

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2019

**AGRICULTURAL SCIENCES P1
MARKING GUIDELINE**

MARKS: 150

The marking guidelines consists of 11 pages.

SECTION A**QUESTION 1**

- | | | | | |
|-----|--------|------------------------------|----------|------|
| 1.1 | 1.1.1 | B ✓✓ | | |
| | 1.1.2 | C ✓✓ | | |
| | 1.1.3 | B ✓✓ | | |
| | 1.1.4 | A ✓✓ | | |
| | 1.1.5 | D ✓✓ | | |
| | 1.1.6 | A ✓✓ | | |
| | 1.1.7 | B ✓✓ | | |
| | 1.1.8 | C ✓✓ | | |
| | 1.1.9 | C ✓✓ | | |
| | 1.1.10 | D ✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | B only ✓✓ | | |
| | 1.2.2 | Both A and B ✓✓ | | |
| | 1.2.3 | None ✓✓ | | |
| | 1.2.4 | A only ✓✓ | | |
| | 1.2.5 | B only ✓✓ | (5 x 2) | (10) |
| 1.3 | 1.3.1 | Biological Value/BV ✓✓ | | |
| | 1.3.2 | Drenching gun/Dosing gun ✓✓ | | |
| | 1.3.3 | Repeated Breeder Syndrome ✓✓ | | |
| | 1.3.4 | Prostate ✓✓ | | |
| | 1.3.5 | Hydrocephalus ✓✓ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | Maintenance ✓ | | |
| | 1.4.2 | Battery ✓ | | |
| | 1.4.3 | Super ovulation ✓ | | |
| | 1.4.4 | Acrosome ✓ | | |
| | 1.4.5 | Dry period ✓ | (5 x 1) | (5) |

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canals of farm animals****2.1.1 Classification of farm animals****Diagram 1** – Non-ruminant ✓**Diagram 3** – Ruminant ✓

(2)

2.1.2 Reason for each classification**Diagram 1** – It has a simple/monogastric stomach/ventriculus/proventriculus ✓**Diagram 3** – It has a complex/compound stomach ✓

(2)

2.1.3 Determination of the age of the animal in Diagram 3

Young ruminant/calf ✓

(1)

2.1.4 ONE feature visible for the age

- Presence of oesophagal groove ✓
- Underdeveloped rumen/reticulum/omasum ✓
- Well-developed abomasum ✓

(Any 1 x 1)

(1)

2.1.5 Justification of animals not digesting crude fibre**Diagram 2** – There are no rumen micro-organisms to digest crude fibre ✓**Diagram 3** – Rumen is still underdeveloped/not functioning ✓

(2)

2.1.6 Identification of the letter where rennin is secreted**Diagram 1** – B ✓**Diagram 3** – E ✓

(2)

2.2 Indication of animal feeds

- (a) Oilcake meal ✓
- (b) Maize meal ✓
- (c) Sun dried hay ✓
- (d) Green lucerne ✓

(1)

(1)

(1)

(1)

2.3 Feed composition**2.3.1 Classification of feeds****Feed A** – Concentrates ✓

(1)

Feed B – Roughage ✓

(1)

2.3.2 Reason for classification

Feed A Low percentage of crude fibre ✓
 High percentage of Total Digestible Nutrients/TDN ✓
 High percentage of protein ✓ (Any 1)

Feed B High percentage of crude fibre ✓
 Low percentage of Total Digestible Nutrients ✓
 Low percentage of protein ✓ (Any 1) (2)

2.3.3 Calculation of nutritive ratio of FEED A

Calculation of DNNE's = TDN (12,5 + 6 + 60 + 1,5 = 80%)

$$80 - 12,5 = 67,5\% \checkmark$$

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

$$1 : \frac{67,5}{12,5} \checkmark$$

$$1 : 5,4 \checkmark$$

OR

Calculation of DNNE's = TDN (12,5 + 6 + 60 + 1,5 = 80%) ✓

$$\text{Nutritive Ratio} = 1 : \frac{\text{TDN} - \text{DP}}{\text{DP}} \checkmark$$

$$1 : \frac{80 - 12,5}{12,5} \checkmark$$

$$1 : 5,4 \checkmark$$

(4)

2.3.4 Recommendation of FEED A

Recommended for growth purpose ✓ (1)

Reason

NR is narrow/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 Name of the part where absorption occurs

Small intestine ✓ (1)

2.4.3 Identification of the type of nutrient transport

A – Passive absorption ✓

B – Active transport ✓

(2)

2.4.4 Reason for the type of transport

A/Passive absorption – Nutrients move along concentration gradient ✓

B/Active transport – Nutrients move against concentration gradient ✓

(2)

2.5 Feed flow programme**2.5.1 Identification of the month for culling animals**

Month 6 ✓

(1)

2.5.2 Reason

- Feed available is the lowest ✓
- Supplementary requirement is the highest ✓

(Any 1 x 1) (1)

2.5.3 Calculation of feed available in tons during month 2

800 kg/ha x 14 ha ✓

$$\frac{11\,200\text{ kg}}{1\,000} \quad \checkmark$$

11,2 tons ✓

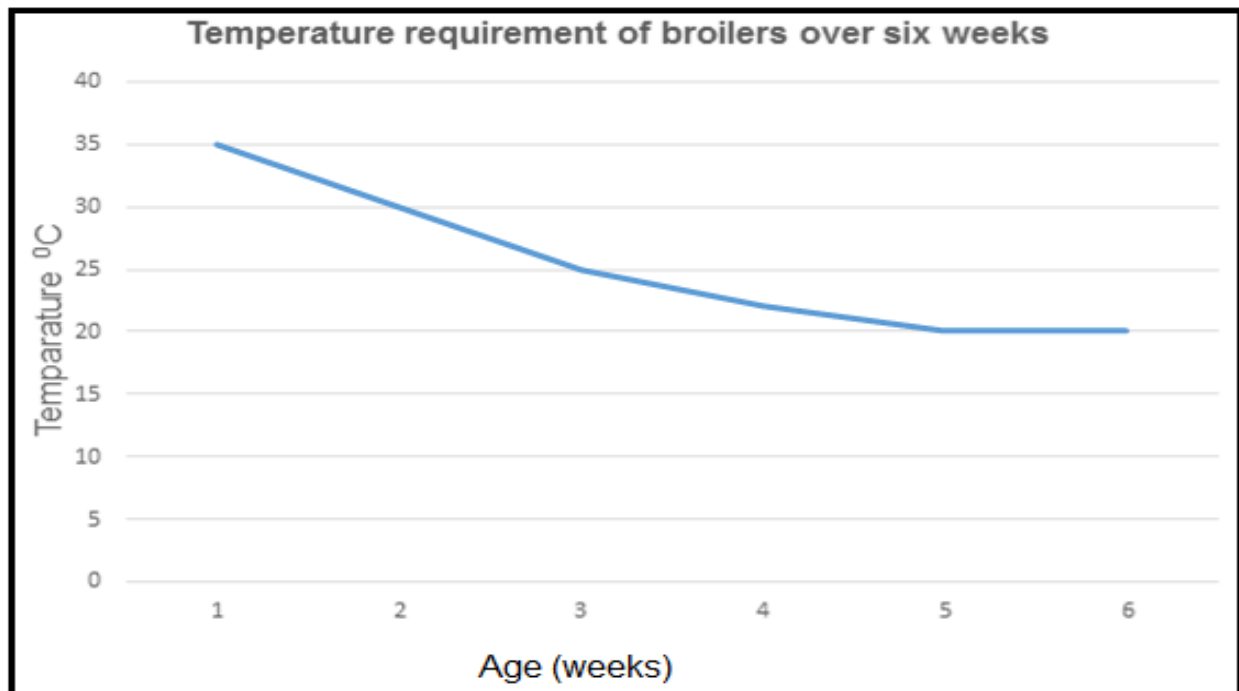
(3)

[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL**3.1 Graph on temperature requirement of broiler chickens****3.1.1 Deduction of the trend of temperature requirement**

- From week 1 to week 5 it decreases gradually ✓
- From week 5 to week 7 it is constant ✓

(2)

3.1.2 Line graph**Criteria/rubric/marketing guideline**

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Age) ✓
- Y-axis: Correctly calibrated and labelled (Temperature) ✓
- Line graph ✓
- Correct units (Weeks and °C) ✓
- Accuracy ✓

(6)

3.1.3 Equipment that can be used if temperature drops below 10 °C

Heaters/Infrared lights/Air conditioner ✓

(Any 1 x 1)

(1)

3.2 Bull under stress**3.2.1 THREE visible signs showing distress**

- Pawing ✓
- Raised hair ✓
- Snorting ✓
- Raised tail ✓
- Feigned charging movements ✓

(Any 3 x 1)

(3)

3.2.2 **Effect of the behaviour to handlers**
Injury ✓ (1)

3.2.3 **Equipment to calm the bull**
Electric prodder ✓ (1)

3.2.4 **THREE guidelines for handling large farm animals**

- Avoid yelling at animals ✓
- Do not approach animals from a blind spot ✓
- Move animals through a chute that has minimal obstructions ✓
- Never prod animals if they have no place to go ✓
- Announce your presence by touching it ✓

(Any 3 x 1) (3)

3.3 **Production unit/ system**

3.3.1 **Identification of the production system**
Intensive production system ✓ (1)

3.3.2 **Reason**
Presence of facilities ✓
Animals are kept in an enclosure ✓
High capital investment ✓ (Any 1) (1)

3.3.3 **Identification of the letter**
(a) C/D ✓
(b) B ✓
(c) D/C ✓ (3)

3.4 **FOOT-AND-MOUTH DISEASE/FMD**

3.4.1 **Naming the pathogen**
Virus ✓ (1)

3.4.2 **Extraction of a term from scenario meaning FMD can be transferred**
Contagious ✓ (1)

3.4.3 **Key symptom of FMD**
Blister-like lesions on the tongue/between the toes ✓ (1)

3.4.4 **TWO state actions from the scenario**

- Impose trade regulation ✓
- Veterinary services ✓
- Quarantine ✓

(Any 2 x 1) (2)

3.5 Parasites**3.5.1 Choosing the parasite**

- | | | |
|-----|---------------|-----|
| (a) | Nasal worm ✓ | (1) |
| (b) | Liver fluke ✓ | (1) |
| (c) | Bont tick ✓ | (1) |
| (d) | Tape worm ✓ | (1) |
| (e) | Blowfly ✓ | (1) |

3.6 THREE basic principles of good health

- Sanitation ✓
 - Controlling pests and parasites ✓
 - Proper handling of manure ✓
 - Isolation of sick animals ✓
 - Vaccination of animals ✓
 - Good management ✓
 - Ensure that feeds are not contaminated ✓
 - Waiting for a withdrawal period before using animal product ✓
 - Application of correct dosage of medication ✓
 - Burning carcass of infected animals ✓
- (Any 3 x 1) (3)
- [35]**

QUESTION 4: ANIMAL REPRODUCTION**4.1 Reproductive systems****4.1.1 Identification of the letter**

- (a) **Diagram 1 – A** ✓
Diagram 2 – D ✓ (2)
- (b) **C** ✓ (1)
- (c) **E** ✓ (1)
- (d) **A** ✓ (1)

4.1.2 Common congenital defect in bulls and cows 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/contact ✓ (Any 2) (2)

4.3 Artificial Insemination**4.3.1 Arrangement of the steps during AI chronologically**

- Semen harvesting ✓
- Semen examination ✓
- Semen dilution ✓
- Heat detention ✓
- Placing of semen into the reproductive tract of a cow ✓ (5)

4.3.2 TWO economic benefits of AI for the farmer

- More female animals can be fertilised 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 an expensive bull ✓
- Higher conception rate ✓ (Any 2 x 1) (2)

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 the cloned sheep

Sheep A ✓ (1)

4.4.3 Letter of a sheep that will be a surrogate

Sheep E ✓ (1)

4.4.4 Name of the processes in C

Enucleation ✓ (1)

4.4.5 TWO aims of 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 x 1) (2)

4.5 Gestation stages**4.5.1 Identification of the process**

Fertilisation ✓ (1)

4.5.2 Indication of the stage of pregnancy labelled A

Ovum stage ✓ (1)

4.5.3 Development that occurs at stage C

Rapid increase of the uterus ✓ (1)

4.5.4 TWO systems developing at stage B

- Respiratory system ✓
- Digestive system ✓
- Uro-genital and vascular system ✓
- Central nervous system ✓ (Any 2 x 1) (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 x 1) (2)

4.6 Parturition**4.6.1 Indication of the form 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 ✓
 - Flexion of the elbow ✓
 - Retention of one or both forelegs ✓
 - Congenital defects/deformities ✓
 - Twins ✓
- (Any 2 x 1) (2)
- [35]**

TOTAL SECTION B: 105

GRAND TOTAL: 150