



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P1

FEBRUARY/MARCH 2017

MEMORANDUM

MARKS: 150

This memorandum consists of 9 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	A ✓✓		
	1.1.2	C ✓✓		
	1.1.3	A/B ✓✓		
	1.1.4	B ✓✓		
	1.1.5	B ✓✓		
	1.1.6	C ✓✓		
	1.1.7	D ✓✓		
	1.1.8	D ✓✓		
	1.1.9	C ✓✓		
	1.1.10	A ✓✓	(10 x 2)	(20)
1.2	1.2.1	Both A and B ✓✓		
	1.2.2	B only ✓✓		
	1.2.3	None ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Amylase/ptyalin ✓✓		
	1.3.2	Commercial farmer ✓✓		
	1.3.3	Superovulation ✓✓		
	1.3.4	Ejaculation ✓✓		
	1.3.5	Courtship ✓✓	(5 x 2)	(10)
1.4	1.4.1	Cardiac ✓		
	1.4.2	Deep litter ✓		
	1.4.3	Dry ✓		
	1.4.4	Cloning/nuclear transfer ✓		
	1.4.5	Ovum/egg/female/reproductive sex cell/gamete ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION**

- 2.1 **A representation of the alimentary canal of a farm animal.**
- 2.1.1 **Farm animal represented by the alimentary canal**
Pig ✓ (1)
- 2.1.2 **Importance of parts A and C**
A – Assists in chemical digestion of food ✓ (1)
C – Assists in chemical digestion and absorption of food ✓ (1)
- 2.1.3 **Explanation of mechanical digestion**
- Breaking down of the complex food particles into smaller, simpler particles ✓
 - through physical objects/teeth ✓ (2)
- 2.2 **The absorption of nutrients from the small intestines**
- 2.2.1 **Identification of transport**
A – Active absorption/carrier molecule theory ✓ (1)
B – Passive absorption/osmosis/diffusion ✓ (1)
- 2.2.2 **Reason**
Active absorption
- Nutrients move from a lower concentrated area to a higher concentrated area/against the concentration gradient through an energy carrier (ATP) ✓
- Passive absorption**
- Nutrients move from a higher concentrated area to a lower concentrated area/along the concentration gradient ✓ (2)
- 2.2.3 **Identification of the structure labelled C**
Differential permeable/partially/semi-permeable membrane ✓ (1)
- 2.2.4 **Nutrient absorbed through**
(a) **Blood capillaries** – Digested protein/carbohydrates/ amino acids /glucose/vitamins/minerals ✓ (1)
(b) **Lacteal** – Digested fats/glycerol and fatty acids ✓ (1)
- 2.3 **The various feed components of a ration**
- 2.3.1 **Example of an energy rich concentrate**
Maize meal ✓ (1)
- 2.3.2 **Feed supplement acting as a source of energy in licks**
Molasses ✓ (1)

2.3.3 **Suitability of urea for pigs**

- Not suitable ✓

Reason

- It cannot be digested by pigs/pigs are monogastric/only ruminant animals can utilise ✓

(2)

2.3.4 **Tabulation of rations**

SOURCE OF PROTEIN	EXAMPLE
Natural protein	Lucerne hay ✓
NPN protein	Urea ✓

Table ✓

(3)

2.4 **Fodder flow programme**2.4.1 **Completion of the table**

$$(a) \quad 600 \times 120 = \frac{72\,000}{1000} \checkmark = 72 \text{ tons } \checkmark$$

$$(b) \quad 200 \times 120 = \frac{24\,000}{1000} \checkmark = 24 \text{ tons } \checkmark$$

(4)

2.4.2 **Determining the average cost to feed ONE animal for ONE day**

- R114 277,80 ÷ 113 animals ✓
- = R1011,31 ÷ 120 days ✓
- = R8,43 ✓ **OR**
- R114 277,80 ÷ 120 days ✓
- = R952,32 ÷ 113 animals ✓
- = R8,43 ✓

(3)

2.5 **Composition of two animal feeds**2.5.1 **Calculating nutritive ration (NR) of FEED B**

- $NR = 1: \frac{\% \text{ digestible non-nitrogen nutrients } \checkmark}{\% \text{ digestible protein}}$

- = 1: $\frac{58}{12}$ ✓

$$NR = 1: 4,831:5 \checkmark$$

OR

- $NR = \frac{TDN-DP}{DP} \checkmark$

- = 1: $\frac{70\% - 12\%}{12\%} \checkmark$

- $NR = 1: 4,83/1:5 \checkmark$

(3)

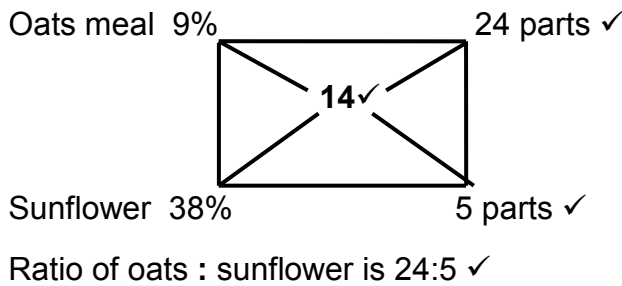
2.5.2 **Justification for not recommending feed A**

- Wide nutritive ratio ✓
- It has more carbohydrates and fats than proteins/fewer proteins than carbohydrates and fats ✓

(2)

2.6 **Pearson square method**

Calculating Pearson square



(4)
[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Scenario on the optimising of production**

3.1.1 **Natural resources**

- Lower production outputs ✓ due to animals fending for themselves (2)

3.1.2 **Feeding**

- Enough feed (pastures) ✓ will lead to good production ✓
- OR
- Less feed (pastures) ✓ will lead to poor production. ✓ (2)

3.1.3 **Exploitative practices**

- Where the natural balance/equilibrium is disturbed ✓/due to poor veld management ✓
- Utilise the natural resources to such an extent that it is permanently damaged ✓ and impossible to recover ✓
- More is taken out and nothing is put back in return ✓
- Maximum production no matter what the cost ✓
- Deliberate actions to damage the environment ✓ (Any 2) (6)

3.2 **Management practices conducted on piglets**

3.2.1 **Identification of management practices**

- A** – Injection/inoculation/vaccination ✓ (1)
- B** – Tail docking ✓ (1)

3.2.2 **Reason for the management practices**

- A** – To administer iron/Fe to piglets/supplementing/medication/immunisation ✓ (1)
- B** – Prevent tail biting/cannibalism ✓ (1)

3.2.3 **Mineral administered to piglets**

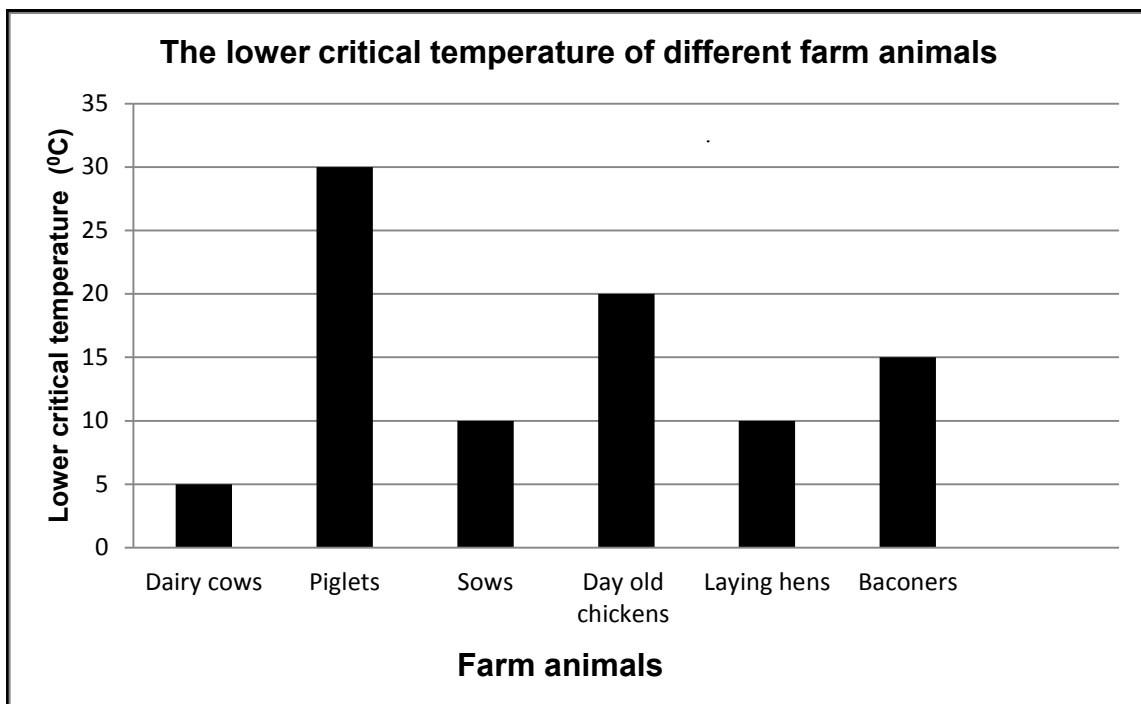
- Iron/Fe ✓ (1)

3.2.4 **Justification with TWO reasons**

- Sow milk contains a limited quantity of iron/not enough ✓
- Most effective way to administer iron/Fe ✓
- Initial feed intake of piglets is low/inadequate to support their iron requirements ✓ (Any 2) (2)

3.3 Body temperature and the lower critical temperature

3.3.1 Bar graph showing the lower critical temperatures of the different farm animals



Criteria/rubric/marking guidelines

- Correct heading ✓
- X-axis – correctly calibrated with label (Farm animals) ✓
- Y-axis – correctly calibrated with label (Lower critical temperature) ✓
- Correct units (°C) ✓
- Bar graph ✓
- Accuracy ✓

(6)

3.3.2 Identification of the animal inefficiently using feed

Piglets ✓

(1)

3.3.3 Reason for dairy cows producing milk at 6°C.

Their critical temperature is lower than 6°C ✓

(1)

3.4 Life cycle of a parasite

3.4.1 Classification and name the parasite above

- Internal parasite ✓
- Liver fluke ✓

(2)

3.4.2 Letter representing

(a) An intermediate host - D ✓

(1)

(b) Eggs hatch into larva - C ✓

(1)

- 3.4.3 **Precautionary measure**
 Keep animals away from moist/wet places/camping off infested ✓
 Control intermediate host (snails) burn infested areas ✓
 Keep areas around drinking places dry ✓
 Breed resistant animals ✓
 Graze animals on clean pastures/apply hygienic measures/use of feeders ✓
 Zero grazing/ rotational grazing ✓
 Provision of clean drinking water ✓
 Provision of good nutrition ✓
 Deworming animals at certain intervals ✓
 Isolation/separation of animals ✓ (Any1) (1)
- 3.4.4 **THREE economic implications of the parasite**
- Decrease/poor/degradation of products/loss of production ✓
 - Higher production costs/labour/time/medicines/ decreased profits/income ✓
 - Poor reproduction outputs ✓
 - Poor food conversion rate ✓
 - Negative impact on economy/no export ✓ (Any3) (3)
- 3.5 **Passage on chicken housing**
- 3.5.1 **TWO purposes of housing**
- To protect chickens from predators ✓
 - To create an environment for growth and development ✓ (2)
- 3.5.2 **TWO to consider when building a chicken house**
- Building to be cost effective ✓
 - Orientation of the building to be east to west ✓
 - Building site to be well drained and aerated ✓
 - Roofing material should be insulated and be reflective ✓
 - Enough ventilation ✓
 - Even distribution of light ✓
 - Should provide the right amount of heat ✓ (Any 2) (2)
- 3.5.3 **TWO examples of equipment in a poultry house**
- Feed troughs ✓
 - Water drinkers/troughs ✓
 - Lighting ✓
 - Nesting boxes ✓
 - Roosts ✓
 - Bedding ✓
 - Foot baths ✓
 - Air conditioning/fans/heaters ✓
 - Incubators ✓
 - Thermometer ✓
 - Egg trays ✓
 - Egg scales ✓ (Any 2) (2)

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QUESTION 4: ANIMAL REPRODUCTION**4.1 Embryo and foetus development****4.1.1 Identification of the structures**

- (a) **B** – Allantois ✓
- (b) **E** – Foetus ✓
- (c) **F** – Umbilical cord/placenta ✓ (3)

4.1.2 Provision of the following :**(a) ONE function**

- Protection of the foetus against shock/shock absorber ✓
- Prevents desiccation of the foetus/dehydration/drying of foetus ✓
- Lubrication of birth canal ✓
- Regulates temperature around the foetus ✓ (Any 1) (1)

(b) ONE constituent of D

- Amniotic fluid/water/liquid ✓ (1)

(c) Place where D occurs

- Inside amnion/C ✓ (1)

4.1.3 Time to detect rectal pregnancy

- 3–4 months into pregnancy/gestation ✓ (1)

4.2 Role of hormones**4.2.1 Explanation of hormone**

- The chemical substance secreted by endocrine glands/ovaries/uterus transported in the blood ✓ to specific parts/target organ of the body performing specialised functions ✓ (2)

4.2.2 Primary function of hormones**(a) Testosterone**

- Development of the secondary male characteristics ✓ (1)
- Enhances sexual desires ✓
- Stimulate sperm production ✓

(b) Luteinising hormone (LH)

- Rapture the membrane of the follicle during ovulation ✓
- Tightening the infundibulum around the ovary ✓
- Stimulates secretion of progesterone ✓
- Maturation of the oocytes ✓
- Formation of the corpus luteum ✓ (Any 1) (1)

(c) Oestrogen

- Develop the functions of the secondary sex organs ✓
- Responsible for the onset of oestrus/behaviour changes ✓
- Signs of oestrus ✓
- Contraction of the uterus ✓
- Promote growth of the mammary duct system ✓
- Stimulates Graafian follicle ✓
- Stimulates secretion of LH ✓
- Delays/inhibits secretion of FSH ✓
- Increases blood supply to the uterus ✓
- Prevents bacterial infection of the uterus ✓ (Any 1) (1)

- 4.2.3 **Hormone responsible for :**
(a) **Maintaining the Corpus luteum – Progesterone** ✓ (1)
(b) **Growth and development of the Graafian follicle – FSH** ✓ (1)
- 4.3 **Oestrus cycle of dairy cattle**
- 4.3.1 **Determination of the number of cows on oestrus**
10 ✓ (1)
- 4.3.2 **Indication of time 20 cows will be in oestrus**
18:00 to 00:00 ✓ (1)
- 4.3.3 **Tendency of cows in oestrus from 12:00 to 06:00**
Increase/higher/more/from 10 to 45 cows ✓ (1)
- 4.3.4 **The number of cows in oestrus from 18:00 to 06:00**
20 + 45 cows ✓
= 65 cows ✓ (2)
- 4.3.5 **Best time to inseminate**
12:00 to 18:00/in the afternoon ✓ (1)
- 4.3.6 **Reason**
Time when most (45 cows) are in oestrus/in heat ✓ (1)
- 4.4 **The udder of a dairy cow**
- 4.4.1 **Identification of the parts**
• **A – Alveolus** ✓ (1)
• **B – Lobe** ✓ (1)
• **C – Teat** ✓ (1)
- 4.4.2 **Definition of lactation**
• Period of milk production by female animals/cows ✓
• Starting soon after parturition for an average of 305 days ✓
• Involves the hormones prolactin and oxytocin ✓ (Any 2) (2)
- 4.4.3 **Comparison of milk and butterfat production**
• Milk production increases until peak production thereafter it decreases ✓
• Butterfat production decreases until peak production thereafter it increases ✓ (2)
- 4.5 **Difficult births**
- 4.5.1 **Scientific term for difficult births**
Dystocia ✓ (1)

- 4.5.2 **Reason for difficult births in heifers**
- Heifers are physically smaller✓and less developed (younger)/age ✓
 - Incorrect presentation/position/posture✓
 - Too large foetus/hydrocephalus✓
 - Deformities of the foetus✓
 - Torsion/twisting of the foetus✓
 - Prolapsed uterus✓
 - Multiple births/twins✓
 - Size of pelvic area✓
 - Weak/ ineffective labour✓
 - Cervix failing to dilate✓
 - Prolonged gestation/pregnancy period✓
 - Malnutrition✓
 - Diseases✓
- (Any 2) (2)
- 4.5.3 **TWO managerial measures to reduce difficult births**
- Use bulls renowned for small calves/low birth weight ✓
 - Mate heifers at the ideal age/mass/not too early ✓
 - Use a controlled/well-planned breeding season ✓
 - Well planned feeding programme/avoid overfeeding✓
 - Planned health programme ✓
- (Any 2) (2)
- 4.5.4 **Definition of placenta retention**
- The failure to expel the placenta/membranes ✓
 - within 12 hours after parturition/birth ✓
 - with negative effects/complications ✓
- (Any 2) (2)
- [35]**
- TOTAL SECTION B: 105**
GRAND TOTAL: 150