

**GAUTENG DEPARTMENT OF EDUCATION
PREPARATORY EXAMINATION**

**AGRICULTURAL SCIENCES
(First Paper)**

POSSIBLE ANSWERS

SECTION A

QUESTION 1

- | | | | |
|--------|------------------|-------------------------|-------------|
| 1.1 | | | |
| 1.1.1 | D | | |
| 1.1.2 | C | | |
| 1.1.3 | A | | |
| 1.1.4 | B | | |
| 1.1.5 | D | | |
| 1.1.6 | A | | |
| 1.1.7 | B | | |
| 1.1.8 | D | | |
| 1.1.9 | C | | |
| 1.1.10 | A | | 2x10=(20) |
| | | | |
| 1.2 | | | |
| 1.2.1 | E - | Fishmeal | |
| 1.2.2 | G - | Sheep blowflies | |
| 1.2.3 | A - | Oestrus synchronization | |
| 1.2.4 | C - | Cellulose enzyme | |
| 1.2.5 | B - | Ventriculus | 2x5=(10) |
| | | | |
| 1.3 | | | |
| 1.3.1 | Hay | | |
| 1.3.2 | Duodenum | | |
| 1.3.3 | Metabolic energy | | |
| 1.3.4 | Oestrus | | |
| 1.3.5 | Idigenous | | 2x5=(10) |
| | | | |
| 1.4 | | | |
| 1.4.1 | A - | Avian flu | |
| | B - | Mastitis | |
| | C - | Lumpy wool | |
| | D - | Rabies | |
| | E - | Gall water | 1x5=(5) |
| | | | (45) |

TOTAL SECTION A: [45]

SECTION B**QUESTION 2****ANIMAL NUTRITION**

2.1

2.1.1

Digestive fluids and their origin

- Bile – liver
- Pancreatic juice – pancreas
- Succus entericus-walls of the small intestines (6)

2.1.2

Effects of the fluid produced by the liver

- Emulsifies fats
- Promotes fat absorption
- Assists in the absorption of fat-soluble vitamins (2)

2.1.3

Chemical digestion

- The action of enzymes and digestive juices, e.g. hydrochloric acid on food. (2)

Mechanical digestion

- The breaking-down of food through chewing and muscular action. (2)

2.2

2.2.1

The process of rumination

- A. Fine food particles pass into the omasum.
- B. Fluids and finer particles tend to pass into the reticulum continuously.
- C. Feed in the reticulo-rumen is mixed with the micro-organisms and saliva then returned into the mouth for chewing.
- D. Food is kept wet by contractions in the reticulo-rumen. (4)

2.2.2

Cellulose digestion

Summary of the role played by micro-organisms on cellulose.

- Cellulose, a complex carbohydrate (polysaccharide) found in the cell wall of plants, cannot be digested by the enzyme amylase;
- Bacteria secrete in the reticulo rumen, a cellulose enzyme;
- To digest cellulose into fatty acids (acetic, propionic and butyric acids) CO₂, methane, proteins and vitamin B-complex which are directly absorbed into the blood vessels. (4)

2.3

Gases that lead to bloating

- Methane
- CO₂ (2)

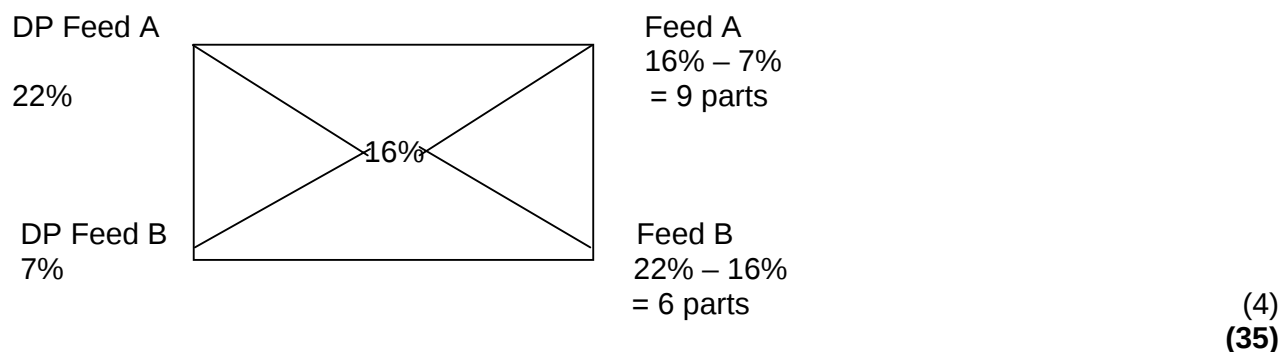
- 2.4 (a) A.
 (b) C.
 (c) B.
 (d) A. (4)

2.5 Carbohydrates through maize meal. (1)

2.6 **Recommendations**

- A. Lucerne cut and baled has high protein content and is highly digestible. (2)
 B. Chaff is easily digestible when urea (nitrogen) and molasses (carbohydrates) are added. (2)

2.7 **Calculation – Pearson square method**



QUESTION 3

ANIMAL PRODUCTION

3.1

3.1.1 **Increasing production**

- Laying a pipeline to obtain better quality water constantly
- Applying for electricity supply
- Starting a feedlot
- Upgrading animals (3)

3.1.2 **Construction of shelter**

- Build them shelter or provide shelter for them
- Provide ideal environmental conditions for animals so that they do not utilize their energy for keeping themselves warm
- Protection against wild animals
- Prevention of stock theft (4)

3.1.3 **Other reasons for providing shelter**

- Prevents unnecessary movement of animals, loss of heat when it is cold.
- Provides shade.
- Reduces the effect of extreme environmental conditions on production of farm animals. (2)

3.1.4 **Starting a feedlot**

- Reduces energy-loss by restricting the movement of animals and feed is directly delivered to them, thereby ensuring rapid growth. (2)

3.2

3.2.1 **Possible means of relieving labour shortage**

- Using trained dogs or horses
- Using motor cycles
- Construction of modern facilities (3)

3.2.2 **Farming operations/activities**

- Castration (1)

3.2.3 **Sheep not as tame**

- May not be used to being frequently handled, as a result, do not respond easily, e.g. extensive production
- Conducting several operations in one go might result in them responding in an untamed manner
- Incorrect handling
- It may also be due to handling them in a group situation
- When handled by more than one person
- Might be from a bloodline with a wild temperament (Two only) (2)

3.2.4 **Farming enterprise intensive or extensive**

Extensive

- Animals are not used to being handled
- There are not many labourers
- There are not many control measures (3)

3.3 **Incorrect handling of farm animals**

- Animals can kick, bite, behave unpredictably resulting in injury
- To prevent stampede which might lead to serious injury
- Leads to poor meat quality (rigor mortis)
- Lowered grading due to bruising and decreased production (4)

- 3.4 **List of manageable feed-flow points**
- The desired production feed-flow must match the required feed-flow
 - Allow livestock business to run smoothly throughout the year
 - Fits well in with other activities on the farm
 - Provide a reliable reserve of feed during expected and unexpected seasonal shortages
 - Will not allow impractical silage or haymaking at awkward times
 - Will have all the resources for producing feed
- (6)

3.5

3.5.1 **Cross-breeding**

The mating of two unrelated individual animals of the same breed from different breeding stock

(2)

3.5.2 **Reasons for the suggested breeds**

- The Dormer is a good meat breed
 - The Zebu cattle are well suited to extreme conditions
 - The Friesland produce large quantities of milk
- (3)

(35)**QUESTION 4**

4.1

4.1.1 **Main characteristics of oestrus**

- Pro-oestrus: – Development of the Graafian follicle
 - Oestrus: – Characteristics of oestrus visible
 - Ovulation
 - Met-oestrus: – Fertilization of the ovum
 - Development of corpus luteum
- (3)

4.1.2 **Hormones responsible for the characteristics**

- A. F.S.H. / Follicle-stimulating hormone
 - C. Progesterone
- (2)

4.2 **Three important aspects of artificial insemination**

- Observation of oestrus signs
 - Correct time for insemination
 - The technique itself
- (3)

4.3

4.3.1 **Effects of colostrum**

- Within the 1st eight weeks protection available from colostrum
 - Protection highest directly after birth, decreased gradually over time
- (2)

4.3.2 Reasons for few antibodies

- Due to the inability of the animal to form antibodies
- Availability of protection through colostrum (2)

4.3.3 Meaning of terms

A. **Colostrum:** The 1st milk rich in nutrients and antibodies produced by a female after giving birth for protection and nourishment of the young animal (2)

B. **Antibodies:** Chemical substances used inside the animal's body to protect it against disease-forming organisms (2)

4.3.4 Graphic interpretation

- The level of the antibodies decreased to a very low level at three weeks
- Then increased sharply from week 4
- At week 7 reached very high levels (2)

4.4

4.4.1 Life-cycle of a liver fluke

- Animal
- Liver fluke eggs released in faeces
- Eggs hatch and swim in water
- Worm penetrates water snail (4)

4.4.2 Indigenous treatment for the liver fluke

- Boiling chopped pieces of the bark from umga tree in water
- Administering 200 ml daily (2)

4.4.3 Effects of toxins

- Losses of production
- Death (2)

4.4.4 An organism that causes East Coast Fever

Midges (1)

4.5

4.5.1 **Equipment/medication used**

- (i) B
- (ii) C or E
- (iii) A or F
- (iv) A/E (4)

4.5.2 **The role of the State with regard to****A. Vaccines**

Established a veterinarian station at Onderstepoort that specialises in researching and making vaccines (2)

B. Control over livestock remedies

Livestock remedies controlled through legislation. Minister has the power to

- withdraw medication.
 - ensure that medication is reliable and controlled. (2)
- (35)**

TOTAL SECTION B: [105]

TOTAL: 150