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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)

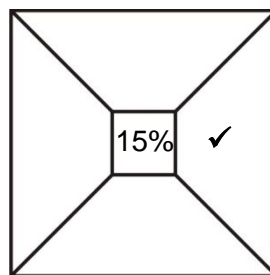
**2.4.3 Calculation of the ratio to which maize meal and fish meal be mixed to get a feed with 15% DP**

Maize meal 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**

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

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

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

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

**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**

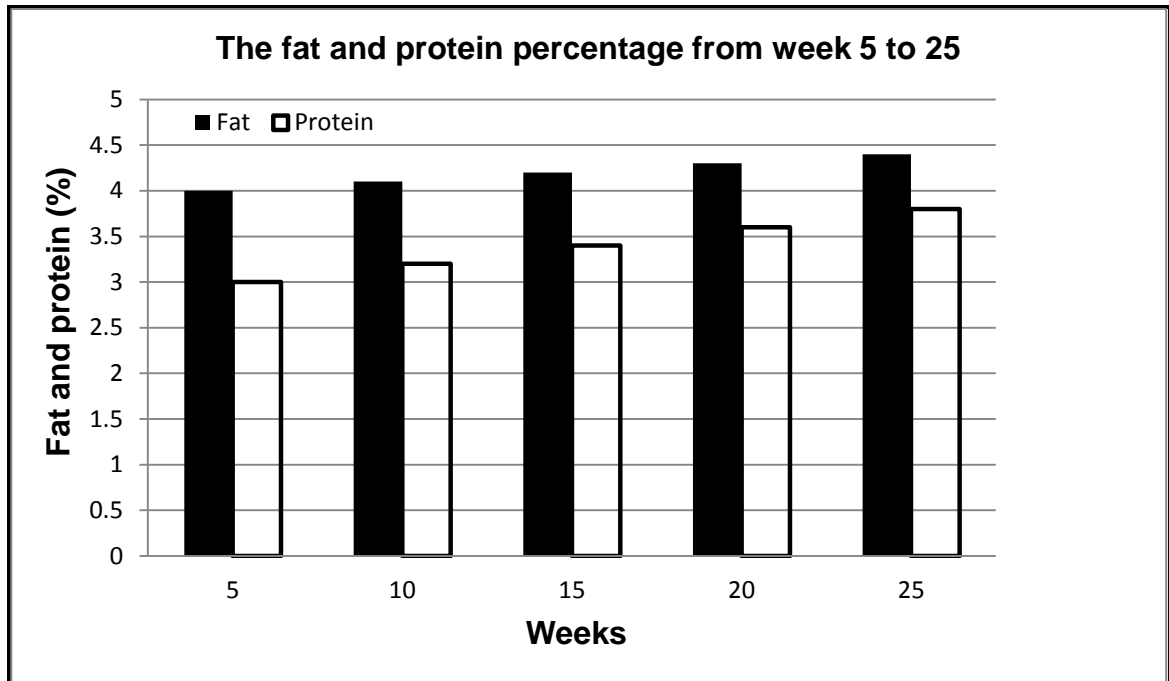
The animal is showing a normal oestrus cycle/the level of progesterone is decreasing/the level of oestrogen is increasing/re-appearance of oestrus ✓

(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**