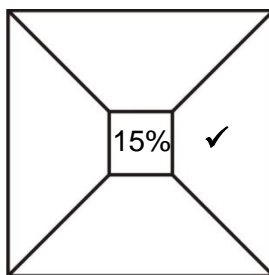
(Any 1)

(1)

2.4.3 **Calculation of the ratio to which maize meal and fish meal be mixed to get a feed with 15% DP**

Maize meal 9%

21 parts ✓



Fish meal 36%

6 parts ✓

Maize meal : Fish meal 21 : 6 ✓ OR Fishmeal : Maize meal 6 : 21 ✓

(4)

**2.5 Digestibility coefficient****2.5.1 Digestibility co-efficiency**

$$DM = 15 \text{ kg} \times 84\% (0,84) = 12,6 \text{ kg} \checkmark \quad \text{OR} \quad \frac{84}{100} \times 15 \text{ kg} = 12,6 \text{ kg} \checkmark$$

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

$$= \frac{12,6 \text{ kg} - 3,5 \text{ kg}}{12,6 \text{ kg}} \times \frac{100}{1} \checkmark$$

$$= 72,2 \checkmark \% \checkmark$$

(5)

**2.5.2 The percentage of the excreted material**

$$27,8\% \checkmark$$

(1)

**2.6 Fodder flow programme****2.6.1 The month in which to reduce the number of farm animals**June  $\checkmark$ 

(1)

**2.6.2 Reason**

- Feed availability is at its lowest (100 kg/ha)  $\checkmark$
- More supplementary feed required (8 kg/animal/day)  $\checkmark$  (Any 1)

(1)

**2.6.3 Calculation of the total feed available for April (in tons) if 5 ha are available for grazing**

$$800 \text{ kg/ha} \times 5 \text{ ha} = 4\,000 \text{ kg} \checkmark \quad \text{OR} \quad \frac{800 \text{ kg/ha}}{1\,000 \text{ kg}} \checkmark$$

$$= \frac{4\,000 \text{ kg}}{1\,000 \text{ kg}} \checkmark$$

$$= 0,8 \text{ tons} \times 5 \text{ ha} \checkmark$$

$$= 4 \text{ tons} \checkmark$$

$$= 4 \text{ tons} \checkmark$$

(3)

**[35]**

**QUESTION 3 : ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Heat stress in dairy cattle****3.1.1 TWO visible ways cattle use to decrease the effects of heat**

- Standing under trees/shade for protection from sun ✓
  - Standing inside the water to cool the body ✓
  - Standing apart/away from each other ✓
- (Any 2) (2)

**3.1.2 TWO importance of shelter for animals**

- Increases young animals' survival rate ✓
  - Protects animals from predators/theft ✓
  - Enables control of diseases and parasites ✓
  - Provides an ideal temperature/protects animal against adverse weather conditions ✓
  - Prevents dehydration ✓
  - Maximize production ✓
- (Any 2) (2)

**3.1.3 TWO requirements for the vehicle transporting farm animals**

- Floors should not be slippery ✓
  - Adequate ventilation ✓
  - Rails must be high and strong ✓
  - No sharp edges that can harm/hurt animals ✓
  - Vehicles should be clean/hygienic ✓
  - Must have enough space ✓
- (Any 2) (2)

**3.2 The effect of environmental temperature****3.2.1 The farm product**

Milk ✓ (1)

**3.2.2 Description of the relationship between dry matter intake, milk yield and water intake**

With increased environmental temperatures dairy cows will eat less feed ✓ less milk will be produced ✓ and will drink more water ✓ (3)

**3.3 Production systems****3.3.1 Identification of the production systems**

- (a) Farmer B ✓ (1)  
(b) Farmer A ✓ (1)

**3.3.2 Justification**

- (a) **Extensive production system**  
It took the herd longer to reach the live weight of 550 kg/  
slower growth rate ✓ (1)
- (b) **Intensive production system**  
It took the herd less time to reach the live weight of 550 kg/  
faster growth rate ✓ (1)

**3.3.3 A disadvantage in relation to input costs**

Input costs are high/it is expensive ✓ (1)

- 3.4 FMD in farm animals**
- 3.4.1 The pathogen causing FMD**  
Virus ✓ (1)
- 3.4.2 TWO main symptoms of FMD in farm animals**
- Blister-like lesions ✓
  - Painful ulcers ✓
  - Sticky, foamy salivation ✓
  - Severe lameness /unable to walk/limping ✓
  - Nasal discharge ✓ (Any 2) (2)
- 3.4.3 TWO roles of state in controlling animal diseases**
- Public awareness/report the outbreak of FMD ✓
  - Quarantine services/separation/isolation of infected animals ✓
  - Veterinarian services ✓
  - Banning of exports ✓ (Any 2) (2)
- 3.4.4 TWO economic impact of FMD**
- International trade decreases/export bans ✓
  - Reduce food security ✓
  - Decreased production ✓
  - Loss of income/profit/jobs ✓
  - Costs to control, prevent and treat animals are high ✓
  - Death of an animal/stock losses ✓ (Any 2) (2)
- 3.5 Methods used to administer medication to farm animals**
- 3.5.1 Identification of the pictures**
- Picture A ✓
  - Picture B ✓
  - Picture D ✓ (Any 2) (2)
- 3.5.2 Identification of the pictures**
- Picture B ✓
  - Picture C ✓ (2)
- 3.6 Different organisms harmful to farm animals**
- 3.6.1 Term referring to the organisms in pictures A, B, C and D**  
Parasites ✓ (1)
- 3.6.2 Classification of the organisms**
- **PICTURE B** - External/ecto parasite ✓ (1)
  - **PICTURE C** - Internal/endo parasite ✓ (1)
- 3.6.3 Identification of the letter**
- (a) **Redwater** - B/Blue tick ✓ (1)
  - (b) **Rift Valley Fever (RVF)** - A/mosquito ✓ (1)
  - (c) **Heartwater** - D/Bont tick ✓ (1)

3.7 **THREE plants that are poisonous to farm animals**

- Thorn apple/devil's apple ✓
- Poison bulb/slangkop ✓
- Poison ivy ✓
- Maize fungus ✓
- Lantana camara ✓
- Tulip ✓
- Seneciosis ✓
- Gousiektebossie ✓
- Diplodiosis ✓
- Poison leaf/gifblaar ✓
- Geeldikkop ✓
- Gousiekte ✓
- Vermeersiekte ✓

(Any 3)

(3)  
[35]**QUESTION 4: ANIMAL REPRODUCTION**4.1 **Female reproductive system**4.1.1 **Identification of the TWO secondary sex organs**

- B ✓
- C ✓
- D ✓
- E ✓

(Any 2)

(2)

4.1.2 **Providing the letter**(a) **The site of fertilisation - B ✓**

(1)

(b) **Glands secreting nutrients - C ✓**

(1)

4.1.3 **TWO functions of the cervix (Part D)**(a) **Opens to allow semen passage to the uterus ✓**

(1)

(b) **Closes the uterus through the thick mucus secretion/mucus plug to prevent microbial infection of the uterus ✓**

(1)

4.2 **Hormone levels**4.2.1 **Definition of the concept oestrus**

The period when non-pregnant female animals ✓ will be receptive to male animals/will allow mating ✓

(2)

4.2.2 **Indication whether the female farm animal is pregnant or not**

The female animal is not pregnant ✓

(1)

4.2.3 **Reason**

The animal is showing a normal oestrus cycle/the level of progesterone is decreasing/the level of oestrogen is increasing/re-appearance of oestrus ✓

(1)

4.2.4 **Indication of the levels of FSH**

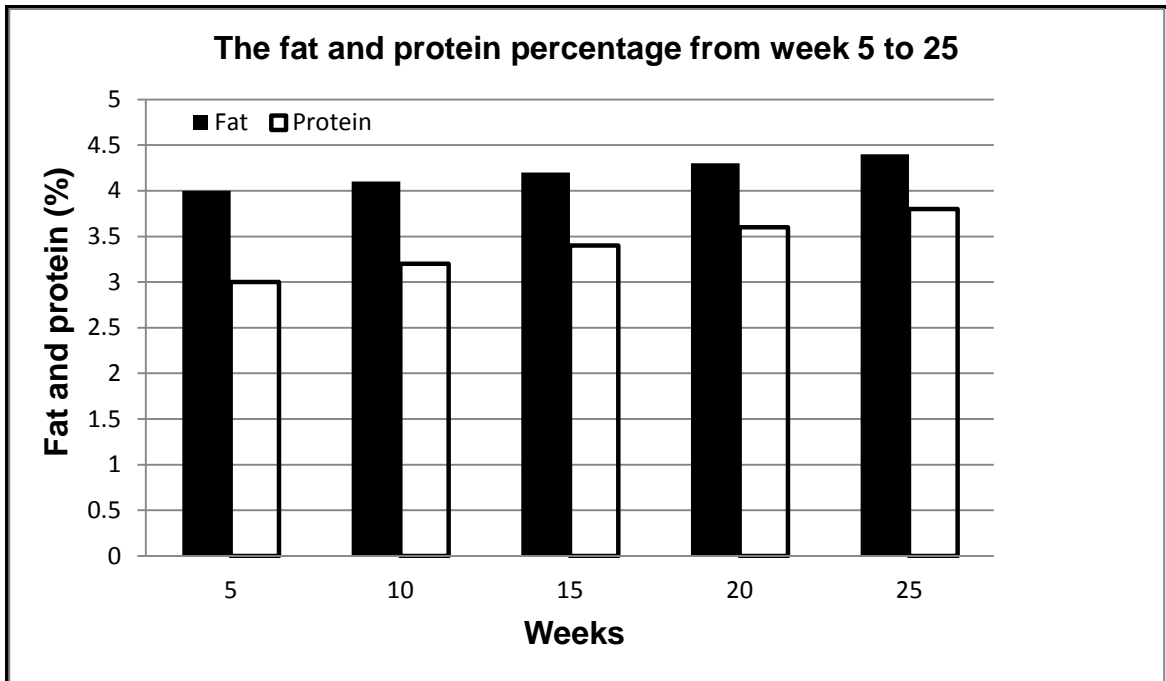
FSH level will be high ✓

(1)



### 4.3 Bar graph

#### 4.3.1 Bar graph showing the fat and protein percentages from weeks 5 to 25



#### CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X-axis: correct calibrations and labelled (Weeks) ✓
- Y-axis: correct calibrations and labelled (Fat and protein) ✓
- Correct unit (%) ✓
- Combined bar graph ✓
- Accuracy ✓

(6)

### 4.4 Synchronisation of oestrus

#### 4.4.1 Identification of the process

Synchronisation of oestrus ✓

(1)

#### 4.4.2 TWO techniques/methods to induce synchronisation of oestrus

- Prostaglandin injection ✓
- Synthetic progesterone/oestradiol injection ✓
- Gonadotropin-releasing hormone/GnRH injection ✓
- Vaginal insertion (CIDR) ✓
- MGA/PG mixed with feed ✓

(Any 2) (2)

4.4.3	<b>TWO disadvantages of the synchronisation of oestrus</b>		
	<ul style="list-style-type: none"> <li>• High management inputs/skills/technology are required ✓</li> <li>• Adequate facilities are required ✓</li> <li>• High costs/expensive ✓</li> <li>• Labour intensive ✓</li> <li>• Time consuming ✓</li> <li>• Pregnancy tests must be done frequently ✓</li> </ul>	(Any 2)	(2)
4.5	<b>Re-arrangement of the stages of mating in sequential order</b>		
	• C ✓		(1)
	• D ✓		(1)
	• A ✓		(1)
	• E ✓		(1)
	• B ✓		(1)
4.6	<b>Parturition</b>		
4.6.1	<b>The stage of parturition in the diagram</b>		
	<ul style="list-style-type: none"> <li>• Expulsion/ejection of the foetus ✓</li> <li>• Delivery ✓</li> </ul>	(Any 1)	(1)
4.6.2	<b>Term for birth difficulty</b>		
	Dystocia ✓		(1)
4.6.3	<b>TWO problems with the calf</b>		
	<ul style="list-style-type: none"> <li>• Calves with high birth weights/large calves ✓</li> <li>• Bull calves normally have higher birth weights ✓</li> <li>• Malformed calves/congenital defects/hydrocephalus ✓</li> <li>• Multiple births/twins ✓</li> <li>• Incorrect position of the calf/posterior presentation ✓</li> </ul>	(Any 2)	(2)
4.7	<b>Multiple births</b>		
4.7.1	<b>Identification of the type of multiple births</b>		
	(a) A - Identical/monozygotic twins ✓		(1)
	(b) B - Fraternal/non-identical/dizygotic twins ✓		(1)
4.7.2	<b>Differentiation between</b>		
	<b>Monozygotic</b> - Formed from the fertilisation of a single ovum ✓		(1)
	<b>Dizygotic</b> - Formed from the fertilisation of two different ova ✓		(1)
			<b>[35]</b>
	<b>TOTAL SECTION B:</b>		<b>105</b>
	<b>GRAND TOTAL:</b>		<b>150</b>