Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2021

AGRICULTURAL SCIENCES P1
MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 10 pages.

SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓		
	1.1.2	B ✓✓		
	1.1.3	C ✓✓		
	1.1.4	D ✓✓		
	1.1.5	A ✓✓		
	1.1.6	D ✓✓		
	1.1.7	B ✓✓		
	1.1.8	C ✓✓		
	1.1.9	D ✓✓		
	1.1.10	C ✓✓	(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	Biological value/BV ✓✓		
	1.3.2	Quarantine ✓✓		
	1.3.3	Cryptorchidism ✓✓		
	1.3.4	Impotence ✓✓		
	1.3.5	Freemartin ✓✓	(5 x 2)	(10)
1.4	1.4.1	Lipase ✓		
	1.4.2	Weaning ✓		
	1.4.3	Colostrum/beestings ✓		
	1.4.4	Ovum/egg cell ✓		
	1.4.5	Repeat breeder ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 Digestion in farm animals

2.1.1 Indication whether the teeth represent the lower or upper jaws
Lower jaw ✓ (1)

2.1.2 Naming the type of digestion done by the teeth
Physical ✓ (1)

2.1.3 Explaining the importance of teeth together with saliva in FARM ANIMAL 1
Teeth break down large food particles into smaller particles ✓
Saliva moistens, softens and bind the particles together to form a bolus ✓ (2)

2.1.4 Part of a fowl that performs the same function done by teeth
Ventriculus/gizzard ✓ (1)

2.1.5 Explanation of the path of milk in FARM ANIMAL 2
Milk flows from the mouth to the oesophogal groove ✓ and land directly into the abomasum ✓ (2)

2.2 Villi

2.2.1 Part in the alimentary canal where villi is found
Small intestines ✓ (1)

2.2.2 Indication of the nutrient absorbed in part A and B
Part A – Digested protein and carbohydrates ✓
Part B – Digested fats ✓ (2)

2.2.3 Process that follows after the absorption of nutrients
Assimilation ✓ (1)

2.2.4 ONE adaptation feature of the villi
- Presence of blood and lymph capillaries ✓
- Microvilli to increase the surface area for absorption ✓
- Thin layer of epithelial cells with carrier molecules ✓ (Any 1 x 1) (1)

2.3 Feed components

2.3.1 Identification of the feed suitable for:

(a) Young growing animals – Feed **C** ✓

(b) Fattening old ewes – Feed **A** ✓

(c) Insulation against temperature changes **–** Feed **B** ✓ (3)

2.3.2 Calculation of the nutritive ratio of feed B

$$NR = 1 : \frac{\%TDN -- \% DP}{\% DP} \checkmark$$

$$1 : \frac{85\% - 20\%}{20\%} \checkmark$$

1 : 3,25 ✓

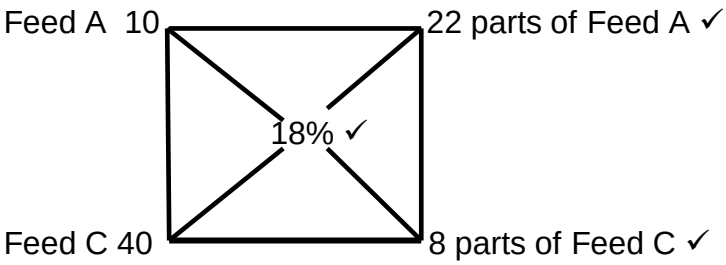
OR

$$NR = 1 : \frac{\% \text{ digestible non-nitrogen substances}}{\% \text{ digestible protein}} \checkmark$$

$$1 : \frac{65}{20} \checkmark$$

1 : 3,25 ✓ (3)

2.3.3 Determining the ratio of feed A and feed C to be mixed to get a feed with 18% DP



Ratio of feed **A** : Feed **C** is 22 : 8 ✓ (4)

2.4 Growth stimulants

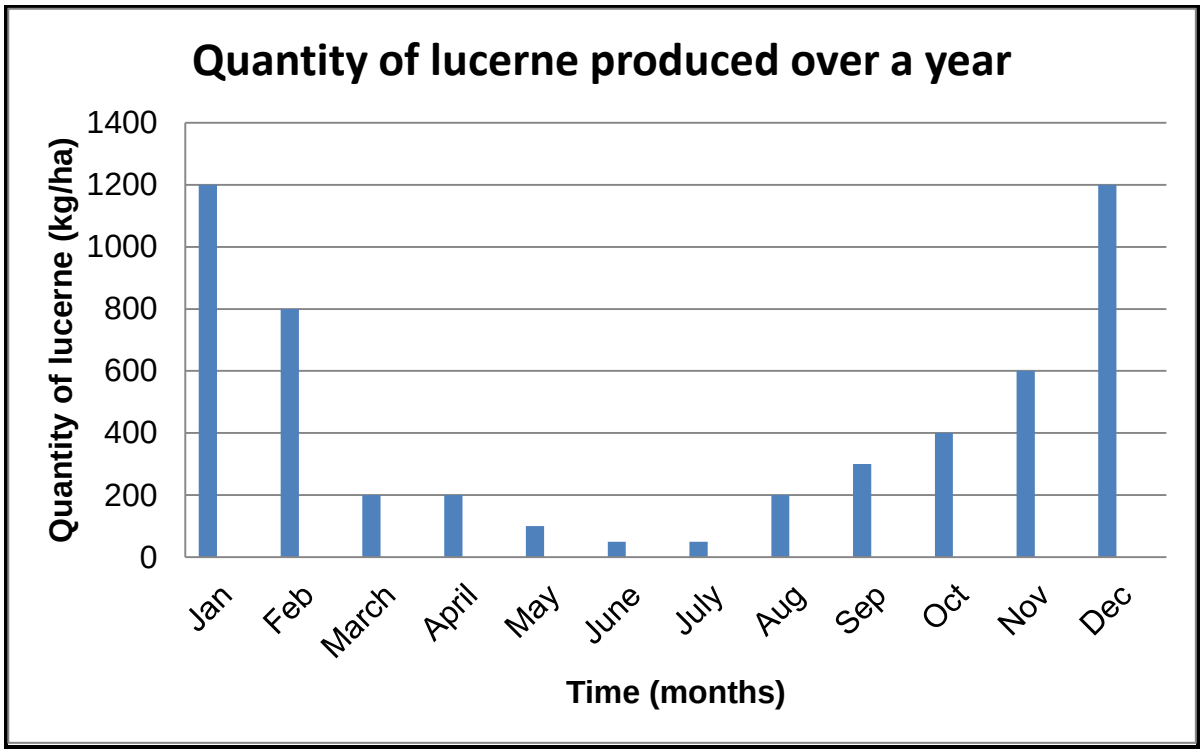
Naming the most applicable substance:

(a) Tranquilisers ✓

(b) Thyroid regulator ✓ (2)

2.5 **Fodder flow**

2.5.1 **Bar graph**



Criteria/rubric/marking guideline

- Correct heading ✓
- *x*-axis: Correctly calibrated and labelled (Time) ✓
- *y*-axis: Correctly calibrated and labelled (Quantity of lucerne) ✓
- Correct units (kg/ha and months) ✓
- Bar graph ✓
- Accuracy ✓ (6)

2.5.2 **Calculation of the total amount of lucerne the cows will need in June**

Number of animal x requirement/kg/day x 30
= 35 x 5 kg x 30 ✓
= 5 250 kg ✓ (2)

2.5.3 **Determination of whether there will be enough lucerne for these lactating cows in June**

Supply in June = 50 kg/Ha x 42 hectares
= 2 100 kg ✓
2 100kg – 5 250 kg – 3 150 kg ✓
There will be a shortage of 3 150 kg. ✓ (3)

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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Production system

3.1.1 Identification of the animal production system
Extensive production system ✓ (1)

3.1.2 TWO reasons
- Lot of space and few animals/low-density ✓
- Animal production adapted to existing environment/environment not modified ✓
- Low input costs ✓
- Use of thorny shrubs as fencing ✓ (Any 2 x 1) (2)

3.1.3 Linking the production system with a relevant farming system
Subsistence ✓ (1)

3.1.4 Identification of the measures to increase animal production under the following:

(a) **Nutrition** – Planting of the kikuyu ✓
(b) **Reproduction** – Breeding animals adapted to the environment ✓
(c) **General enterprise management** – Dividing grazing area into camps/practising rotational grazing ✓ (3)

3.2 Facilities/equipment

3.2.1 Identification of the facilities/equipment
PICTURE B – Furrowing crate ✓
PICTURE D – Drinker ✓ (2)

3.2.2 Purpose of using the facility
Labelled A in PICTURE C – to restrain an animal ✓ (1)

3.2.3 TWO design features of the facility labelled B in PICTURE C
- Should have high solid sides to prevent animals from seeing out ✓
- Narrow curved/not curved too sharply ✓ (2)

3.2.4 Indication of the information to be included in the permit
- Details of the owner ✓
- Number of animals ✓
- Type of animals ✓
- Description of animals ✓
- Registration number of the vehicle ✓
- Destination to which animals are being taken ✓
- Name and ID number of the driver ✓ (Any 2 x 1) (2)

3.3 Animal handling and behaviour

3.3.1 TWO signs of pigs in distress

- Tail biting ✓
- Ear biting ✓
- Cannibalism ✓
- Belly nibbling ✓
- Snout rubbing ✓ (Any 2 x 1) (2)

3.3.2 TWO effects of incorrect handling of animals during transportation

- Animals will be injured ✓
- Delayed rigor mortis ✓
- Poor quality of meat ✓ (Any 2 x 1) (2)

3.4 Diseases

3.4.1 TWO signs showing that the animal is sick

- Dull glossy eyes ✓
- Pink membrane around the eyes ✓
- Rapid pulse rate ✓
- Laboured breathing ✓
- Animal walks slowly or limps when forced to walk ✓
- Discoloured urine and faeces may be too hard or too soft ✓
- Dull rough coat ✓ (Any 2 x 1) (2)

3.4.2 TWO methods a farmer can use to test animal health

- Taking an animal's temperature ✓
- Determining pulse rate ✓
- Determining respiratory rate ✓ (Any 2 x 1) (2)

3.5 Life cycle of an anthrax

3.5.1 Indication of the pathogen

Bacteria ✓ (1)

3.5.2 TWO ways in which the disease can be transmitted

- Ingestion of the animal product ✓
- Inhalation ✓
- Cutaneous/through the skin ✓ (Any 2 x 1) (2)

3.5.3 Justification that the disease is zoonotic

It is transferred from the animals ✓ to human beings ✓ (2)

3.5.4 TWO steps the farmer can take to prevent further spread of the disease

- Burn or bury the carcasses of infected animals ✓
- Dispose all manure, bedding and other contaminated materials ✓
- Clean and disinfect stables, pens, milking parlours and all equipment ✓ (Any 2 x 1) (2)

3.6 **Ticks**

3.6.1 **Classification of the parasite**
External parasite ✓ (1)

3.6.2 **Reason**
They create an opening on the skin of an animal ✓ (1)

3.6.3 **Name of the tick belonging to the following class:**
(a) **Three-host tick** – Bont tick ✓
(b) **One-host tick** – Blue tick ✓ (2)

3.6.4 **TWO economic impacts of ticks for the farmer**
- Decreased production ✓
- Decreased income/profit ✓
- High cost of treatment ✓ (Any 2 x 1) (2)

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QUESTION 4: ANIMAL REPRODUCTION

4.1 Reproductive systems

4.1.1 Identify the letter

(a) B ✓ (1)
(b) I ✓ (1)
(c) G ✓ (1)
(d) Diagram A – C ✓
Diagram B – J ✓ (2)

4.1.2 Naming the inner and the middle membranes surrounding the foetus

Inner membrane – Amnion ✓
Middle membrane – Allantois ✓ (2)

4.1.3 Explanation of the role of the parts

Part A – Regulates the temperature of the testis for optimum sperm production ✓
Part F – Collects the ovum released during ovulation ✓ (2)

4.2 Reproductive processes

4.2.1 Identification of the processes

B – Fertilisation ✓
C – Pregnancy/gestation ✓ (2)

4.2.2 Indication of the first and the last stage of pregnancy

First stage– Ovum phase ✓
Last stage- Foetal stage ✓ (2)

4.2.3 Name of the process labelled A

Artificial Insemination/AI ✓ (1)

4.2.4 TWO economic benefits of artificial insemination for the farmer

- Less expensive because there is no need to buy a bull ✓
- Large number of offspring can be produced from the superior bulls ✓
- Semen of superior bulls can be used even after death ✓
- Semen of multiple sires can be used without maintaining many expensive bulls
- Higher conception rate is achieved ✓ (Any 2 x 1) (2)

4.2.5 TWO factors causing retention of placenta

- Deficiency of vitamin A ✓
- Sexually transmitted diseases ✓
- Infections/abortion ✓
- Exhaustion following difficult calving ✓
- Mineral deficiency ✓
- Hereditary defects ✓
- Over-conditioning of dry cows ✓ (Any 2 x 1) (2)

4.3 Cloning

4.3.1 Identification of the reproductive process
Cloning/nuclear transfer ✓ (1)

4.3.2 Explanation of a reason
Somatic cell from the donor is fused with a nucleated egg cell ✓ giving rise to an offspring that is genetically identical to the donor sheep ✓ (2)

4.3.3 Naming of the process
Enucleation ✓ (1)

4.3.4 Indication of the letter of the sheep
(a) D ✓
(b) A ✓
(c) B ✓ (3)

4.3.5 TWO aims of the cloning
- Produce large number of genetically identical animals ✓
- Produce offspring from high quality animals ✓
- Preserve and extend proven superior genetics ✓
- Achieve high quality meat and dairy products ✓
- Increase number of endangered species ✓ (Any 2 x 1) (2)

4.4 Udder and lactation

4.4.1 Identification of parts
A – Alveoli ✓
B – Lobe ✓
C – Teat ✓ (3)

4.4.2 Indication of the role of alveoli
It is where milk is formed ✓ (1)

4.4.3 Naming the stage in the lactation cycle between month 10 and the next calving period
Dry/rest period ✓ (1)

4.4.4 Importance of dry period for lactating cow
To give time for glandular tissue of the udder to recover ✓ and prepare for optimum milk production in the next lactation cycle ✓ (2)

4.4.5 Identification of the number of months' lactation period last
10 months ✓ (1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150