



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**AGRICULTURAL SCIENCES P1
FEBRUARY/MARCH 2017
MEMORANDUM**

MARKS: 150

*Approved
setlone LA
Internal moderator
25/03/2017*

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25/03/2017*

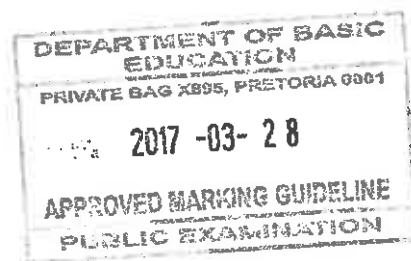
This memorandum consists of 10 pages.

*Approved
D.F.E Khumalo
29/3/2017*

DEPARTMENT OF BASIC
EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2017 -03- 28
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

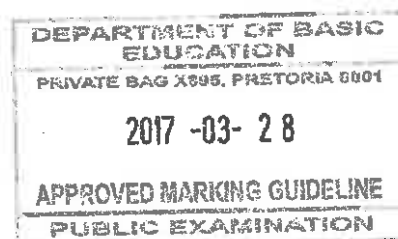
SECTION A**QUESTION 1**

1.1	1.1.1	A ✓✓	(10 x 2)	(20)
	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 ✓✓		
1.2	1.2.1	Both A and B ✓✓	(5 x 2)	(10)
	1.2.2	B only ✓✓		
	1.2.3	None ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	A only ✓✓		
1.3	1.3.1	Amylase/ptyalin ✓✓	(5 x 2)	(10)
	1.3.2	Commercial farmer ✓✓		
	1.3.3	Superovulation ✓✓		
	1.3.4	Ejaculation ✓✓		
	1.3.5	Courtship ✓✓		
1.4	1.4.1	Cardiac ✓	(5 x 1)	(5)
	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 ✓		

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 and mechanical 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 means/teeth/chewing/mastication/churning ✓ (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) $600 \times 120 = \frac{72\ 000}{1000} \checkmark = 72 \text{ tons } \checkmark$

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

(4)

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

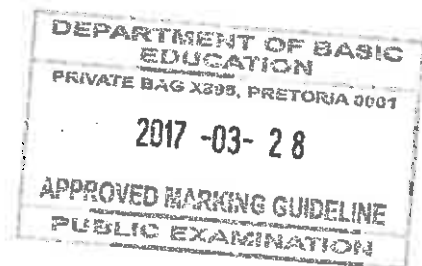
- $R114\ 277,80 \div 113 \text{ animals } \checkmark$
 $= R1011,31 \div 120 \text{ days } \checkmark$
- $= R8,43 \checkmark$ OR
- $R114\ 277,80 \div 120 \text{ days } \checkmark$
- $= R952,32 \div 113 \text{ animals } \checkmark$
- $= R8,43 \checkmark$

(3)

2.5 **Composition of two animal feeds**

2.5.1 **Calculating nutritive ration (NR) of FEED B**

- $NR = 1: \frac{\% \text{ digestible non-nitrogen nutrients } \checkmark}{\% \text{ digestible protein}}$
- $= 1: \frac{58}{12} \checkmark$
- $NR = 1: 4,831:5 \checkmark$
OR
- $NR = 1: \frac{TDN-DP \checkmark}{DP}$
 $= 1: \frac{70\%-12\% \checkmark}{12\%}$
- $NR = 1: 4,83 / 1:5 \checkmark$



(3)

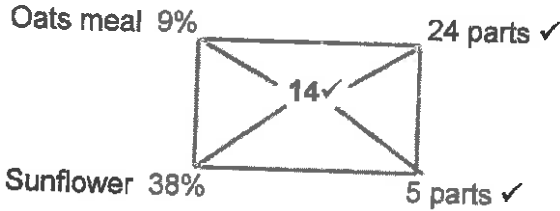
2.5.2 **Justification for not recommending feed A**

- Wide nutritive ratio ✓
- It has more carbohydrates and fats than proteins /fewer proteins than carbohydrates and fats ✓ (2)

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2.6 **Pearson square method**

Calculating Pearson square



Ratio of oats : sunflower is 24:5 ✓

(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)

Feeding

- 3.1.2
- 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)

(2)

3.2 **Management practices conducted on piglets**

3.2.1 **Identification of management practices**

- A – Injection/inoculation/vaccination ✓
- B – Tail docking ✓

(1)

(1)

Reason for the management practices

- A – To administer iron/Fe to piglets/supplementing/medication /immunization ✓

(1)

- B – Prevent tail biting/cannibalism ✓

(1)

3.2.3 **Mineral administered to piglets**

Iron/Fe ✓

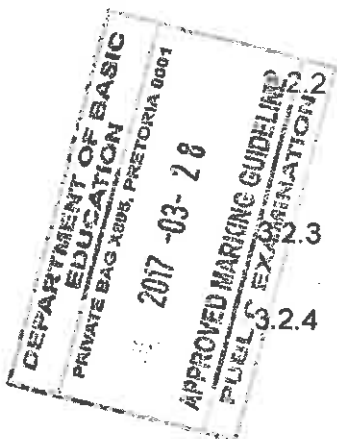
(1)

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)

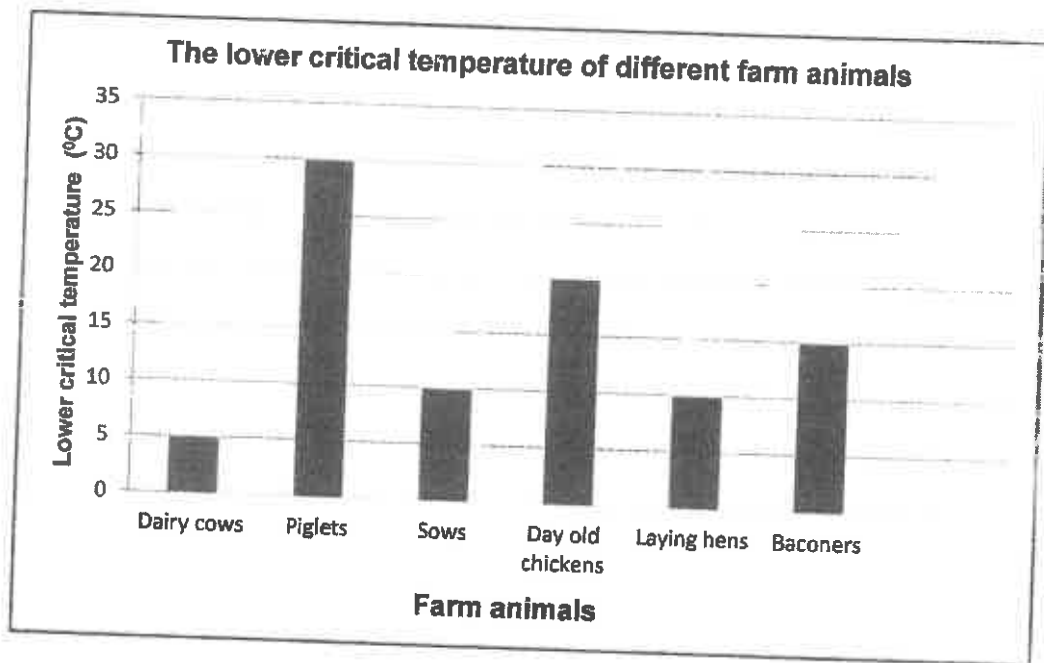


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3.3 **Body temperature and the lower critical temperature**

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 5°C ✓

(1)

3.4 **Life cycle of a parasite**

3.4.1 **Classification and name the parasite above**

- Internal parasite ✓
- Liver fluke ✓

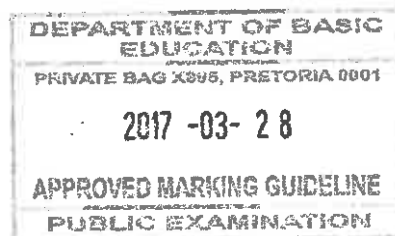
(2)

3.4.2 **Letter representing**

- (a) An intermediate host - D ✓
- (b) Eggs hatch into larva - C ✓

(1)

(1)



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- 3.4.3 **Precautionary measure**
- Keep animals away from moist/wet places/camping off infested areas ✓
 - 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 ✓
- (Any 1) (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 profit/ income ✓
 - Poor reproduction outputs ✓
 - Poor food conversion rate ✓
 - Negative impact on economy/ no export ✓
- (Any 3) (3)

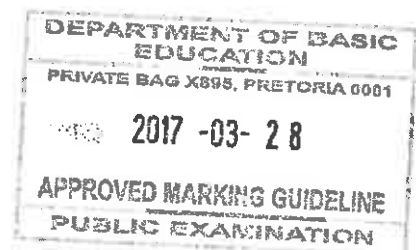
3.5 **Passage on chicken housing**

- 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 factors 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 conditioners/fans/heaters ✓
- Incubators ✓
- Thermometer ✓
- Egg trays ✓
- Egg scales ✓



(Any 2) (2)
[35]

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/dehydration/drying of the foetus ✓
- Lubrication of birth canal ✓
- Regulates temperature around the foetus ✓
- Prevents foetus from attaching to other tissues ✓

(Any 1)

(1)

(b) ONE constituent of D

- Amniotic fluid/water/liquid ✓

(1)

(c) Place where D is found

- Inside amnion/C ✓

(1)

4.1.3 Time to detect rectal pregnancy

3–4 months during 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 ✓
- Enhances sexual desire ✓
- Stimulates sperm production ✓

(Any 1)

(1)

(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 ✓

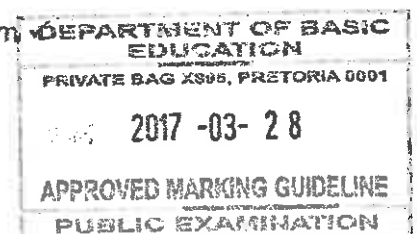
(Any 1)

(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 ✓

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- Increases blood supply to the uterus ✓
 - Prepares uterus for implantation ✓
 - Prevents bacterial infection of the uterus ✓
- (Any 1) (1)
- 4.2.3 **Hormone responsible for:**
- (a) Maintaining the corpus luteum – Progesterone ✓
 - (b) Growth and development of Graafian follicles - FSH ✓
- (1)
(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**
Increased number/higher/more/from 10 to 45 cows ✓
- (1)
- 4.3.4 **The number of cows in oestrus from 18:00 to 06:00**
20 cows + 45 cows ✓
= 65 cows ✓
- (2)
- 4.3.5 **Best time to inseminate**
12:00 – 18:00/in the afternoon ✓
- (1)
- 4.3.6 **Reason**
Time when most (45 cows) are in oestrus/on heat ✓
- (1)
- 4.4 **The udder of a dairy cow**
- 4.4.1 **Identification of the parts**
A – Alveolus ✓
B – Lobe ✓
C – Teat ✓
- (1)
(1)
(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 hormone prolactin and oxytocin ✓
- Any 2) (2)
- 4.4.3 **Comparison of milk and butterfat production**
- Milk production increases until peak period thereafter it decreases ✓
 - Butterfat production decreases until peak period 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 the 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