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basic education

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 ✓		
TOTAL SECTION A:				45

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)

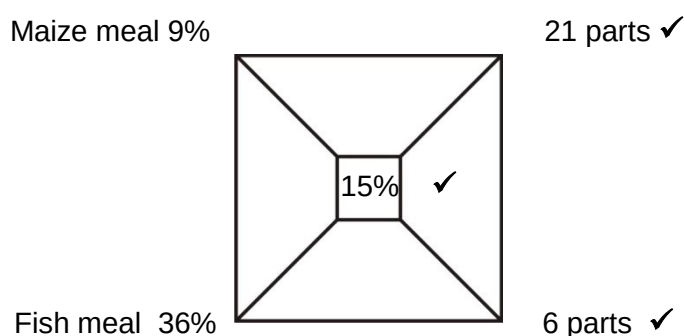
2.4 Feeds

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 : Fish meal 21 : 6 ✓ OR Fishmeal : Maize meal 6 : 21 ✓ (4)

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

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

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

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

$$= 72,2 \checkmark \% \checkmark \quad (5)$$

2.5.2 The percentage of the excreted material

$$27,8\% \checkmark \quad (1)$$

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

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

$$= \frac{4\,000 \text{ kg}}{1\,000 \text{ kg}} \checkmark \quad = 0,8 \text{ tons} \times 5 \text{ ha} \checkmark$$

$$= 4 \text{ tons} \checkmark \quad = 4 \text{ tons} \checkmark \quad (3)$$

[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 ✓
- **PICTURE C** - Internal/endo parasite ✓

(1)

(1)

3.6.3 Identification of the letter

- (a) **Redwater** - B/Blue tick ✓
- (b) **Rift Valley Fever (RVF)** - A/mosquito ✓
- (c) **Heartwater** - D/Bont tick ✓

(1)

(1)

(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

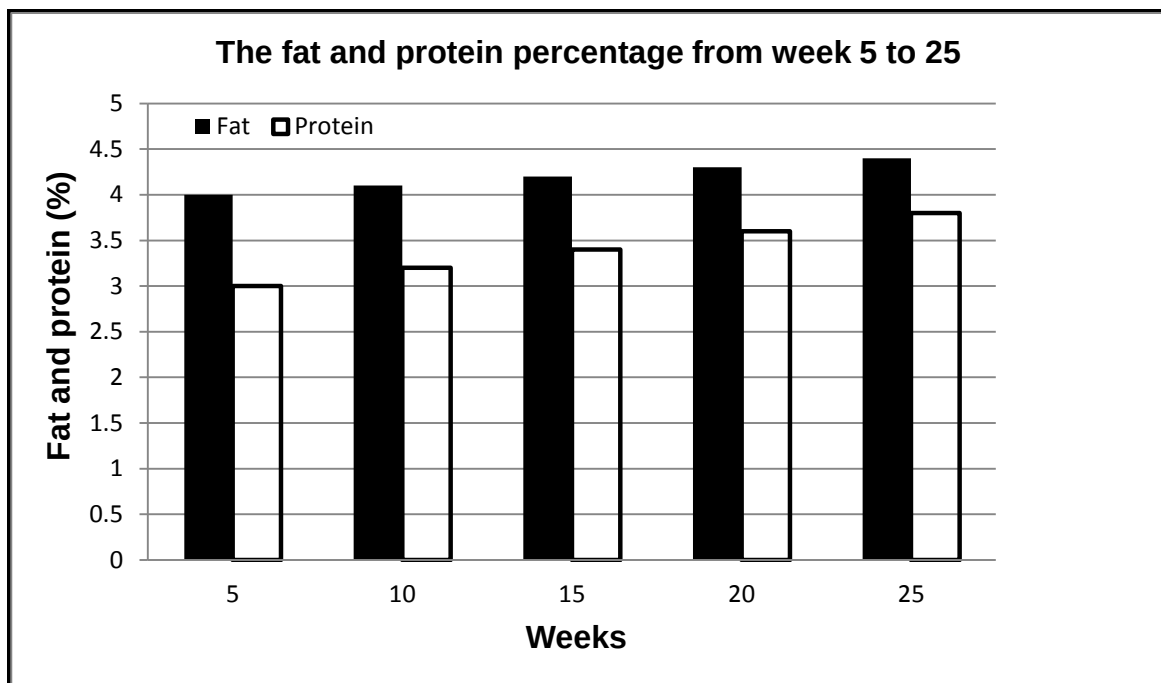
The animal is showing a normal oestrus cycle/the level of progesterone is decreasing/the level of oestrogen is increasing/re-appearance of oestrus ✓

(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 **TWO disadvantages of the synchronisation of oestrus**
- High management inputs/skills/technology are required ✓
 - Adequate facilities are required ✓
 - High costs/expensive ✓
 - Labour intensive ✓
 - Time consuming ✓
 - Pregnancy tests must be done frequently ✓ (Any 2) (2)
- 4.5 **Re-arrangement of the stages of mating in sequential order**
- C ✓ (1)
 - D ✓ (1)
 - A ✓ (1)
 - E ✓ (1)
 - B ✓ (1)
- 4.6 **Parturition**
- 4.6.1 **The stage of parturition in the diagram**
- Expulsion/ejection of the foetus ✓
 - Delivery ✓ (Any 1) (1)
- 4.6.2 **Term for birth difficulty**
Dystocia ✓ (1)
- 4.6.3 **TWO problems with the calf**
- Calves with high birth weights/large calves ✓
 - Bull calves normally have higher birth weights ✓
 - Malformed calves/congenital defects/hydrocephalus ✓
 - Multiple births/twins ✓
 - Incorrect position of the calf/posterior presentation ✓ (Any 2) (2)
- 4.7 **Multiple births**
- 4.7.1 **Identification of the type of multiple births**
- (a) A - Identical/monozygotic twins ✓ (1)
- (b) B - Fraternal/non-identical/dizygotic twins ✓ (1)
- 4.7.2 **Differentiation between**
- Monozygotic** - Formed from the fertilisation of a single ovum ✓ (1)
- Dizygotic** - Formed from the fertilisation of two different ova ✓ (1)
- [35]

TOTAL SECTION B: 105
GRAND TOTAL: 150