



# basic education

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

## **SENIOR CERTIFICATE EXAMINATIONS**

**AGRICULTURAL SCIENCES P1**

**2016**

**MEMORANDUM**

**MARKS: 150**

**This memorandum consists of 10 pages.**

**SECTION A****QUESTION 1**

1.1	1.1.1	B ✓✓	(10 x 2)	(20)
	1.1.2	A ✓✓		
	1.1.3	A/B/C/D ✓✓		
	1.1.4	D ✓✓		
	1.1.5	B ✓✓		
	1.1.6	B ✓✓		
	1.1.7	A ✓✓		
	1.1.8	C ✓✓		
	1.1.9	A ✓✓		
	1.1.10	D ✓✓		
1.2	1.2.1	B only ✓✓	(5 x 2)	(10)
	1.2.2	A only ✓✓		
	1.2.3	Both A and B ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	None ✓✓		
1.3	1.3.1	Ammonia ✓✓	(5 x 2)	(10)
	1.3.2	Backyard/free range system ✓✓		
	1.3.3	Placenta retention ✓✓		
	1.3.4	Spermatogenesis ✓✓		
	1.3.5	Flushing/harvesting ✓✓		
1.4	1.4.1	Mineral licks ✓	(5 x 1)	(5)
	1.4.2	Antibodies ✓		
	1.4.3	Progesterone ✓		
	1.4.4	Mummification ✓		
	1.4.5	Pistolette ✓		

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canal of poultry****2.1.1 Identification of the parts**

- A - Crop ✓ (1)
- B - Proventriculus/glandular stomach ✓ (1)
- C - Ventriculus/gizzard/muscular stomach ✓ (1)

**2.1.2 Letter of the part that contains small stones**

- C ✓ (1)

**2.1.3 Reason for the presence of stones**

- Helps with mechanical digestion/grinding of the food ✓ (1)

**2.1.4 Parts of the alimentary canal of poultry that will not be found in sheep**

- Crop/A ✓
- Proventriculus/B ✓
- Gizzard/ventriculus/C ✓
- Cloaca/vent/uro-genital opening/E ✓
- Caeca/D ✓ (Any 2) (2)

**2.2 Composition of feed intake and excreted by a calf consuming 5kg****2.2.1 Feed component with lowest absorption rate**

- Crude fibre ✓ (1)

**2.2.2 TWO reasons for the answer**

- Has the highest rate of excretion ✓
- Fore stomachs/rumen not well developed/not functional ✓
- Absence/limited quantities of rumen micro flora ✓ (Any 2) (2)

**2.2.3 ONE reason for not recommending it for dairy cows**

- Crude protein concentration is too low/5% ✓
- Crude fibre concentration is too high/78% ✓ (Any 1) (1)

**2.2.4 Calculate dry material (DM) in the feed (kg)**

- (15% moisture)  $0,15 \times 5\text{kg} = 0,75\text{kg}$  moisture ✓
- $5\text{kg} - 0,75 = 4,25\text{kg}$  DM ✓
- OR**
- (85% DM)  $0,85 \times 5\text{kg}$  ✓
- $= 4,25\text{kg}$  DM ✓ (2)

2.3 **Pearson square method (Information on two feeds)**2.3 2.3.1 **Calculate percentage****(a) Maize meal**

$$\frac{31}{33} \times 100 \checkmark$$

$$= 93,93\% \checkmark$$

(2)

**(b) Soybean meal**

$$\frac{2}{33} \times 100 \checkmark$$

$$= 6,06\% \checkmark$$

(2)

2.3.2 **Cost of soybean in the ration**

- 0,0606 (6,06%) x 285kg = 17,27kg ✓
- 17,27kg x R4,58 per kg ✓
- = R79,10 ✓

(3)

2.4 **Biological value (BV) data**2.4.1 **Explanation of biological value**

- BV is an index of the % of nitrogen in a certain feed ✓
- It reflects the quality of protein in the feed ✓
- It is determined by the amino acid composition ✓
- and the ratio of amino acids in the protein ✓

(Any 2) (2)

2.4.2 **Relation between the BV and the quality of a feed**

- The higher the BV ✓
- The better the quality of a feed ✓

**OR**

- The lower the BV ✓
- The lower the quality of a feed ✓

(2)

2.4.3 **Identification of feed with the lowest BV**

Maize meal ✓

(1)

2.4.4 **Determination of suitability of maize meal**

- Suitable for energy/fattening
- Not suitable for production/growth/reproduction ✓ (Any 1) (1)

2.4.5 **Importance of feeding pigs feed with high BV**

- They are not able to produce their own amino acids ✓
- They need to be fed protein directly ✓

(2)

**2.5 Fodder flow planning****2.5.1 Calculate the:****(a) Quantity of Fescue (t DM/Ha)**

- $210 \text{ t/year} \div 15 \text{ Ha} \checkmark = 14 \text{ t DM/Ha} \checkmark$  (2)

**(b) Ha planted with maize for silage**

- $100 \text{ t/year} \div 10 \text{ t/Ha} \checkmark = 10 \text{ Ha} \checkmark$  (2)

**2.5.2 Fodder crop best utilized for:****(a) Summer grazing**

- Kikuyu (pasture)  $\checkmark$

**(b) Succulent crop during the winter**

- Maize/silage/kikuyu/fescue/ryegrass (winter rain area)  $\checkmark$

**(c) Most economic hay**

- Fescue  $\checkmark$

(3)

**[35]****QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Behaviour of farm animals****3.1.1 Area indicated**

- C - Blind spot  $\checkmark$
- D - Balancing point  $\checkmark$  (2)

**3.1.2 Position where the handler is safe**

Outside the flight zone/any area outside the circle/around A  $\checkmark$  (1)

**Reason**

In that position the handler is not a threat to the animal  $\checkmark$  (1)

**3.1.3 THREE guidelines important when handling cattle**

- Have knowledge/understanding of their behaviour  $\checkmark$
- Correct handling techniques  $\checkmark$
- Correct handling facilities  $\checkmark$
- Animal behaviour must be anticipated  $\checkmark$
- Be careful/watchful/prepared when working with animals  $\checkmark$
- Work calmly and quiet/no noise/no whips/sticks/dogs  $\checkmark$
- Be aware of their flight/safety zone  $\checkmark$  (Any 3) (3)

**3.2 Scenario on animal production systems****3.2.1 Farming systems practised**

- Farmer A - Commercial farming  $\checkmark$  (1)
- Farmer B - Subsistence farming  $\checkmark$  (1)

**3.2.2 Justification**

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

- 3.2.3 **Farmer with the highest contribution to environmental decline/deterioration** (1)  
Farmer A ✓
- 3.2.4 **TWO environmental effects** (2)  
  - Farmer A produces 1440 tons of manure per year ✓
  - Produce methane as a by-product or ruminant digestion ✓
- 3.3 **Apparatus used in sheep production process**
- 3.3.1 **Identification of apparatus** (1)  
Electrical hot knife/pliers ✓
- 3.3.2 **Function of apparatus in sheep** (1)  
Tail docking/castration ✓
- 3.3.3 **TWO reasons why apparatus is preferred** (2)  
  - Easy to use/fast ✓
  - Cheap ✓
  - Bloodless method ✓
  - Hygienic method ✓
 (Any 2)
- 3.3.4 **Age at administering** (1)  
  - Young as possible/before day 7 after birth ✓**Reason**  
  - Animals are easier to handle/smaller ✓
  - Less tissue damage/blood/stress to animals ✓
 (Any 1)
- 3.3.5 **ONE other apparatus that can be used** (1)  
  - Knife/Scalpel ✓
  - Rubber/elastrator ring/castrator ✓
  - Burdizzo ✓
 (Any 1)
- 3.4 **Diseases in farm animals**
- 3.4.1 **Complete table** (4)  
 A - Bacteria/Bacterium ✓  
 B - Cattle/Sheep/Goat ✓  
 C - Protozoa/Protozoan ✓  
 D - Lumpy wool ✓
- 3.4.2 **Disease affecting only dairy cows** (1)  
Mastitis ✓
- 3.4.3 **A management practice used that will prevent red water** (1)  
  - Inoculation/vaccination/immunisation ✓
  - Dipping to control ticks ✓
  - Move animals/veld management/rotational grazing/  
burning of the veld ✓
 (Any 1)
- 3.4.4 **Farm animal susceptible to mastitis** (1)  
Lactating dairy cattle/cow/female animal ✓

**3.5 Poisonous plants**

- 3.5.1 **Phrase describing 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 ✓ (2)
- 3.5.4 **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)
- [35]**

**QUESTION 4: ANIMAL REPRODUCTION****4.1.1 Reproductive organs of a bull**

- (a) B ✓ (1)
- (b) D ✓ (1)
- (c) A ✓ (1)

**4.1.2 TWO congenital defects**

- Sperm defects ✓
- Cryptorchidism ✓
- Hypoplasia ✓ (Any 2) (2)

**4.1.3 TWO functions of the hormone secreted by part D**

- Development of the secondary sex characteristics ✓
- Normal mating behaviour ✓
- Functioning of the accessory glands ✓
- Production of spermatozoa ✓
- Maintenance of the male duct system ✓ (Any 2) (2)

**4.2 Synchronisation**

- 4.2.1 **Identify process**  
Synchronisation of oestrus ✓ (1)
- 4.2.2 **ONE hormone inducing the process**
- Prostaglandin ✓
  - Synthetic progesterone/Progestin/Oestradiol ✓
  - Co-Synch oestrus synchronization/GnRH ✓
  - MGA/Melengestrol acetate ✓ (Any 1) (1)
- 4.2.3 **Financial implication of synchronisation**
- High costs for labour/hormone treatments ✓
  - High management inputs/costs ✓ (2)

**4.3 Re-arranging the statements in sequential order**

1. C ✓ (1)
2. D ✓ (1)
3. A ✓ (1)
4. E ✓ (1)
5. B ✓ (1)

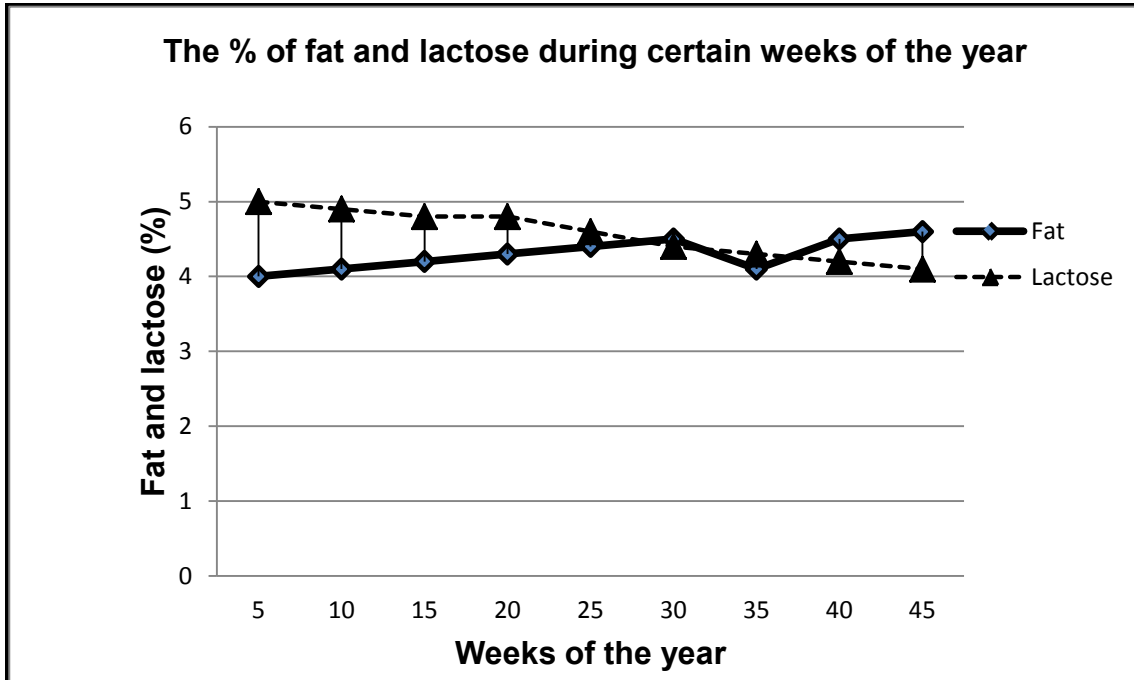
**4.4 Difficulties giving birth**

- 4.4.1 **Scientific term**  
Dystocia ✓ (1)
- 4.4.2 **THREE conditions that may interfere with normal parturition**
- Deviation of the head ✓
  - Flexion of the elbow ✓
  - Retention of the fore leg/legs ✓
  - Hydrocephalus ✓
  - Congenital defects/deformities ✓
  - Vaginal tear ✓
  - Twins/multiple births ✓
  - Premature/late birth ✓
  - Induction of parturition ✓
  - Posterior/abnormal presentation ✓
  - Incomplete cervical dilation ✓
  - Size of the calf ✓
  - Malnutrition of the cow ✓
  - Age of the female animal ✓ (Any 3) (3)
- 4.4.3 **Indigenous lubricant used by breeders in assisting delivery**  
Animal fat/oil/soap ✓ (1)



4.5 **Line graph**

4.5.1 **Line graph showing the percentage of fat and lactose**



**Criteria/rubric/marking guidelines**

- Correct heading ✓
- X-axis: correct calibrations and labelled (Weeks of the year) ✓
- Y-axis: correct calibrations and labelled (Fat and lactose) ✓
- Correct unit (%) ✓
- Line graph ✓
- Accuracy ✓ (6)

4.5.2 **Trend shown by the protein content of milk**

- Protein will increase from 3,0 to 4,2% ✓
- With progression in weeks/from week 5 to 45 ✓ (2)

4.5.3 **Constituents of the first milk**

- Immunoglobulin/Antibodies ✓
- Minerals/Calcium(Ca)/Phosphorus(P) ✓
- Vitamins ✓ (Any 2) (2)

**4.6 Semen****4.6.1 TWO semen dilutants**

- Buffers/sodium citrate ✓
- Egg yolk ✓
- Lipids/Skim milk ✓
- Nutrients/Fructose ✓
- Antibiotics/Penicillin/Streptomycin ✓
- Glycerol ✓

(Any 2) (2)

**4.6.2 TWO functions of the dilutants**

- Control the pH ✓
- Control the isotonic environment ✓
- Protect spermatozoa against temperature changes/shocks ✓
- Provide energy to spermatozoa/increase viability ✓
- Protect sperm against bacterial growth ✓
- Protect spermatozoa against the lethal effects of freezing ✓
- Increase the volume of semen ✓

(Any 2) (2)  
**[35]****TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**