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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2023

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 11 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	C ✓✓	(10 x 2)	(20)
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	D ✓✓		
	1.1.5	A ✓✓		
	1.1.6	A ✓✓		
	1.1.7	B ✓✓		
	1.1.8	C ✓✓		
	1.1.9	D ✓✓		
	1.1.10	B ✓✓		
1.2	1.2.1	A only ✓✓	(5 x 2)	(10)
	1.2.2	B only ✓✓		
	1.2.3	B only ✓✓		
	1.2.4	None ✓✓		
	1.2.5	Both A and B ✓✓		
1.3	1.3.1	Amylase/ptyalin ✓✓	(5 x 2)	(10)
	1.3.2	Feedlot ✓✓		
	1.3.3	Artificial insemination/AI ✓✓		
	1.3.4	Repeat breeders ✓✓		
	1.3.5	Impotence ✓✓		
1.4	1.4.1	Net/NE ✓	(5 x 1)	(5)
	1.4.2	Biological ✓		
	1.4.3	Acrosome ✓		
	1.4.4	Anoestrus ✓		
	1.4.5	Dry/rest ✓		

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 The compound stomach of a sheep****2.1.1 The letter of the part where**

- (a) **Microbial fermentation** - B/C ✓ (1)
- (b) **Mechanical digestion** - A/F ✓ (1)
- (c) **Chemical digestion** - E/D ✓ (1)

2.1.2 ONE function of small intestines

- Absorption of the digested food/nutrients ✓
- Secretion of digestive juices to break down larger molecules ✓
- Assist in mixing food with digestive juices ✓
- Undigested/unabsorbed contents pass through to the large intestine ✓ (Any 1) (1)

2.1.3 Comparing the oesophagus of sheep to that of a fowl

- In sheep the oesophagus has no enlargement/crop ✓ but in fowls the oesophagus has an enlargement/crop ✓
- In sheep the oesophagus is wide/long ✓ in fowls the oesophagus is narrow/short ✓ (Any 1) (2)

2.2 The biological value of feeds**2.2.1 Collective name of the amino acids**

Essential amino acids ✓ (1)

2.2.2 Explanation why protein quality is less important for ruminants

Micro-organisms are able to utilize amino acids ✓ to synthesize microbial protein that has a higher biological value ✓ (2)

2.3 Coefficient of digestibility**Calculation of digestibility co-efficiency**

$$\text{DM manure} = \frac{81}{100} \times 7 \text{ kg} = 5,67 \text{ kg} \checkmark$$

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

$$= \frac{24 \text{ kg} - 5,67 \text{ kg}}{24 \text{ kg}} \times 100 \checkmark$$

$$= 76,38 \checkmark \% \checkmark \quad (5)$$

2.4 Components of feed**2.4.1 Labelling of****A** - Inorganic components ✓

(1)

C - Carbohydrates ✓

(1)

2.4.2 TWO functions of water

- An important solvent ✓
- Helps during mechanical digestion/moistens food ✓
- Prevents constipation ✓
- Transportation of nutrients ✓
- Eliminates waste products ✓
- Part of biochemical reactions/homeostasis ✓
- Acts as lubricant ✓
- Regulates body temperature/cooling system ✓
- Supplies turgor pressure in cells/provides tensile strength/form/shape to cells ✓
- Major component of cells/blood/body tissue ✓
- Protects sensitive tissues in the body/shock absorbing fluid ✓
- For efficient milk production ✓

(Any 2) (2)

2.4.3 Letter representing protein**B** ✓

(1)

2.5 Pearson square**2.5.1 Parts representing****(a)** Soya bean oilcake meal - 6 ✓

(1)

(b) Oat meal - 29 ✓

(1)

2.5.2 Calculation of the percentage oat meal in the mixture

- $29+6 = 35$ parts ✓
- $\frac{29}{35} \times \frac{100}{1}$ ✓
- $= 82,86\%$ ✓

(3)

2.6 Fodder flow programme**2.6.1 Calculation of the quantity of feed required for the first six months of the year (in kg)**

- $50+50+50+50+55+60 = 315$ tons ✓
- $315 \times 1\,000$ ✓
- $= 315\,000$ kg ✓

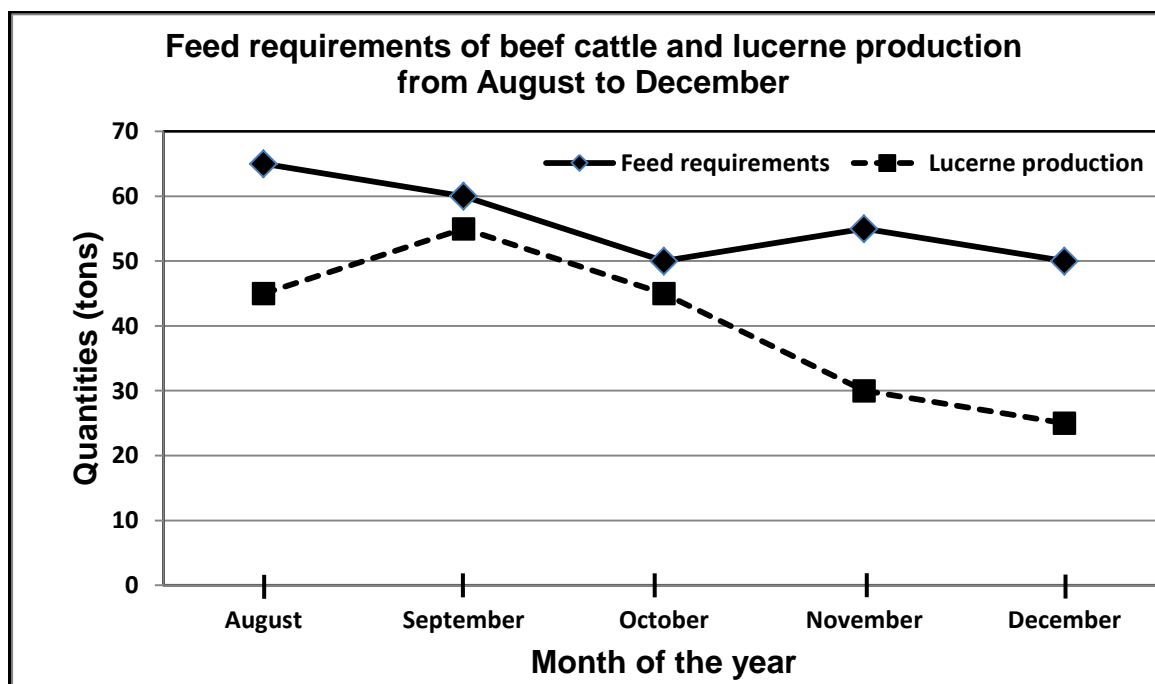
(3)

2.6.2 TWO importance of fodder flow planning

- Safe use of resources ✓
- To meet the animals feed requirements/standards ✓
- Effective management of the fodder flow programme ✓
- To ensure a positive margin over feed costs ✓

(Any 2) (2)

2.6.3 Line graph

**CRITERIA/RUBRIC/MARKING GUIDELINES**

- Correct heading ✓
- X-axis: correct calibrations and labelled (Month of the year) ✓
- Y-axis: correct calibrations and labelled (Quantities) ✓
- Correct unit (tons) ✓
- Line graph ✓
- Accuracy (80% + correctly plotted) ✓

(6)
[35]

QUESTION 3 : ANIMAL PRODUCTION, PROTECTION AND CONTROL**3.1 Production systems in pigs****3.1.1 Identification of**

- (a) Intensive production system ✓ (1)
 (b) Free range system ✓ (1)

3.1.2 The facility visible in picture A

Farrowing pen/crate ✓ (1)

3.1.3 ONE reason for housing pigs in a farrowing pen

- Separates sows and piglets/prevents cannibalism ✓
- Prevents sows from rolling over/lying down on piglets ✓
- Easy management/handling of animals ✓ (Any 1) (1)

3.1.4 TWO factors to increase animal production in a farrowing pen

- Environment/housing/sheltering ✓
- Nutrition/feeding ✓
- Management ✓
- Breeding/reproduction ✓ (Any 2) (2)

3.2 Farm animal behaviour

3.2.1 E ✓ (1)

3.2.2 C ✓ (1)

3.2.3 D ✓ (1)

3.2.4 A ✓ (1)

3.2.5 B ✓ (1)

3.3 Facilities used in animal production system**3.3.1 Identification of the facilities**

- A - Crush/chute ✓ (1)
 B - Head gate/neck clamp ✓ (1)

3.3.2 The purpose for using a herd gate

Restraining farm animals ✓ (1)

3.3.3 TWO reasons for handling farm animals

- Management practices/
docking/castration/AI/identification/dehorning/branding ✓
- For diagnosis purposes ✓
- Application of medication/treatment of parasites ✓
- Transportation ✓
- Generation of data ✓
- Determining the age of the animal ✓
- For pregnancy testing ✓ (Any 2) (2)

3.4 TWO basic requirements for transporting farm animals

- Don't transport animals when the roads are busy ✓
- Transport animals of different ages/size/sex/species separately ✓
- Pregnant animals should not be transported ✓
- Floors should not be slippery ✓
- No sharp edges/angles on the truck ✓
- Facilities should be high and strong ✓
- Familiarize animals with the loading area ✓
- Don't feed animals less than 12 hours before loading/loading facilities ✓
- Red flag when transporting animals by road ✓
- Animals should not be rushed ✓
- Don't load animals too long before departure ✓
- Proper ventilation ✓
- Relevant legal documentation ✓

(Any 2) (2)

3.5 Viral diseases**3.5.1 Name of the disease**

Rift Valley Fever (RVF) ✓

(1)

3.5.2 Identification of examples**(a) Vector** - Mosquito ✓

(1)

(b) Pathogen - Virus ✓

(1)

3.5.3 Justification

The disease is highly transmittable/infectious/contagious ✓

(1)

3.5.4 The term describing the sentence

Zoonotic ✓

(1)

3.5.5 TWO economic implications of animal diseases to the farmer

- Banning of exports and imports/decrease in trade ✓
- High treatment/vaccination costs to control/prevent diseases ✓
- Decreased production ✓
- Loss of livestock/death ✓
- Loss of income/profit ✓

(Any 2) (2)

3.6 Lifecycle of a parasite**3.6.1 Life cycle of a parasite**

Two-host ✓

(1)

3.6.2 Reason

It needs two hosts to complete its lifecycle ✓

(1)

3.6.3 THREE stages in the life cycle of the parasite

- Adult ✓
- Eggs ✓
- Larvae ✓
- Nymph ✓

(Any 3) (3)

3.7 Linking statements to internal parasites

- (a)** Liver fluke ✓ (1)
- (b)** Round worm ✓ (1)
- (c)** Tape worm ✓ (1)

3.8 TWO basic principles of good health

- Good sanitation/hygiene ✓
- Practice rotational grazing to control parasites at their breeding areas ✓
- Proper handling of manure ✓
- Isolation of sick animals from healthy ones ✓
- Vaccination ✓
- Veld burning ✓
- Proper feeding ✓

(Any 2) (2)
[35]

QUESTION 4: ANIMAL REPRODUCTION**4.1 Male and female reproductive organs****4.1.1 Labels**

- B** - Vas deferens/sperm duct ✓ (1)
C - Epididymis ✓ (1)
G - Cervix ✓ (1)

4.1.2 Letters

- (a)** D ✓ (1)
(b) E ✓ (1)
(c) I ✓ (1)
(d) A ✓ (1)

4.2 Reproductive process**4.2.1 The reproductive process**

- Mating/copulation ✓ (1)

4.2.2 Stage of the process

- Mounting ✓ (1)

4.2.3 TWO sexual behavioural signs displayed by bulls before mating

- Follow/excited about the cow on oestrus closely ✓
- Smelling/licking external genitalia and urine of the cow ✓
- Extend their heads and curl upper lips/Flehmen response ✓
- Pawing on the ground and snorting ✓
- Resting the chin on the cow's rump ✓
- Bellowing and tongue lapping ✓
- Protect/guard the females on oestrus ✓ (Any 2) (2)

4.2.4 TWO factors that regulate mating behaviour among bulls

- Genetics ✓
- Hormonal influences ✓
- Senses ✓
- Environmental factors ✓
- Psychological factors/temperament ✓
- Health status of the bull ✓
- Experience of the bull ✓
- The type of breed ✓
- Social ranking of the bull/over worked/exhausted ✓
- Newly introduced bulls in a herd attracts greater attention ✓
- Social and sexual interactions/over worked/exhaustion ✓
- Feeding ✓ (Any 2) (2)

4.3 Cloning**4.3.1 Type of cloning****A - Reproductive cloning** ✓ (1)**B - Therapeutic cloning** ✓ (1)**4.3.2 Purpose of****A - Reproductive cloning** - To produce an offspring that is genetically identical to the donor ✓ (1)**B - Therapeutic cloning** - To produce stem cells that can be used for health purposes/cell therapy ✓ (1)**4.3.3 TWO disadvantages of cloning**

- It is expensive ✓
 - Requires specific skills/expert knowledge ✓
 - Cloned animals age prematurely/limited capacity to survive ✓
 - There is an increased incidence of abnormalities ✓
 - Dystocia problems due to large offspring ✓
 - Genetic diversity deteriorates ✓
- (Any 2) (2)

4.4 Gametogenesis**4.4.1 The processes****DIAGRAM 1 - Spermatogenesis** ✓ (1)**DIAGRAM 2 - Oogenesis/ovogenesis** ✓ (1)**4.4.2 Labelling****A - Secondary spermatocyte** ✓ (1)**B - Sperm cells/spermatozoa** ✓ (1)**C - Primary oocyte** ✓ (1)**4.4.3 The type of cell division**

Mitosis ✓ (1)

4.5 Parturition**4.5.1 The term referring to birth difficulty in cows**

Dystocia ✓ (1)

4.5.2 TWO problems associated with the foetus that interfere with normal parturition

- High birth weight/large foetus/hydro foetus ✓
 - Incorrect presentation ✓
 - Flexion of the elbow ✓
 - Deviation of the head ✓
 - Retention of one or both legs ✓
 - Hydrocephalus ✓
 - Deformities/congenital defects ✓
 - Multiple births/twinning ✓
 - Dead foetus ✓
- (Any 2) (2)

4.5.3 TWO factors causing retention of the placenta

- Deficiency of vitamin A ✓
- Infection/abortion ✓
- Mineral deficiency/lack of Se/Mg/Ca ✓
- Premature birth ✓
- Hereditary defects/breed type ✓
- Inertia of the uterus causing weak contractions to expel placenta ✓
- Over-conditioning of dry cows ✓
- Metabolic disorders/milk fever ✓
- Malnutrition ✓
- Old age ✓
- Prolonged labour ✓
- Vaginal prolapse ✓
- Diseases ✓
- Induced calving ✓
- Multiple births/twinning/abnormal births ✓

(Any 2) (2)

4.6 The udder of a cow**4.6.1 Identification of the parts****A** - Alveoli/lobule ✓

(1)

B - Gland cavity ✓

(1)

4.6.2 The letter of the part where milk is produced**A** ✓

(1)

4.6.3 Hormone**(a) Synthesis of milk** - Prolactin/luteotropic hormone/LTH ✓

(1)

(b) Milk let down process - Oxytocin/ ✓

(1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150