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**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2016

**AGRICULTURAL SCIENCES P1
MEMORANDUM**

MARKS: 150

This memorandum consists of 6 pages.

SECTION A**QUESTION 1**

- | | | | | |
|-----|--------|--------------------------------|----------|------|
| 1.1 | 1.1.1 | C √√ | | |
| | 1.1.2 | B √√ | | |
| | 1.1.3 | A √√ | | |
| | 1.1.4 | A √√ | | |
| | 1.1.5 | D √√ | | |
| | 1.1.6 | A √√ | | |
| | 1.1.7 | C √√ | | |
| | 1.1.8 | B √√ | | |
| | 1.1.9 | A √√ | | |
| | 1.1.10 | D √√ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | None √√ | | |
| | 1.2.2 | B only √√ | | |
| | 1.2.3 | A only √√ | | |
| | 1.2.4 | B only √√ | | |
| | 1.2.5 | Both A and B √√ | (5 x 2) | (10) |
| 1.3 | 1.3.1 | Pancreas √√ | | |
| | 1.3.2 | Stock density √√ | | |
| | 1.3.3 | Virus √√ | | |
| | 1.3.4 | Impotence √√ | | |
| | 1.3.5 | Concentration √√ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | Urea √ | | |
| | 1.4.2 | Conduction √ | | |
| | 1.4.3 | Mesoderm √ | | |
| | 1.4.4 | Posture √ | | |
| | 1.4.5 | Bulbo-urethral/Cowpers gland √ | (5 x 1) | (5) |

TOTAL SECTION A: 45**SECTION B****QUESTION 2: ANIMAL NUTRITION**

- | | | | |
|-----|-------|---|-----|
| 2.1 | 2.1.1 | Non-ruminant/monogastric √ | (1) |
| | 2.1.2 | Single/Simple stomach/Monogastric √ | (1) |
| 2.2 | 2.2.1 | C √ | (1) |
| | 2.2.2 | D √ | (1) |
| | 2.2.3 | F √ | (1) |
| | 2.2.4 | I √ | (1) |
| | 2.2.5 | E √ | (1) |
| 2.3 | 2.3.1 | It is highly soluble than biuret. √ | (1) |
| | 2.3.2 | Avoid keeping the lick in rain. √ | (1) |
| | 2.3.3 | <ul style="list-style-type: none"> • A mixture of 2 kg urea and 20 kg molasses be sprayed on grazing √ • Use of premixed fodders/mixtures/stock licks √ | (2) |

- 2.4 2.4.1
- Only abomasum is functioning ✓
 - Rumen/reticulum/omasum still underdeveloped ✓
 - Oesophagal groove transport milk to the abomasum ✓ (Any 2 x 1) (2)

2.4.2 When the calf starts eating solid food/starts grazing ✓ (1)

- 2.4.3
- Enable to digest cellulose ✓
 - Hydrolyse protein ✓
 - Synthesis of vitamins ✓
 - Synthesis of amino acids ✓ (Any 2 x 1) (2)

2.5 2.5.1 DE of 5 kg DM intake = Gross Energy – energy lost in faeces
 = 92,5 J – 42,5 J ✓
 = 50 J ✓ (2)

2.5.2 Nett energy = **Metabolic energy** – Energy lost as heat

$$\text{Metabolic energy} = 50 \text{ J} - 18,5 \text{ J} = 31,5 \text{ J} \checkmark$$

$$\begin{aligned} \text{Nett energy} &= \text{Metabolic energy} - \text{Energy lost as heat} \\ &= 31,5 \text{ J} - 9 \text{ J} \checkmark \\ &= 22,5 \text{ J} \checkmark \end{aligned}$$

NB: Learners may use different ways/formula to arrive at 22,5 J, e.g.
 NE = GE – energy lost in faeces – energy lost in urine and gases – heat loss
 OR
 NE = DE – energy lost in urine + gases – heat loss

(3)

2.6 **Percentage of feed mixture**

Ratio of Maize meal : peanut oilcake meal = 22 : 7,5

$$22 + 7,5 = 29,5 \checkmark$$

$$\begin{aligned} \% \text{ of peanut oilcake meal} &= \frac{7,5}{29,5} \times 100 \checkmark \\ &= 25,42 \% \checkmark \end{aligned} \quad (3)$$

2.7 2.7.1 Concentrate requirement = $\frac{70}{100} \times 60 \text{ kg/day}$
 = 42 kg/cow/day ✓
 = 42 kg × 30 days × 100 cows ✓
 = 126 000 kg (126 tons) ✓ (3)

2.7.2 Feed supply = 650 kg × 30 × 6 = 117 000 kg ✓
 Feed required = 100 × 60 kg × 30 = 180 000 kg p/month × 6
 = 1 080 000 kg ✓
 = Feed supply – Feed required
 = 117 000 kg – 1 080 000 kg
 = -963 000/1 000 ✓
 = -963 tons ✓ (4)

2.7.3 Not enough ✓ - pasture has a shortage of 963 tons ✓ (2)

2.8 2.8.1 Tranquillisers ✓ (1)

2.8.2 Antibiotics ✓ (1)

[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

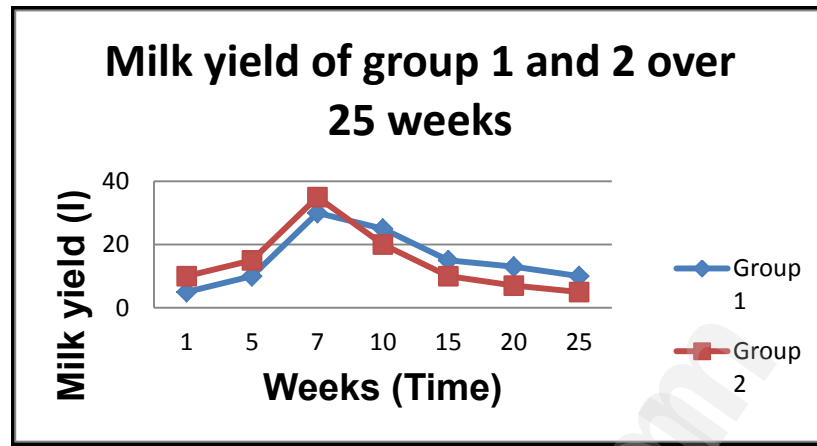
- 3.1 3.1.1 A Feeding shed ✓
B Holding pen ✓ (2)
- 3.1.2 (a) Holding pen / B ✓ (1)
(b) Feeding shed / A ✓ (1)
- 3.1.3 • Give cows time to pick up their calves before moving ✓
• Cows and calves should be moved slowly ✓
• Avoid trying to work cows and calves with dogs ✓ (3)
- 3.2 3.2.1 To warn animals of your presence ✓ (1)
- 3.2.2 Makes them feel insecure ✓ (1)
- 3.2.3 Allow animals to establish social groups ✓ (1)
- 3.3 3.3.1 D ✓ (1)
3.3.2 C ✓ (1)
3.3.3 A ✓ (1)
3.3.4 B ✓ (1)
- 3.4
- | | Subsistence | Commercial | |
|------------------|--|--|-----|
| 3.4.1 Purpose | Produce only enough to feed the family ✓ | Produce to sell for a profit ✓ | (2) |
| 3.4.2 Management | Limited as only few animals and crops produced ✓ | Intensive to ensure increased production ✓ | (2) |
- 3.5 3.5.1 **A** Chronic ✓
B Very sudden/develops within an hour/weeks ✓
C Acute ✓
D Deadly ✓ (4)
- 3.5.2 Anthrax ✓ (1)
- 3.5.3 • Burn the carcass ✓
• Do not cut open the animal carcass ✓
• Bury carcass deep in the ground ✓ (Any 2 x 1) (2)
- 3.6 3.6.1 Nasal worm ✓ (1)
- 3.6.2 (a) C ✓ (1)
(b) A/B ✓ (1)
- 3.6.3 Summer ✓ (1)
- 3.6.4 • Sneezing and nasal irritation ✓
• Yellow nasal discharge ✓
• Shaking of head to get rid of the parasite ✓ (3)

- 3.7 3.7.1 Proper hygiene standards in abattoirs ✓ (1)
- 3.7.2 Quarantine of imported animals at ports of entry ✓ (1)
- 3.7.3
- Reporting any suspicion of the disease ✓
 - Eradication programs ✓
 - Immunisation campaigns ✓
- (Any 1) (1)

[35]**QUESTION 4: ANIMAL REPRODUCTION**

- 4.1 4.1.1 Embryo transfer ✓ (1)
- 4.1.2
- Prostaglandin injection ✓
 - Gonadotropin - release hormone ✓
- (2)
- 4.1.3 **A** Donor ✓ (1)
- 4.1.4 37 °C ✓ (1)
- 4.1.5
- (a) Their reproductive cycle is extended to produce more progeny ✓ (1)
- (b) More profit from selling superior animals ✓ (1)
- 4.2 4.2.1
- A** Oestrus ✓
- B** Di-oestrus ✓
- C** Met-oestrus ✓
- D** Pro-oestrus ✓
- (4)
- 4.2.2
- (a) A ✓ (1)
- (b) C ✓ (1)
- 4.3 4.3.1
- B** vas deference ✓
- D** scrotum ✓
- F** seminal vesicle ✓
- (3)
- 4.3.2
- Hypoplasia ✓
 - Cryptorchidism ✓
 - Sperm defects ✓
- (Any 2 x 1) (2)
- 4.4 4.4.1 Exhaustion/Fatigue ✓ (1)
- 4.4.2 Malnutrition ✓ (1)
- 4.4.3 Lack of experience ✓ (1)
- 4.4.4 Temperament ✓ (1)

4.5 4.5.1



Marking graph with the following checklist:

Criteria	Yes: 1 mark	No: 0 mark
1 Line graph	1	0
2 Y-axis labelled	1	0
3 X-axis labelled	1	0
4 Points correctly labelled in group 1 and group 2	1	0
5 Correct heading	1	0
6 Units (and time)	1	0

(6)

4.5.2 Milk yield increases drastically in week 7 and drops from week 15 to week 20. ✓

OR

For both groups milk yield increases from week 1 to week 7 and then it decreases after week 7 until week 25.

(1)

- 4.6 4.6.1 C ✓ allantois ✓ (2)
- 4.6.2 F ✓ placenta ✓ (2)
- 4.6.3 B ✓ chorion/embryonic sac ✓ (2)
- [35]**

TOTAL SECTION B: 105
GRAND TOTAL: 150