basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2017

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A

QUESTION 1

1.1	1.1.1	C ✓✓		
	1.1.2	D ✓✓		
	1.1.3	A ✓✓		
	1.1.4	D ✓✓		
	1.1.5	C ✓✓		
	1.1.6	B ✓✓		
	1.1.7	B ✓✓		
	1.1.8	D ✓✓		
	1.1.9	A ✓✓		
	1.1.10	C ✓✓	(10 x 2)	(20)
1.2	1.2.1	None ✓✓		
	1.2.2	Both A and B ✓✓		
	1.2.3	A only ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Popping/micronising/roasting ✓✓		
	1.3.2	Homoeothermic/endothermic ✓✓		
	1.3.3	Superovulation ✓✓		
	1.3.4	Buffer ✓✓		
	1.3.5	Progesterone ✓✓	(5 x 2)	(10)
1.4	1.4.1	Cardiac ✓		
	1.4.2	Blue ✓		
	1.4.3	Hypoplasia ✓		
	1.4.4	Amnion ✓		
	1.4.5	Semen straw ✓	(5 x 1)	(5)
			TOTAL SECTION A:	**45**

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 An alimentary canal of a farm animal

2.1.1 Classification of the animal
Non-ruminant ✓ (1)

2.1.2 Reason visible from the diagram
It has a simple/single/monogastric stomach ✓ (1)

2.1.3 TWO functions of the digestive juice in A
- Changes the pH from acid to alkaline/helps to neutralise the acid from the gastric juices ✓
- Increases the solubility of fats ✓
- Emulsification of fats ✓
- Promotes the absorption of fatty acids and glycerol ✓
- Assists with the absorption of fat- soluble vitamins ✓
- Acts as an antiseptic ✓
- Acts as a detoxifying agent ✓
- Activates lipase ✓
- Lubrication of the alimentary canal ✓
- Enhances peristalsis ✓ (Any 2) (2)

2.1.4 Enzyme digesting fats
Lipase ✓ (1)

2.2 Types of feeds

2.2.1 Classification of feed types
A - Concentrates ✓ (1)
B - Roughages ✓ (1)

2.2.2 Group of feed type C
Protein rich feeds ✓ (1)

2.2.3 TWO examples of feed type D
- Maize meal ✓
- Oats meal ✓
- Barley meal ✓
- Sorghum meal ✓
- Rye meal ✓
- Wheat meal ✓ (Any 2) (2)

2.2.4 Justification of feeding feeds labelled B to ruminants
- Roughages help to prevent bloating ✓
- Supply the necessary bulkiness of their ration ✓
- Enhance rumen development and functioning ✓
- Good roughages stimulate production and growth ✓
- Good roughages are a source of minerals ✓ (Any 2) (2)

2.3 Nutritional composition of feeds

2.3.1 Most suitable feed for young growing farm animals

Feed B ✓ (1)

2.3.2 Reason for the answer in QUESTION 2.3.1

- Feed has a narrow nutritive ratio ✓
- Rich in proteins necessary for growth ✓
- Has more protein than carbohydrates and fats ✓ (Any 1) (1)

2.3.3 Percentage of digestible non-nitrogen nutrients in feed A

32% + 38% ✓
= 70% ✓ (2)

2.4 Digestibility of a hay

2.4.1 Comment on the suitability of the hay

- Not suitable ✓ (1)

Reason

- Has a high fibre content/hay is poorly digestible/45% ✓
- Cannot be fed alone/needs supplementation ✓
- Low protein content ✓ (Any 1) (1)

2.4.2 TWO measures to improve the digestibility of hay

- Supplementation with NPN ✓
- Supplementation with molasses ✓
- Treatment with agents that improve its nutritive value ✓
- Milling ✓
- Pelleting ✓
- Softening ✓ (Any 2) (2)

2.5 Fodder flow programme

2.5.1 TWO problems to be encountered by the farmer

- Shortage/deficit of feed is 174 000kg /feed supply during dry season is 216 000kg whilst feed required is 390 000kg ✓
- Increased consumption due to pregnancy and lactation ✓ (2)

2.5.2 ONE precautionary measure a farmer needs to take

- Store feed/feed reserve for the dry season ✓
- Reschedule the breeding season to fall during wet season ✓
- Reduce the number of animals before dry season/culling ✓
- Good pasture/fodder flow management practises ✓ (Any 1) (1)

2.5.3 **Amount of feed required per month**

100 x 21kg x 30 = 63 000kg ✓
= $\frac{63\ 000kg}{1000}$ ✓
= 63 tons ✓

OR

360 000kg + 390 000kg = $\frac{750\ 000kg}{12}$ ✓
= $\frac{62\ 500kg}{1000}$ ✓
= 62,5/63 tons ✓ (3)

2.6 **Feed components**

2.6.1 **Feed nutrient supplying most energy**

Fats ✓ (1)

2.6.2 **Units of measuring energy**

Mega joule/MJ/kilojoule/kJ/Joule/J ✓ (1)

2.6.3 **TWO reasons for calculating energy value of feeds to a farmer**

- To determine the feeding standards ✓
- To be able to provide a recommended diet ✓
- Helps in the formulation of rations ✓ (Any 2) (2)

2.7 **Minerals and vitamins**

2.7.1 **Completion of missing information**

A Zinc/Zn ✓ (1)
B Metritis/inflammation of the uterus ✓ (1)
C Stiff lamb/muscle dystrophy/white muscle ✓ (1)

2.7.2 **Methods of supplementing nutrients**

(a) Injections/supplementary ration ✓
(b) Dissolve them in drinking water/dosing ✓ (2)

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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Pie chart on the size of the area, the number and type of farm animals**

3.1.1 **Animal under intensive conditions**

Sheep ✓ (1)

3.1.2 **Reason for the answer in QUESTION 3.1.1**

- 100 sheep are kept on a small area ✓

OR

- A large number of sheep is kept on a small area ✓ (1)

3.1.3 **Identification of farm animals**

(a) Poultry ✓ (1)
(b) Cattle/goats ✓ (1)
(c) Sheep/goats ✓ (1)

3.1.4 **Calculation of the % of sheep**

25 + 100 + 30 + 10 = 165 ✓
$= \frac{100 \times 100}{165}$ ✓
= 60, 6/61% ✓ (3)

3.2 **Animal diseases**

3.2.1 **Animal diseases**

A - Anthrax ✓ (1)
B - Vaccination/inoculation ✓ (1)
C - Mosquitoes ✓ (1)
D - Blood stained nasal discharge/abortions/fever ✓ (1)
E - Red/brown urine/fever ✓ (1)

3.2.2 **Role of the state**

Vaccination/inoculation ✓ (1)

3.2.3 **TWO duties of stock owners to prevent the spread of deadly diseases**

- Burn the carcasses ✓
- Dispose of all the manure/bedding/ other contaminated materials ✓
- Clean/disinfect housing ✓
- Report to the authorities ✓
- Quarantine/isolate affected animals ✓
- Treat animals with antibiotics ✓
- Vaccination/inoculation ✓ (Any 2) (2)

3.3 **Measures by the state**

3.3.1 Hygiene/legislation ✓ (1)

3.3.2 Quarantine/ban on imports/legislation ✓ (1)

3.3.3 Reporting notifiable disease to authorities/veterinary services/SAPS/ legislation/destroy infected animals ✓ (1)

3.4 **Data is captured in a graph**

3.4.1 **Deduction from the graph the range it took lambs to reach 1,8 kg**

From day 8 to 24 ✓ (1)

3.4.2 **The tabulation of data**

The table below shows the weight gain of lambs over a period of 40 days ✓
✓

Days		Weight gain ✓ (g) ✓	
0		0	
4		400	
8		400	
12		1 200	
16		1 200	
20	✓	1 200	✓
24		1 800	
28		1 800	
32		1 800	
36		1 000	
40		0	

Criteria/rubric/marking guidelines

- Correct heading ✓
- Correct labelling of days and weight gain ✓
- Populated table ✓
- Correct unit (g) ✓
- Correct reading of the days ✓
- Correct reading of the weight gain ✓ (6)

3.5 **Structures, apparatus and appliances used to handle and manage farm animals**

3.5.1 Fence ✓ (1)

3.5.2 Rope/halter/immobiliser/chute/crush ✓ (1)

3.5.3 Elastrator/rubber ring/burdizzo/surgical blade/knife ✓ (1)

3.5.4 Shed/housing ✓ (1)

3.6 **External parasites**

3.6.1 **Identification of the external parasite**

Mite ✓ (1)

3.6.2 **The symptom of a severe infestation of the parasite**

Mange/scab ✓ (1)

3.6.3 **One visible sign of the symptom mentioned in QUESTION 3.6.2**

- Severe itching/rubbing/scratching/skin irritation ✓
- Wool/hair loss ✓
- Dermatitis/inflammation of the skin ✓
- Hairless patches/lersions ✓
- Animal does not feed well/weight loss ✓ (Any 1) (1)

3.6.4 **TWO economic implications of the parasite**
- Loss in production/income/yield ✓
- Quality of products will be damaged/reduced ✓
- Financial implications/increased cost ✓
- Cost of labour/time consuming ✓ (Any 2) (2)

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QUESTION 4: ANIMAL REPRODUCTION

4.1 **A reproductive process occurring in cows**

4.1.1 **Identification of the process above**
Milking/lactation ✓ (1)

4.1.2 **THREE visible stimuli from the picture**
- The milking equipment ✓
- The calf ✓
- Touching of the udder/milker ✓ (3)

4.1.3 **Hormone responsible for the contractions of the glandular cavity during the process**
Oxytocin ✓ (1)

4.1.4 **The reproductive stage that lasts for 282 days in cattle**
Pregnancy/gestation ✓ (1)

4.2 **Stages of the oestrus cycle**

4.2.1 **Labels of the phases of oestrus cycle**
A - Oestrus ✓ (1)
B - Di oestrus ✓ (1)
C - Met oestrus ✓ (1)
D - Pro oestrus ✓ (1)

4.2.2 **Indication of the letters representing the stage of oestrus**
(a) A ✓ (1)
(b) C ✓ (1)

4.3 **Process generally used in the reproduction of farm animals**

4.3.1 **The process illustrated in the diagram**
Nuclear transfer/cloning ✓ (1)

4.3.2 **Identification of the cells**
A - Recipient cell with nucleus/egg cell/ovum ✓ (1)
B - The nucleus of the donor cell ✓ (1)
D - The fused cell ✓ (1)

4.3.3 **TWO different types of the process**
- Reproductive cloning ✓
- Therapeutic cloning ✓ (2)

4.4 Apparatus used in the Artificial Insemination (AI) process

4.4.1 Identification of the apparatus

A - Artificial vagina ✓ (1)
B - Pistolette ✓ (1)
C - Nitrogen flask/canister/tank ✓ (1)

4.4.2 Function of each apparatus

A - Collection of semen ✓ (1)
B - For the deposition of semen in the cow during AI ✓ (1)
C - Storage of semen for longer periods ✓ (1)

4.4.3 TWO basic requirements for the collection of semen from bulls

- Should be close to a laboratory ✓
- Equipment must be clean/sterilised ✓
- Availability of appropriate equipment/artificial vagina ✓
- Male animal must be clean/healthy ✓
- Warm collecting vial/placed in a water bath/prevent temperature shock ✓
- Personnel must be trained/experienced ✓
- Floor not slippery✓
- Semen must be protected from direct sunlight ✓
- Teaser cows availability ✓ (Any 2) (2)

4.5 Synchronisation schedule of female animals

4.5.1 Identification of the process

Synchronisation of oestrus ✓ (1)

4.5.2 TWO disadvantages of a synchronisation schedule in cattle

- Poor nutrition/body condition/health will affect the process negatively ✓
- Needs good/expensive facilities ✓
- Labour/time intensive ✓
- Involves skilled management and technologies ✓ (Any 2) (2)

4.5.3 TWO techniques used in the synchronisation of female animals

- Synthetic progesterone/progestin/oestradiol ✓
- Co-Synch/gonadotropin/co-synch synchronisation ✓
- Ear patches/implants ✓
- Vaginal insurgents ✓ (Any 2) (2)

4.5.4 Indication of the time (day) when the cows will be inseminated

Day 35 **–** 40 ✓ (1)

4.6 **THREE causes for lack of libido**

- Immaturity ✓
- Inexperience ✓
- Diseases ✓
- Underfeeding/overfeeding/malnutrition ✓
- Old age/senility ✓
- Overwork/exhaustion/over exertion ✓
- Improper handling/stress ✓
- Lack of testosterone ✓
- Temperament ✓
- Environment ✓

(Any 3) (3)
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TOTAL SECTION B: 105

GRAND TOTAL: 150