



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**AGRICULTURAL SCIENCES P1**

**FEBRUARY/MARCH 2013**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 10 pages.**

**SECTION A****QUESTION 1.1**

|        |    |    |    |    |
|--------|----|----|----|----|
| 1.1.1  | A  | B  | ✓✓ | D  |
| 1.1.2  | A  | B  | C  | ✓✓ |
| 1.1.3  | A  | ✓✓ | C  | D  |
| 1.1.4  | ✓✓ | B  | C  | D  |
| 1.1.5  | A  | B  | ✓✓ | D  |
| 1.1.6  | A  | B  | ✓✓ | D  |
| 1.1.7  | ✓✓ | B  | C  | D  |
| 1.1.8  | A  | B  | C  | ✓✓ |
| 1.1.9  | A  | B  | ✓✓ | D  |
| 1.1.10 | A  | B  | C  | ✓✓ |

(10 x 2) (20)

**QUESTION 1.2**

|       |    |    |    |    |
|-------|----|----|----|----|
| 1.2.1 | A  | ✓✓ | C  | D  |
| 1.2.2 | ✓✓ | B  | C  | D  |
| 1.2.3 | ✓✓ | B  | C  | D  |
| 1.2.4 | A  | B  | C  | ✓✓ |
| 1.2.5 | A  | B  | ✓✓ | D  |

(5 x 2) (10)

**QUESTION 1.3**

|       |   |
|-------|---|
| 1.3.1 | Pancreas✓✓                                  |
| 1.3.2 | Anaemia✓✓                                   |
| 1.3.3 | Species crossing✓✓                          |
| 1.3.4 | Antibiotics✓✓                               |
| 1.3.5 | Lack of libido/lack of sex urge/impotence✓✓ |

(5 x 2) (10)

**QUESTION 1.4**

|       |                      |
|-------|----------------------|
| 1.4.1 | Oesophageal groove✓✓ |
| 1.4.2 | High✓✓               |
| 1.4.3 | Weaning✓✓            |
| 1.4.4 | Production ration✓✓  |
| 1.4.5 | Plunge dip✓✓         |

(5 x 1) (5)

**TOTAL SECTION A: 45**

**SECTION B**

**QUESTION 2: ANIMAL NUTRITION**

**2.1 Digestive system of non ruminants**

- 2.1.1 A – Liver✓  
B – Jejunum✓  
C – Colon✓  
D – Stomach✓  
E – Pancreas✓ (5)

2.1.2 Small intestines/duodenum✓ (1)

**2.1.3 The main structural difference of the small intestine**

|                                  | <b>Ruminant</b>                              | <b>Non-ruminant</b>  |
|----------------------------------|--|--|
| <b>Length of small intestine</b> | The length of the small intestine is longer✓ | The length of the small intestine is shorter✓<br><b>or</b> |
| <b>Absorption area</b>           | larger absorption area✓                      | smaller absorption area✓                                   |

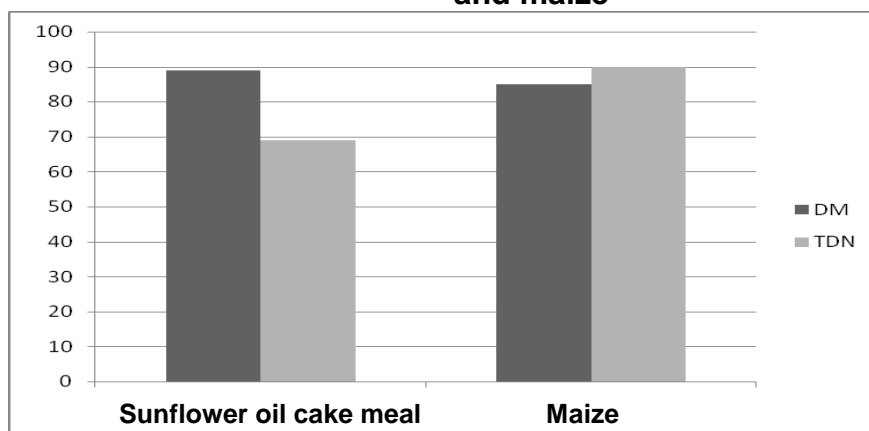
(2)

**2.1.4 Functions of bile**

- Emulsifies fats✓
- Changes the pH from acid to alkaline/neutralises acid from stomach✓
- Acts as an antiseptic/kills germs✓
- Promotes the absorption of fatty acids and glycerol✓
- Assists with the absorption of fat soluble vitamins✓ (Any 3) (3)

**2.2 Feeding programme**

**2.2.1 Comparison of the TDN and DM values for sunflower oil cake meal and maize**



**Marking the graph with the following checklist**

| Criteria                         | Yes: 1 Mark | No: 0 Mark |
|----------------------------------|-------------|------------|
| 1. Bar graph                     |             |            |
| 2. X axis labelled               |             |            |
| 3. Y values indicated            |             |            |
| 4. Values are plotted correctly  |             |            |
| 5. Correct heading               |             |            |
| 6. Units are indicated on Y axis |             |            |

(6)

**2.2.2 Sunflower oilcake meal:**

$$\text{NR} = 1 : \frac{69\% - 31\%}{31\%}\checkmark$$

$$1 : 1,2 \text{ or } 1:1\checkmark$$

**Maize:**

$$\text{NR} = 1 : \frac{90\% - 10\%}{10\%}\checkmark$$

$$1 : 8\checkmark$$

(4)

**2.2.3 Sunflower oilcake meal ✓****AND**

- Has a narrow NR ratio✓
- NR is less than 1:6 which is the norm for a narrow margin✓

**OR**

- Has more protein/high % of protein/high protein content✓
- In relation to carbohydrates and fats ✓

(3)

**2.3 Animal feeds****2.3.1 Classification of feeds**

(a) Silage

(b) Soya bean oil cake meal

(2)

**2.3.2 Suitability of a balanced ration**

- Ration has all the nutrients (concentrates and roughages) needed by the animal/balanced ration/supplements like minerals and vitamins are present✓
- All the requirements for the ration is supplied at once✓
- Micro organisms in the stomach get a uniform and balanced addition of nutrients during the ingestion process✓
- Save on labour as separate feedings are not needed✓
- Animals get a balanced ration which makes them to grow faster/more healthier✓

(Any 2) (2)

**2.3.3 Factors that determine water intake**

- Composition of feed/ration ✓
- Production status (milk production) ✓
- Temperature (climatic factors)/wind/humidity ✓
- Types/breeds of animals ✓
- Size of the animals ✓
- Location of feedlot (more radiation from the sun or less radiation from the sun) ✓
- Size of the feedlot-movement area of animals ✓ (Any 3) (3)

**2.3.4 Importance of vitamins**

- (a) Vitamin A
- Necessary for healthy bones ✓
  - Provides resistance to bacterial infections ✓
  - Necessary for normal reproduction ✓
  - Maintains healthy epithelial tissue and mucous membranes ✓
  - Ensures good vision ✓ (Any 2)
- (b) Vitamin D
- Helps with the absorption of calcium and phosphorus ✓
  - Ensures healthy teeth and bones ✓
  - Ensures good growth ✓ (Any 2) (4)
- [35]**

**QUESTION 3: ANIMAL PRODUCTION****3.1 Animal productivity****3.1.1 TWO adverse environmental conditions**

- Excessively hot conditions ✓
- Excessively cold conditions ✓ (2)

**3.1.2 Factors that influence the animal's ability for production potential**

- Nutrition ✓
- Diseases/Parasites ✓
- Genetic make-up/Breeding ✓
- Environment/Temperature ✓
- Management ✓
- Shelter ✓ (Any 3) (3)

**3.1.3 The economic impact of adverse conditions for the livestock farmer**

- Extra feeding to livestock/output not proportional to input ✓
- More money spent on inputs which makes the profit to be less ✓
- or**
- Loss of production ✓
- Smaller income for the farmer and profit is less ✓ (2)

- 3.1.4 **TWO measures to address the adverse environmental conditions**
- The farmer can provide housing/shelter to protect the animals✓
  - Provide more feed✓
  - Utilise environmental control measures like heaters/sprayers/misters✓ (Any 2) (2)
- 3.1.5 (a) **TWO reasons for the observation on very hot days**
- Very hot day animals felt very uncomfortable / less energetic✓
  - Had to breath faster✓
  - Had a loss in appetite / ingested less food✓
  - Temperatures are above the optimum for production✓ (Any 2) (2)
- 3.1.5 (b) **TWO reasons for the observation on very cold days**
- On cold days more heat was lost from the animal body✓
  - And more digested feed had to be burnt to compensate for the loss of heat✓
  - Which was also lost for production/nutrients was not utilized for production✓
  - Temperatures are below the optimum for production✓ (Any 2) (2)
- 3.2 **Animal behaviour**
- 3.2.1 **THREE reasons for handling sheep**
- For shearing✓
  - For catching/ transporting/loading✓
  - For foot toning/soaking/conditioning✓
  - For dipping✓
  - For deworming✓
  - For ear tagging✓ (Any 3) (3)
- 3.2.2 **TWO basic design features of the sheep handling facility**
- Not as strong material compared to that of cattle✓
  - Mobile/not permanent/temporary/can be moved✓
  - Not very high sides/fences/gates✓
  - Solid sides to make handlers less visible/easier movement✓
  - Chute included to prevent movement of animals✓
  - Cutting/sorting gate visible to group animals✓ (Any 2) (2)
- 3.2.3 **Handling animals with newly born**
- Avoid getting between an animal with its young✓
  - Carry out all treatment on new born in an area isolated from the mother✓
  - Let the newly born stay as close as possible to the parent ✓
  - Always be aware of the position of the parent ✓ (Any 2) (2)

**3.2.4 Sheep has a higher risk of stock theft**

- Sheep normally flock together which makes them easier to find✓
- Flocking makes sheep easier to catch✓
- Sheep are smaller animals and one handler can carry/tie a sheep✓
- It is easy to move them into a corner and use your arms or a portable gate to form a visual barrier ✓
- When the head of the sheep is covered it will lie still✓ (Any 2) (2)

**3.3 Handling large animals**

3.3.1 A – Rope✓  
B – Nose holder✓ (2)

3.3.2 Handled to make it to lie down/bring the animal down✓ (1)

3.3.3 • nostril ✓  
• ear ✓ (Any 1) (1)

**3.4 Milk production**

3.4.1 Lactation curve✓ (1)

3.4.2 (a) 44 weeks✓ (1)  
(b) 0 weeks/8 weeks after she was dried up✓ (1)  
(c) 4 weeks✓ (1)  
(d) 4 weeks✓ (1)  
(e) 16 weeks✓ (1)

**3.4.3 Factors determining peak period**

- Type of breed✓
- Age of the animal✓
- Nutrition✓
- Health condition✓
- Type of system/Housing/shelter/environmental control✓
- Environmental conditions✓ (Any 3) (3)

**[35]****QUESTION 4: ANIMAL REPRODUCTION, PROTECTION AND CONTROL****4.1 Structure of fallopian tube and uterus**

- 4.1.1 1. Ovulation✓  
2. Fertilisation✓  
3. Mitosis/cell division✓ (3)

**4.1.2 Function of amniotic fluid**

- Protects the embryo from shocks✓
- Suspends the embryo✓
- Prevent the embryo from drying out✓
- Make calving easier/lubricates the birth canal during calving✓

(Any 2) (2)

**4.1.3 Function of structure B**

- Passage for oxygen and nutrients✓
- from the maternal blood✓
- or
- Passage for waste products✓
- from the embryo✓

(2)

**4.1.4 Luteinising hormone(LH)✓**

(1)

**4.1.5 Adaptation of part F**

- Contains an acrosome with the enzyme✓
- Enzyme can dissolve the embryo wall✓
- Facilitates egg cell penetration as it moves forward/head part✓

(Any 2) (2)

**4.2 Artificial insemination****4.2.1 Characteristics of good semen**

- opaque✓
- milky/Normal colour ✓
- sticky✓
- less than 15% dead sperm cells✓
- no deformed sperm✓
- no blood in sperm✓

(Any 4) (4)

**4.2.2 The treatment of the frozen semen**

- Frozen semen is thawed/straws placed in water✓
- At between 32°C and 35°C✓

(2)

**4.2.3 Best time of inseminating**

- 12 hours after the first signs of oestrus✓
- in the morning when signs of oestrus were detected in the afternoon and vice versa✓

(Any 1) (1)

**4.2.4 The negative effect on the cow if the inseminator is not well trained**

- The inseminated cow might sustain injuries✓
- And the reproductive life of the cow shortened✓
- Pain and stress could be experienced✓

(Any 2) (2)



### 4.3 Male reproductive system

#### 4.3.1 Identification of labelled parts of the male reproductive system

A - Vesicular gland/seminal vesicles✓

B - Penis✓

D - Testicles/testes✓

(3)

#### 4.3.2 Function of part labelled A

Secretes a sticky yellowish fluid/seminal fluid✓

(1)

#### 4.3.3 Function of hormone secreted in part labelled D

- Responsible for male characteristics✓
- Stimulates the process of sperm formation/spermatogenesis✓

(1)

#### 4.3.4 Reason for suspension of part labelled D

- To regulate the temperature of the sperm cells/sperm formation /spermatogenesis ✓
- which requires a temperature slightly lower than the body temperature✓
- More airflow is possible over the structure that will cool it down during warm weather conditions✓

(Any 2)

(2)

### 4.4 Life cycle of roundworms

#### 4.4.1 Symptoms of roundworm infestations

- Mouth and eyes are pale✓
- Watery swelling may develop beneath the jaw✓
- Animals are weak and breathe quickly if they run✓
- The condition/production of the animal is weak/low ✓
- Larvae visible in manure/grass blades of pastures ✓

(Any 2)

(2)

#### 4.4.2 Methods to control roundworms at different stages

- Rest an area of veld✓ so that worm larvae and eggs die/rotation✓
- Burn the veld✓ to kill larvae and eggs✓
- Clean the kraal✓regular removal of manure✓
- Dose the animal✓ to control worms in the animal body✓

(Any 2)

(4)

**4.4.3 Importance of using registered remedies**

- They are specific and only controls specific parasites✓
- Chemicals have been tested in experimental trials to ensure the safety of animals✓
- Use the correct dosage to ensure that parasites do not become resistant✓
- Registered remedies are effective and have been tested✓
- Registered remedies will not affect the animal product if used correctly✓
- Overdosing may lead to a wastage of the chemical which is expensive✓

(Any 3)

(3)  
**[35]****TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**