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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

AGRICULTURAL SCIENCES P1

2022

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	D ✓✓		
	1.1.5	B ✓✓		
	1.1.6	A ✓✓		
	1.1.7	A ✓✓		
	1.1.8	B ✓✓		
	1.1.9	C ✓✓		
	1.1.10	A ✓✓	(10 x 2)	(20)
1.2	1.2.1	B only ✓✓		
	1.2.2	B only ✓✓		
	1.2.3	A only ✓✓		
	1.2.4	None ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Digestibility coefficient ✓✓		
	1.3.2	Sustainable medication/integrated disease management ✓✓		
	1.3.3	Placenta retention/retained placenta ✓✓		
	1.3.4	Embryo flushing/harvesting ✓✓		
	1.3.5	Mitochondrion ✓✓	(5 x 2)	(10)
1.4	1.4.1	Biological value/BV ✓		
	1.4.2	Drenching/dosing gun/syringe ✓		
	1.4.3	Natural mating/copulation ✓		
	1.4.4	Ectoderm ✓		
	1.4.5	Ejection/delivery/expulsion ✓	(5 x 1)	(5)
TOTAL SECTION A:				45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Stomach compartments of two ruminant farm animals**

- 2.1.1 **The development stage of the ruminant farm animal in A**
Young ruminant farm animal ✓ (1)
- 2.1.2 **TWO reasons**
- Presence of oesophagal groove ✓
 - Underdeveloped fore-stomach (rumen/reticulum/omasum) ✓
 - Large abomasum ✓ (Any 2) (2)
- 2.1.3 **Identification of the letter**
- (a) D ✓ (1)
- (b) C ✓ (1)
- 2.1.4 **Adaptation feature of part E /omasum**
It has folds/leaves that squeeze water from the feed ✓ (1)
- 2.1.5 **Fowl's stomach corresponding with the abomasum**
Proventriculus/glandular stomach ✓ (1)

2.2 Energy flow of feed

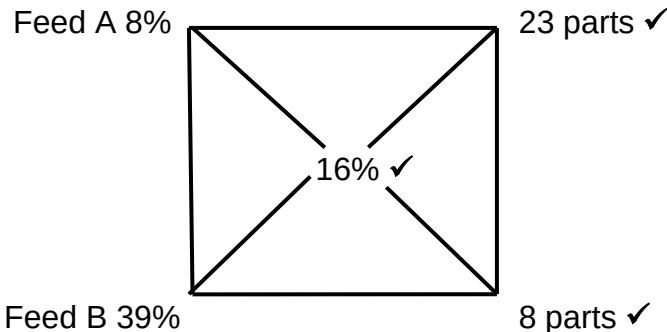
- 2.2.1 **Energy represented by A**
Metabolic energy/ME ✓ (1)
- 2.2.2 **Calculation of the digestible energy**
- DE = Gross Energy – energy lost through faeces ✓
 - DE = 850 joules – 255 joules ✓
 - DE = 595 joules ✓ (3)
- 2.2.3 **Importance of net energy**
- For growth/production/reproduction/work ✓
 - For maintenance ✓ (Any 1) (1)
- 2.2.4 **TWO aims of calculating energy value of the feed**
- To determine animal diet ✓
 - To determine feeding standards ✓
 - To determine ration formulation ✓ (Any 2) (2)

2.3 Nutritional composition of two feeds

- 2.3.1 **The purpose of using feed B**
- For growth ✓
 - For production ✓
 - For reproduction ✓ (Any 1) (1)

2.3.2 ONE reason

It has a high protein content (39%)/narrow NR (less than 1:6) ✓ (1)

2.3.3 Pearson square method

Ratio Feed A : Feed B is 23 : 8 ✓ (4)

2.4 Minerals, vitamins and deficiency symptoms

- (a) Zinc/Zn ✓ (1)
- (b) Night blindness/keratomalaise/malformation of bones/lower disease resistance/lower fertility/loss of appetite/diarrhoea ✓ (1)
- (c) Wasting disease/stunted growth/poor appetite/listlessness/drop in milk production/anaemia/cardiac failure/infertility ✓ (1)
- (d) Vitamin K ✓ (1)
- (e) Iron/Fe/Copper/Cu/vitamin B₆ ✓ (1)

2.5 Suitable components of feeds

- 2.5.1 Water ✓ (1)
- 2.5.2 Carbohydrates ✓ (1)
- 2.5.3 Fats/Oils/Lipids ✓ (1)

2.6 Types of feeds**2.6.1 Classification of feed types A and B**

- Feed types A - Concentrates ✓ (1)
- Feed types B - Roughages ✓ (1)

2.6.2 Identification of C

Carbohydrate-rich concentrates ✓ (1)

2.6.3 TWO functions of roughages(B)

- Enhance the development of rumen in young animals ✓
 - Stimulate milk production ✓
 - Provide bulkiness to the ration ✓
 - Prevent bloating in ruminants ✓
 - Improve digestion ✓
 - Providing energy ✓
- (Any 2) (2)

2.6.4 TWO feed examples of succulent roughages (D)

- Silage ✓
- Green fodder/pastures/soilage ✓
- Green lucerne ✓

(Any 2) (2)
[35]**QUESTION 3 : ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Animal production systems****3.1.1 Animal production system**

- **FARM A** - Intensive production system ✓ (1)
- **FARM B** - Extensive production system ✓ (1)

3.1.2 Reason for extensive production system

- **Space** - Large space ✓ (1)
- **Number of animals** - Fewer animals ✓ (1)

3.1.3 Indication of the high inputs

- 30 labourers ✓
- 3 x big tractors ✓
- Abattoir with equipment ✓ (Any 1) (1)

3.1.4 TWO ways of increasing animal productivity on farm B

- Correct feeding/nutrition/diet ✓
- Improving environment/provision of shelter ✓
- Breeding disease resistant animals ✓
- General production enterprise management ✓ (Any 2) (2)

3.2 Examples of intensive production systems**3.2.1 Matching the pictures**

- (a) Picture C ✓ (1)
- (b) Picture A ✓ (1)
- (c) Picture B ✓ (1)

3.2.2 TWO important reasons for shelter in farm animals

- To reduce effects of extreme weather conditions ✓
- Protect against predators/theft ✓
- Easy management ✓
- Improved production ✓ (Any 2) (2)

3.3 Broiler facility**3.3.1 Purpose of the curtains in the facility**

- Control light intensity ✓
- Regulate the temperature inside the house/ventilation ✓ (Any 1) (1)

3.3.2 TWO other equipment used to control temperature for chicks

- Insulators/bedding ✓
- Heating equipment when it is cold ✓
- Cooling equipment/ventilators when it is hot ✓ (Any 2) (2)

3.3.3 TWO factors to consider when building broiler facility

- Orientation of the building ✓
- Should allow air flow/ventilation ✓
- Slope to allow good drainage/prevent run-off water entering ✓
- Side walls should be insulated ✓
- Cost effective ✓
- Durability/strength ✓
- Insulated roofing material ✓

(Any 2) (2)

3.4 Animal diseases and parasites in farm animals**3.4.1 Completing the table**

- **A** - Virus ✓
- **B**
 - Chronic cough ✓
 - Squeaky breathing ✓
 - Dyspnea/enlarge lymph nodes ✓
- **C** - Protozoa ✓
- **D** - Ringworm ✓

(1)

(Any 1) (1)

(1)

(1)

3.4.2 Indication of the vector**E** - Bont tick/3-host tick ✓

(1)

3.4.3 TWO financial implications of animal diseases

- Decreased production/income/profit ✓
- Banning of exports/international trade decreases ✓
- Have negative impact on food security ✓
- High cost to control/prevention ✓

(Any 2) (2)

3.4.4 Identification of the disease transmitted from animals to humans

Tuberculosis/TB/ringworm ✓

(1)

3.5 Medication of farm animals**3.5.1 Method to administer medication**

Intramuscular injection ✓

(1)

3.5.2 Identification of the role of the state

Registration of the medication/Reg. No. F 2144/ACT 36/1947 ✓

(1)

3.5.3 Justification

The medication is retained in the body for four weeks ✓

(1)

3.5.4 TWO other methods to administer medication through injection

- Intravenous injection ✓
- Subcutaneous/hypodermic injection ✓
- Intradermal injection ✓
- Intraperitoneal injection ✓
- Intraruminal injection ✓
- Intramammary injection ✓

(Any 2) (2)

3.6 Plant poisoning**3.6.1 Identification of the poisonous plant**

Thorn apple/devil's apple/Jamestown weed/Jimson weed/stinkweed/
devil's trumpet/Datura stramonium ✓

(1)

3.6.2 TWO measures to prevent plant poisoning

- Remove the poisonous plant ✓
- Remove animals from camps infested with poisonous plant ✓
- Avoid overgrazing/practice rotational grazing ✓
- Feed animals well ✓
- Inspection of hay provided to farm animals ✓

(Any 2)

(2)

3.6.3 TWO ways to treat animals with plant poisoning

- Keep affected animal away from drinking water for two days, thereafter allow only small quantities of water ✓
- Administer activated charcoal/strong tea/tannic acid/remedies that will neutralise the plant poison ✓
- Provide large doses of purgative to expel poison ✓
- Dose the animal with sugar/glucose ✓

(Any 2)

(2)

[35]**QUESTION 4: ANIMAL REPRODUCTION****4.1 The reproductive system of a bull****4.1.1 Identification of**

- **B** - Scrotum ✓
- **C** - Epididymis ✓

(1)

(1)

4.1.2 The hormone secreted by the testis

Testosterone ✓

(1)

4.1.3 Condition when the testis remains in the body cavity

Cryptorchidism ✓

(1)

4.1.4 Role of the scrotum in regulating the temperature

In hot conditions the scrotum relaxes moving the testes away from the body ✓ in cooler conditions the scrotum contracts pulling the testes closer to the body ✓

(2)

4.2 Semen collection, dilution and preservation**4.2.1 TWO methods of collecting semen**

- Artificial vagina ✓
- Electrical stimulation/electro-ejaculator ✓

(2)

4.2.2 TWO requirements for semen collection

- All equipment that will be used should be readily available ✓
- Equipment must be hygienic/clean/sterilized ✓
- Floor area must not be slippery ✓
- Personnel must be trained/skilled with experience/expertise ✓

- Vial must be kept warm before and after collection ✓
- Enough handlers should be available ✓
- Teaser cow should be available ✓
- Semen must not be exposed to direct sunlight ✓ (Any 2) (2)

4.2.3 **TWO functions of semen dilutants**

- Provide nutrients/energy to the sperm cells ✓
- Prevent contamination by micro organisms ✓
- Protect sperm cells against pH changes ✓
- Protect sperm cells during freezing and thawing ✓
- Increase the volume of semen ✓
- Maintain proper osmotic/electrolyte pressure ✓
- Increase the viability of the sperm cells ✓ (Any 2) (2)

4.2.4 **Temperature requirement for semen storage**

–196 °C ✓ (1)

4.3 **Oogenesis**

4.3.1 **Identification of the process**

Oogenesis/ovogenesis ✓ (1)

4.3.2 **Type of cell divisions**

(a) B - Meiosis ✓ (1)

(b) A - Mitosis ✓ (1)

4.3.3 **Purpose of meiosis**

- Reduce the number of chromosomes from diploid (2n) to haploid (n) ✓
- To form gametes ✓ (Any 1) (1)

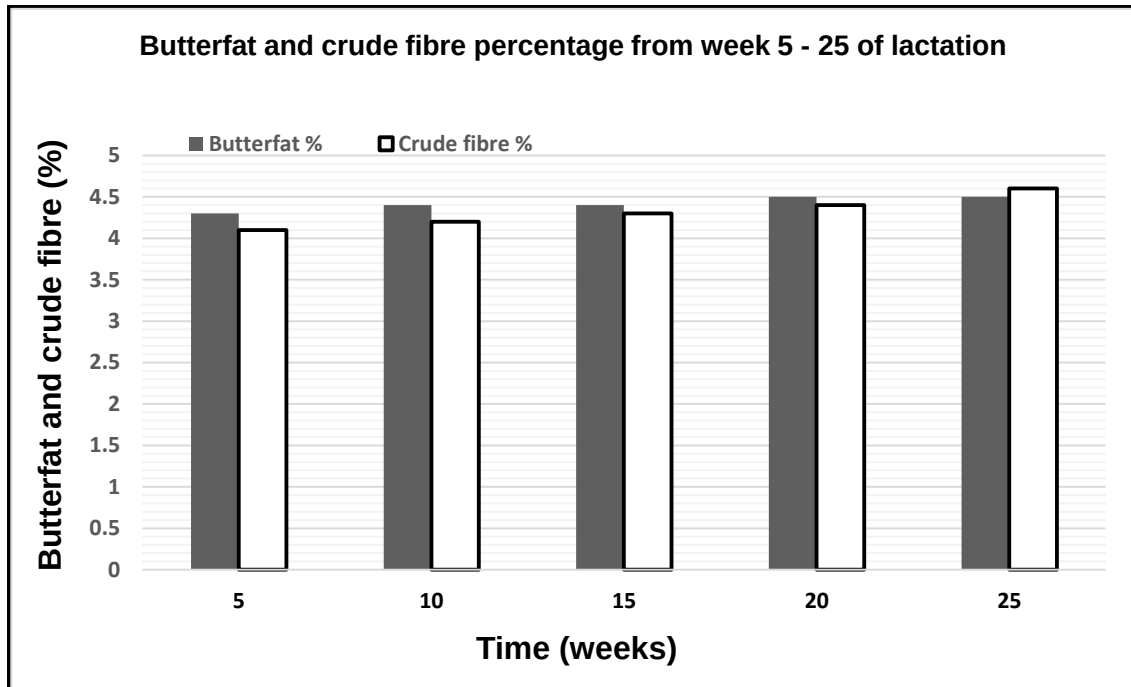
4.3.4 **Organ where the following cells can be found**

(a) Spermatogonium - Testis ✓ (1)

(b) Oögonia - Ovary ✓ (1)

4.4 Bar graph

4.4.1 Bar graph representing butterfat and crude fibre percentage from week 5–25 of lactation



CRITERIA/RUBRIC/MARKING GUIDELINES

- Correct heading ✓
- X-axis: correct calibrations and labelled (Time) ✓
- Y-axis: correct calibrations and labelled (Butterfat and crude fibre) ✓
- Correct units (% and weeks) ✓
- Bar graph ✓
- Accuracy (80%+ correctly plotted) ✓ (6)

4.4.2 Deduction of the trend of crude fibre

Increases from 4,6 to 5,0 ✓ (1)

4.5 Development of the embryo in the uterus of a cow

4.5.1 Letters of parts

- (a) F ✓ (1)
- (b) B ✓ (1)
- (c) C ✓ (1)

4.5.2 TWO functions of the amniotic fluid

- Shock absorber/prevents injuries ✓
- Allow movement of the foetus ✓
- Regulates temperature of the foetus ✓
- Lubricates birth canal ✓
- Prevents dehydration/desiccation of foetus ✓

(Any 2) (2)

4.6 Milk production**4.6.1 Name of the milk produced during the first three days**

Colostrum/beestings ✓

(1)

4.6.2 TWO reasons for the importance of colostrum

- Antibodies increase disease resistance in calf ✓
- Calcium and Phosphorus required for strong bone development ✓
- Contain growth factors ✓
- Assists in the maturation of the alimentary canal ✓
- Richer in nutrients ✓
- Serves as a laxative ✓
- Higher in energy ✓

(Any 2) (2)

4.6.3 Term for highest milk production point

Peak period/peak production ✓

(1)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150