education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 12

AGRICULTURAL SCIENCES

JUNE 2024

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages and the cognitive grid.

SECTION A

QUESTION 1:

1.1

1.1.1 A ✓✓
1.1.2 C ✓✓
1.1.3 C ✓✓
1.1.4 B ✓✓
1.1.5 C ✓✓
1.1.6 A ✓✓
1.1.7 D ✓✓
1.1.8 D ✓✓
1.1.9 B ✓✓
1.1.10 D ✓✓ (10 x 2) (20)

1.2

1.2.1 B Only ✓✓
1.2.2 A Only ✓✓
1.2.3 None ✓✓
1.2.4 Both A and B ✓✓
1.2.5 A Only ✓✓ (5 x 2) (10)

1.3

1.3.1 Bolus/cud ✓✓
1.3.2 Broilers ✓✓
1.3.3 Vas Deferens/Sperm duct ✓✓
1.3.4 Ejaculation ✓✓
1.3.5 Pedometer ✓✓ (5 x 2) (10)

1.4

1.4.1 Amylase ✓
1.4.2 Milking shed/stall/parlour ✓
1.4.3 Amnion ✓
1.4.4 Dystocia ✓
1.4.5 Therapeutic ✓ (5 x 1) (5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 Alimentary canal of a farm animal

2.1.1 Classification of farm animals

DIAGRAM A - Non-ruminant ✓ (1)
DIAGRAM C - Ruminant ✓ (1)

2.1.2 Reason for each classification

DIAGRAM A - It has a simple stomach/ventriculus/proventriculus ✓ (1)
DIAGRAM C - It has a complex/compound stomach ✓ (1)

2.1.3 The age group of the animal in DIAGRAM C

Young ruminant/calf/3 months or younger ✓ (1)

2.1.4 ONE reason visible for the age

- Presence of oesophageal groove ✓
- Underdeveloped rumen/reticulum/omasum/forestomachs ✓
- Very large abomasum ✓ (Any 1) (1)

2.1.5 Identification of the LETTER where pepsin is secreted

DIAGRAM A - B ✓ (1)
DIAGRAM C - E ✓ (1)

2.2 Indication of animal feeds

(a) Oilcake meal ✓ (1)
(b) Maize meal ✓ (1)
(c) Dried hay ✓ (1)
(d) Green Lucerne ✓ (1)

2.3 Feed composition

2.3.1 Classification of feeds

Feed **A -** Concentrate ✓ (1)
Feed **B -** Roughage ✓ (1)

2.3.2 **Calculation of the nutritive ratio of FEED A**

Calculation of DNNN = TDN (12,5 + 6,0 + 60 + 1,5 = 80%)
80 – 12,5 = 67,5% ✓

Nutritive Ratio = 1 : $\frac{\text{\% digestible non-nitrogen nutrients}}{\text{\% digestible protein}}$ ✓

1 : $\frac{67,5\%}{12,5\%}$ ✓

1 : 5,4 ✓

OR

Calculation of DNNN = TDN (12,5 + 6,0 + 60 + 1,5 = 80%) ✓

Nutritive Ratio = 1 : $\frac{\text{TDN\% – DP\%}}{\text{DP\%}}$ ✓

1 : $\frac{80\% - 12,5\%}{12,5\%}$ ✓

1 : 5,4 ✓ (4)

2.3.3 **A purpose for feed**
- Growth ✓
- Production ✓
- Reproduction ✓
- Work ✓ (Any 1) (1)

2.3.4 **Justify**
NR is narrow/< 1:6/more protein for growth ✓ (1)

2.4 **Process in the alimentary canal**

2.4.1 **Identification of the process**
Absorption of food ✓ (1)

2.4.2 **The part where absorption occurs**
Small intestine ✓ (1)

2.4.3 **Identification of the type of nutrient transport**
A - Passive transport ✓ (1)
B - Active absorption ✓ (1)

2.4.4 **Reason for the type of transport**
A/Active transport - Nutrients move against concentration gradient/ from a low to a high concentration ✓ (1)
B/Passive absorption - Nutrients move along concentration gradient/ from a high to a low concentration ✓ (1)

2.4.5 **The nutrient absorbed**

(a) Blood capillaries

- Digested protein ✓
- Carbohydrates ✓
- Amino acids ✓
- Glucose ✓
- Vitamins ✓
- Minerals ✓ (Any 1) (1)

(b) Lacteal

- Digested fats ✓
- Glycerol and fatty acids ✓ (Any 1) (1)

2.5 **Feed flow programme**

2.5.1 **Identification of the month for reducing animals**

June ✓ (1)

2.5.2 **Reason**

Supplementary requirement for the animal daily is higher than other months ✓ (1)

2.5.3 **TWO sustainable actions**

- Cutting fodder during the rainy season/making hay ✓
- Storage of fodder for the dry season ✓
- Stock reduction ✓ (Any 2) (2)

2.5.4 **Calculation of feed available in tons during February**

800 kg/ha x 14 ha ✓

= $\frac{11\ 200\ kg}{1\ 000}$ ✓

= 11,2 tons ✓ (3)

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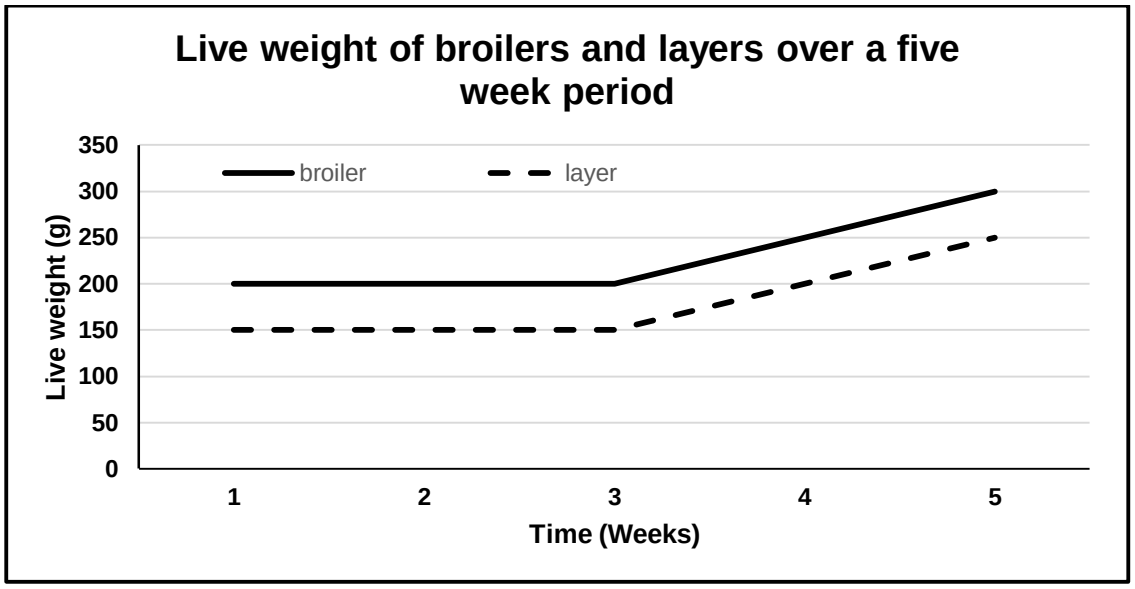
QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Graph on live weight over a period of 5 weeks

3.1.1 Deduction of the trend of live weight

As the weeks increase ✓ the live weight remains the same ✓ (2)

3.1.2 Line graph



CRITERIA/RUBRIC/MARKING GUIDELINE

- Correct heading (indicating both variables) ✓
- X - axis: Correctly calibrated and labelled (Weeks) ✓
- Y - axis: Correctly calibrated and labelled (Live weight) ✓
- Line graph ✓
- Correct units (g) ✓
- Accuracy (80% correctly plotted) ✓ (6)

3.2 Scenario on farming systems

3.2.1 Identification of the farming systems practised

Farmer A - Commercial farming ✓ (1)
Farmer B - Subsistence farming ✓ (1)

3.2.2 Justification

Farmer A - Produces on a large scale/sells the produce for profit ✓ (1)
Farmer B - Produce to sustain the family ✓ (1)

3.2.3 Farming system with the highest negative impact to the environmental

Farming system with the highest negative impact to the environmental - Commercial farming ✓ (1)

3.2.4 **ONE environmental effect**
- Farmer **A** produces 1 220 tons of manure per year ✓
- Produce methane gass as a by-product of ruminant digestion ✓

(Any 1) (1)

3.3 **Apparatus used for a management practice in sheep production**

3.3.1 **Identification of apparatus**
Elastrator ✓ (1)

3.3.2 **Function of apparatus with sheep**
Tail docking/castration ✓ (1)

3.3.3 **ONE reason why apparatus is preferred**
- Easy to use/fast ✓
- Cheap ✓
- Bloodless method ✓
- Hygienic method ✓ (Any 1) (1)

3.3.4 **Age group where it is performed**
Young as possible/before day 7 after birth ✓ (1)

3.3.5 **Justify**
- Animals are easier to handle/smaller ✓
- Less tissue damage/blood/animals recover quicker ✓
- Less stress on animals/personnel ✓ (Any 1) (1)

3.3.6 **ONE other apparatus that can be used**
- Knife/Scalpel ✓
- Burdizzo ✓
- Electrical hot knife/blade ✓ (Any 1) (1)

3.4 **Diseases in farm animals**

3.4.1 **Complete table**
A - Bacteria/Bacterium ✓ (1)
B - Cattle/Sheep/Goat ✓ (1)
C - Protozoa/Protozoan ✓ (1)
D - Lumpy wool ✓ (1)

3.4.2 **Disease affecting only dairy cows**
Mastitis ✓ (1)

3.4.3 **TWO management practices used to prevent red water**
- Inoculation/vaccination/immunisation ✓
- Dipping to control ticks ✓
- Move animals/veld management/rotational grazing/ burning of the veld ✓ (Any 2) (2)

3.4.4 **Farm animal susceptible to mastitis**
Lactating dairy cattle/cow/female animal ✓ (1)

3.5 **Poisonous plants**

3.5.1 **Common name for these plants**
Poisonous/toxic plants ✓ (1)

3.5.2 **Farm animal mainly affected by poison leaf**
Cattle ✓ (1)

3.5.3 **TWO other poisonous plants**
- Maize fungus ✓
- Thorn apple ✓
- Poisonous bulb ✓ (Any 2) (2)

3.5.4 **TWO types of sheep most susceptible for poisonous plants**
- Exotic breeds ✓
- Young animals/lambs ✓
- Old animals ✓
- Pregnant animals ✓ (Any 2) (2)

3.5.5 **Protein substitute for ruminants**
Urea ✓ (1)
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QUESTION 4: ANIMAL REPRODUCTION

4.1 **Reproductive systems**

4.1.1 **Identification of the letter**

(a) D ✓ (1)
(b) C ✓ (1)
(c) E ✓ (1)
(d) A ✓ (1)

4.1.2 **Congenital defect in males and females causing sterility**
Hypoplasia ✓ (1)

4.1.3 **TWO hormones responsible for ovulation**
- Luteinizing hormone ✓
- Oestrogen hormone ✓ (2)

4.2 **TWO senses regulating mating behaviour in bull**
- Smell ✓
- Sight ✓
- Touch/tactile ✓ (Any 2) (2)

4.3 Artificial Insemination

4.3.1 Chronological order of the steps during AI

- Semen harvesting ✓ (1)
- Semen examination ✓ (1)
- Semen dilution ✓ (1)
- Heat detention ✓ (1)
- Placing of semen into the reproductive tract of a cow ✓ (1)

4.3.2 TWO economic benefits of AI for the farmer

- More female animals can be fertilized by superior male animals ✓
- It is a quick and economic way of improving the herd ✓
- Commercial value of herd is improved ✓
- No need to buy a bull ✓
- Higher conception rate ✓ (Any 2) (2)

4.3.3 Other scientific technique to improve production rate

- Embryo flushing ✓
- Embryo transfer ✓ (Any 1) (1)

4.4 Cloning

4.4.1 Identification of the process

Cloning/Nuclear transfer ✓ (1)

4.4.2 Letter of the sheep that is identical to a cloned sheep

Sheep A ✓ (1)

4.4.3 Letter of the sheep that will be a surrogate

E ✓ (1)

4.4.4 The processes at C

Enucleation ✓ (1)

4.4.5 TWO aims of the cloning

- To produce large number of genetically identical animals ✓
- To produce offspring from high quality animals ✓
- To preserve superior genetics ✓
- To increase the number of endangered species ✓ (Any 2) (2)

4.5 Gestation stages

4.5.1 Identification of the process
Fertilisation ✓ (1)

4.5.2 The stage of pregnancy at A
Ovum stage ✓ (1)

4.5.3 The structure that develops to feed the calf at C
The udder ✓ (1)

4.5.4 TWO systems developing at B
- Respiratory system ✓
- Digestive system ✓
- Uro-genital and vascular system ✓
- Central nervous system ✓ (Any 2) (2)

4.5.5 TWO reasons for abortion
- Hormonal or metabolic abnormalities ✓
- Malnutrition ✓
- Trauma and injuries ✓
- Poisoning ✓
- Infections ✓
- Allergies and twinning ✓
- Genetic/chromosomal defects ✓ (Any 2) (2)

4.6 Parturition

4.6.1 The type of presentation
(a) Anterior presentation ✓ (1)
(b) Posterior presentation ✓ (1)

4.6.2 Presentation that will need veterinary assistance
Posterior presentation ✓ (1)

4.6.3 TWO problems causing difficult birth
- Deviation of head ✓
- Flection of the elbow ✓
- Retention of one or both forelegs ✓
- Congenital defects/deformities ✓
- Twins ✓ (Any 2) (2)

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TOTAL SECTION B: 105
GRAND TOTAL: 150