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Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2022

AGRICULTURAL SCIENCES P1 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 10 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	D ✓✓		
	1.1.3	C ✓✓		
	1.1.4	A ✓✓		
	1.1.5	B ✓✓		
	1.1.6	B ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	B ✓✓		
	1.1.10	A ✓✓	(10 x 2)	(20)
1.2	1.2.1	B only ✓✓		
	1.2.2	A only ✓✓		
	1.2.3	None ✓✓		
	1.2.4	Both A and B ✓✓		
	1.2.5	A only ✓✓	(5 x 2)	(10)
1.3	1.3.1	Bile juice ✓✓		
	1.3.2	Bunching/swarming ✓✓		
	1.3.3	Anovulation ✓✓		
	1.3.4	Scrotum/Cremaster muscles ✓✓		
	1.3.5	Dropsy ✓✓	(5 x 2)	(10)
1.4	1.4.1	Ether extract ✓		
	1.4.2	Topical ✓		
	1.4.3	Chin-ball marker ✓		
	1.4.4	Pistollete ✓		
	1.4.5	Embryo flushing ✓	(5 x 1)	(5)
			TOTAL SECTION A:	**45**

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SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 **Digestive system of farm animals**

2.1.1 **Name of the farm animal**
Pig ✓ (1)

2.1.2 **Reason**
It has got a single stomach. ✓ (1)

2.1.3 **Indication of how part labelled A differs from that of a fowl.**
Oesophogus of a fowl has a bag like extension (crop), ✓ and that of a pig has no extension (crop). ✓ (2)

2.1.4 **Identification of the letter**
(a) **Secretion of rennin** – B ✓ (1)
(b) **Storage of fat-soluble vitamins** – C ✓ (1)

2.1.5 **Reason why a pig cannot digest maize stalk**
It has a simple stomach, ✓ with no rumen micro-organisms to digest the maize stalk. ✓ (2)

2.2 **Processes involved in the digestion**

2.2.1 **Re-arranging the processes**
D ✓
A ✓
E ✓
C ✓
B ✓ (5 x 1) (5)

2.2.2 **Name of the structure enabling absorption**
Villi ✓ (1)

2.3 **Feed types**

2.3.1 **Classification of feeds**
FEED A – Roughage ✓
FEED B – Concentrates ✓ (2 x 1) (2)

2.3.2 **Identification of the feed**

(a) Feed B/concentrates ✓ (1)

(b) Feed A/roughage ✓ (1)

(c) Feed B/concentrates ✓ (1)

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2.3.3 **Calculation of the nutritive ratio of feed A**

$$NR = 1 : \frac{\%\ TDN - \%\ DP}{\%DP} \checkmark$$

$$1 : \frac{56\% - 6\%}{6\%} \checkmark$$

1 : 8,33 ✓

OR

$$NR = 1 : \frac{\%\ DNNS}{\%DP} \checkmark$$

$$1 : \frac{50\%}{6\%} \checkmark$$

1 : 8,33 ✓ (3)

2.4 **Digestibility of hay**

2.4.1 **Calculation of digestibility co-efficient of the hay**

$$DC = \frac{\text{Dry material intake (kg)} - \text{dry mass of manure (kg)}}{\text{Dry material intake (kg)}} \times \frac{100}{1} \checkmark$$

$$= \frac{12\ kg - 5\ kg}{12\ kg} \times \frac{100}{1} \checkmark$$

= 58,3 ✓% ✓ (4)

2.4.2 **ONE supplement to increase palatability and digestibility of the hay**

- Supplementing with molasses ✓
- Supplementing with NPN ✓ (Any 1 x 1) (1)

2.5 **Nutrients deficiency symptoms**

2.5.1 **Name of the deficiency symptom**
ANIMAL A – Goitre ✓
ANIMAL B – Curled-toe paralysis ✓ (2 x 1) (2)

2.5.2 **Indicate the nutrient deficient**
ANIMAL A – Iodine ✓
ANIMAL B – Vitamin B2/riboflavin ✓ (2 x 1) (2)

2.5.3 **Feed source to correct the deficiency in animal A**
Marine salt ✓ (1)

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2.6 **Fodder flow**

2.6.1 **Number of months in which the veld had no fodder**
3 months ✓ (1)

2.6.2 **Calculation of the total feed required in May**
Number of animals x requirement/kg/day x 31
= 100 x 5 kg x 31 ✓
= 155 00 kg ✓ (2)
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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Increasing production in production units**

3.1.1 **Identification of the production unit**
Production unit B ✓ (1)

3.1.2 **TWO reasons**
- Breeding to maximise production ✓
- Breeding to increase profit ✓ (2)

3.1.3 **TWO basic housing structures found in the production unit B**
- Holding shed ✓
- Feed shed ✓
- Holding pen ✓ (Any 2 x 1) (2)

3.1.4 **TWO reasons to justify a low input cost in production unit A**
- Breeding takes place in the animal's natural environment ✓
- Animals rely on trees for protection against extreme temperatures ✓
- Animals fed on grazing only ✓ (Any 2 x 1) (2)

3.2 **Name of the animal displaying behaviours when under stress**
(a) **Pawing** – Cattle ✓ (1)
(b) **Snout rubbing** – Pigs ✓ (1)
(c) **Feigned charging movements** – Cattle ✓ (1)

3.3 **ONE requirement when moving farm animals along/across the road**
Carry a red flag ✓ (1)

3.4 **Handling equipment/apparatus**

3.4.1 **Indication of the purpose for using equipment**
A – Branding ✓
C – Castrating/tail docking ✓ (2 x 1) (2)

3.4.2 **TWO reasons for the use of apparatus**
- Easy to use/fast ✓
- Cheap ✓
- Bloodless method ✓
- Hygienic method ✓ (Any 2 x 1) (2)

3.4.3 **Name of the equipment**
B – Drenching gun/dosing gun ✓ (1)

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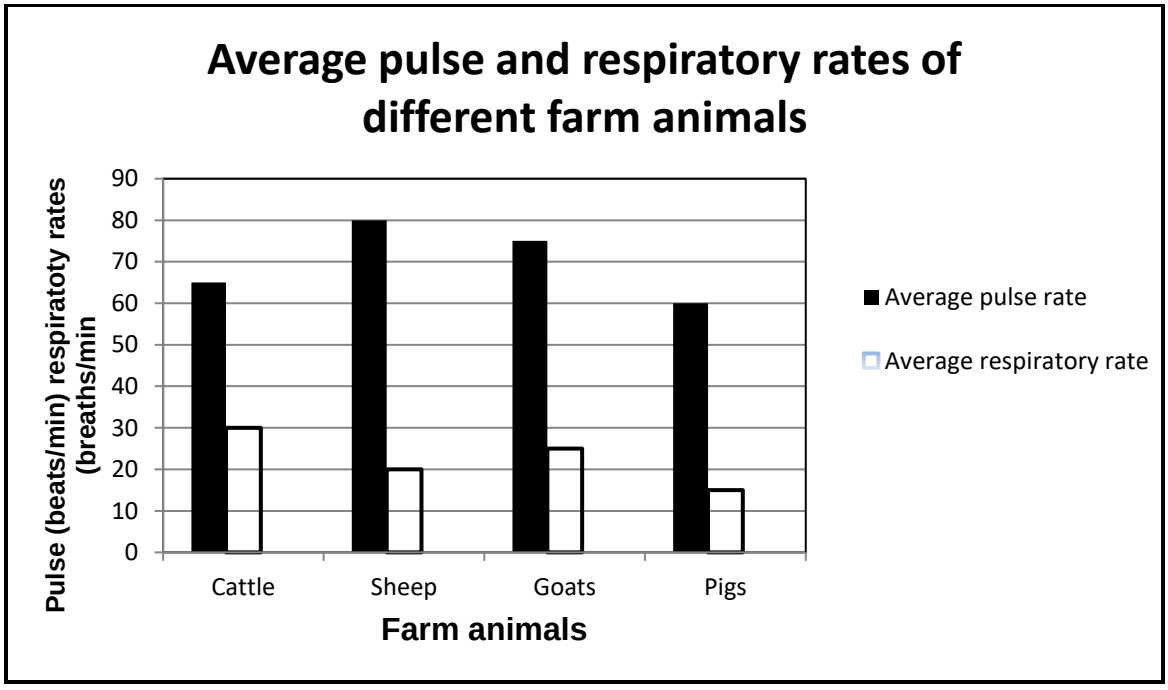
3.4.4 **TWO guidelines for handling cattle**

- Do not yell when working with animals ✓
- Avoid using a cloth swinging in the wind as it will cause animals to baulk ✓
- Do not approach animals from the back ✓
- Handler to talk softly to animals when approaching them ✓
- Do not work with big and small animals in the same crush ✓
- Use a proper handling facility ✓
- Use a crush/chute that is wide enough for an animal and with minimal distraction ✓
- Leave yourself a way to get out if necessary, when you are inside a handling facility ✓
- Announce your presence when approaching animals through touch ✓ (Any 2 x 1) (2)

3.5 **Average pulse rate and respiratory rates of different farm animals**

3.5.1 **Bar graph**



Criteria/rubric/marking guideline

- Correct heading ✓
- *x*-axis: Correctly calibrated and labelled (Farm animals) ✓
- *y*-axis: Correctly calibrated and labelled (Pulse rate and respiratory rate) ✓
- Bar graph ✓
- Accuracy ✓
- Correct units (Heart beats/min and breaths/min) ✓ (6)

3.5.2 **Explanation of the trend**

Pulse rate is faster ✓ than respiratory rate per minute in all animals ✓ (2)

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3.6 **Life cycle of a parasite**

3.6.1 **Classification of the parasite**
Internal parasite ✓
Name
Tapeworm ✓ (2)

3.6.2 **Identification of the visible symptom**
Proglottids ✓ (1)

3.6.3 **Treatment of animals infested with parasite**
Administering anthelmintics/de-wormers ✓ (1)

3.7 **Animal diseases in farm animals**

3.7.1 **Name of the pathogen**
B – Bacteria ✓
C – Fungi ✓ (2)

3.7.2 **Name of the disease**
A – Red water ✓
D – Rift Valley Fever ✓ (2)

3.7.3 **Identification of the letter of the symptoms of a disease transmitted by blue tick**
A ✓ (1)
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QUESTION 4: ANIMAL REPRODUCTION

4.1 Spermatogenesis

4.1.1 Name of the organ
Testis ✓ (1)

4.1.2 Identification of cells
A – Primary spermatocyte ✓
C – Spermatids ✓ (2)

4.1.3 Type of cell division
Meiosis 2 ✓ (1)

4.1.4 Name of the part (1)
(a) Acrosome ✓ (1)
(b) Mitochondrion ✓

4.1.5 TWO similarities between spermatogenesis and oogenesis
- They both produce haploid cells through meiosis ✓
- They both produce sex cells/gametes ✓ (2 x 1) (2)

4.2 Mating behaviour in bulls

4.2.1 Hormone regulating mating in bulls
Testosterone ✓ (1)

4.2.2 TWO senses stimulating mating response of bulls
- Smell ✓
- Sight ✓
- Touch ✓ (Any 2 x 1) (2)

4.3 Stages of parturition

4.3.1 Identification of the process
Parturition ✓ (1)

4.3.2 Name of the stage
A – Expulsion/ejection of the placenta ✓
B – Preparatory stage ✓
C – Ejection/expulsion of the foetus ✓ (3)

4.3.3 Hormone causing corpus luteum to regress
Prostaglandins ✓ (1)

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4.3.4 **TWO signs visible when an animal approaches parturition**

- Vulva swells and becomes softer ✓
- Mucus strings flows from the vulva ✓
- The cow urinates and defecates often ✓
- Cow stops eating ✓
- Isolates herself from the herd ✓
- It shows signs of distress and discomfort ✓
- Teats are painfully swollen and milk starts dripping ✓
- The cow is restless and groans ✓
- There may be a change in body temperature ✓
- The belly droops ✓ (Any 2 x 1) (2)

4.4 **Artificial insemination (AI)**

4.4.1 **Re-arrangement of the steps involved in AI in a sequential order**

- Semen collection ✓
- Semen evaluation ✓
- Semen dilution ✓
- Semen storage ✓ (4)

4.4.2 **Indication of the component of a dilutant**

(a) Egg yolk/glycerol ✓
(b) Antibiotics ✓
(c) Buffers ✓ (3)

4.4.3 **Temperature for storing semen over years**

-196 ˚C ✓ (1)

4.5 **Hormonal changes during oestrus cycle**

4.5.1 **Identification of hormones**

A – Follicle stimulating hormone/FSH ✓
C – Oestrogen ✓
D – Progesterone ✓ (3)

4.5.2 **TWO importance of FSH during oestrus cycle**

- It stimulates the formation of graafian follicles ✓
- Responsible for the production of oestrogen in the graafian follicles ✓ (2)

4.5.3 **Name of the process**

Ovulation ✓ (1)

4.5.4 **Role of luteinizing hormone during ovulation**

It causes the rupturing of the graafian follicle ✓ to release the ovum ✓ (2)

4.5.5 **Stage of oestrus when oestrogen is at its peak**

Oestrus stage ✓ (1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150

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