

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2025

AGRICULTURAL SCIENCES PAPER 1 MARKING GUIDELINE

MARKS: 150

This marking guideline consists of 12 pages.

SECTION A**QUESTION 1**

- 1.1 1.1.1 A ✓✓
1.1.2 C ✓✓
1.1.3 D ✓✓
1.1.4 C ✓✓
1.1.5 C ✓✓
1.1.6 B ✓✓
1.1.7 D ✓✓
1.1.8 A ✓✓
1.1.9 A ✓✓
1.1.10 B ✓✓ (10 x 2) (20)
- 1.2 1.2.1 Both A and B ✓✓
1.2.2 A only ✓✓
1.2.3 B only ✓✓
1.2.4 Both A and B ✓✓
1.2.5 A only ✓✓ (5 x 2) (10)
- 1.3 1.3.1 Net energy/ NE ✓✓
1.3.2 Mite ✓✓
1.3.3 Pedometer ✓✓
1.3.4 Freemartin ✓✓
1.3.5 Colostrum ✓✓ (5 x 2) (10)
- 1.4 1.4.1 Molasses ✓
1.4.2 Commercial ✓
1.4.3 Metritis ✓
1.4.4 Dystocia ✓
1.4.5 Sterility ✓ (5 x 1) (5)

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Stomachs of a farm animal.****2.1.1 Stomach classification**

Ruminant ✓

(1)

2.1.2 Collective name for stomachs in the pictures

Fore stomachs ✓

(1)

2.1.3 Identification of the stomachs with the LETTERS.

(a) A ✓

(1)

(b) C ✓

(1)

(c) B ✓

(1)

2.1.4 Stomach parts regarded as true stomachs.

(a) Abomasum ✓

(1)

(b) Proventriculus ✓

(1)

2.1.5 Reason for regarding them as true stomachs.

- Secretes gastric juices ✓
- Chemical digestion occurs there ✓

(Any 1) (1)

2.2 Types of feeds**2.2.1 Feeds classification in PICTURES A and B****PICTURE A** - Roughage ✓

(1)

PICTURE B - Concentrate ✓

(1)

2.2.2 Identification of appropriate feed.

(a) A ✓

(1)

(b) B ✓

(1)

(c) B ✓

(1)

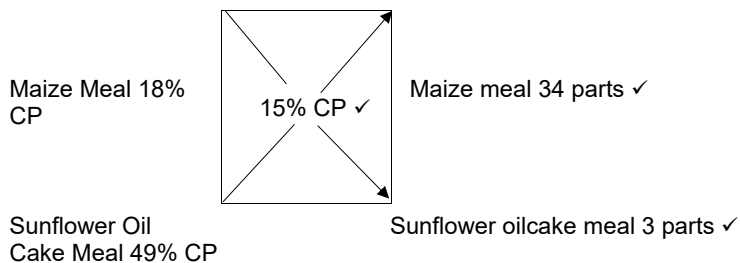
2.3 Balancing a ration

2.3.1 Method used by farmers to balance rations.

Pearson square ✓

(1)

2.3.2 Calculation of the ratio to balance a ration



Ratio of Maize meal: Sunflower oilcake meal is 34 : 3 ✓

(4)

2.3.3 Cost of maize in a ton of the ration

Cost of maize meal = $34/37 \times 1\,000\text{kg} = 918,9\text{ kg}$ ✓
 $= 918,9\text{kg}$ ✓
 $= (\text{R}3\,500 \times 918,9)/1\,000$ ✓
 $= \text{R}3\,216,15$ ✓

(4)

2.4 Feeding program

2.4.1 Nutritive ratio (NR) for feed B

% TDN – % DP = % NPN
 $78 - 13 = 65$ ✓

NR = 1 : $\frac{\% \text{ digestible non-nitrogen nutrients}}{\% \text{ digestible protein}}$ ✓
 $= 1 : \frac{65}{13}$
 $= 1 : 5$ ✓

(3)

2.4.2 Feed type that will be most suitable to raise heifers.

Feed B ✓

(1)

2.4.3 Justification of answer to QUESTION 2.4.2

NR is less than 1 : 6/ narrow NR ✓ which means the feed is rich in proteins ✓ which are required for growth ✓

(3)

2.5 Matching of supplement with given statement**2.5.1 Thyroid regulators**

Growth stimulants ✓

(1)

2.5.2 Intake controlled by salt concentration

Non-protein nitrogen (NPN) ✓

(1)

2.5.3 Injections mixed in drinking water and supplementary rations

Minerals ✓

(1)

2.6 Biological value (BV)**2.6.1 Ideal protein with 100 BV**

Egg protein ✓

(1)

2.6.2 Explanation of not feeding ruminants with high BV protein

Rumen microbes can convert protein of low BV to high BV ✓

(2)

[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL**3.1 Production systems****3.1.1 Identification of production system****PICTURE A** – Intensive ✓

(1)

PICTURE B – Extensive ✓

(1)

3.1.2 Comparison of production systems in the pictures A and B

FACTORS	PICTURE A	PICTURE B	
Labour	Labour intensive/ high labour use ✓	Less labour input ✓	(2)
Output	Large ✓	Small ✓	(2)

3.1.3 TWO equipment controlling environmental conditions in PICTURE A

- Insulation ✓
- Ventilation ✓
- Heating ✓
- Fans ✓
- Air conditioners ✓

(Any 2) (2)

3.2 Animal shelter**3.2.1 Structure in the picture**

Feed shed ✓

(1)

3.2.2 TWO shelter requirements guidelines

- Size should accommodate the number of cows ✓
- Proper roof ✓
- Should be close to the milking parlour ✓
- Ensure that the construction of the room will keep rats and mice out ✓
- Entrance must be locked to prevent theft ✓

(Any 2) (2)

3.3 Equipment used in the intensive housing system**3.3.1 Equipment in A and B****A** – Nipple drinkers ✓

(1)

B – Feeders ✓

(1)

Commented [HM1]: These should be in different lines.

3.3.2 Type of lighting specially designed for livestock

Fluorescent ✓

Infrared light ✓

(Any 1) (1)

3.4 Animal behaviour**3.4.1 Points labelled A and B**

A – Flight zone ✓

(1)

B – Blind spot ✓

(1)

3.4.2 Point of balance

D ✓

(1)

3.4.3 TWO consequences of approaching an animal from direction B.

• The animal lashes out/injures the handler ✓

• The animal flees ✓

• The animal is startled ✓

(Any 2) (2)

3.4.4 ONE abnormal behaviour shown by pigs when under stress.

• Tail biting ✓

• Cannibalism ✓

• Belly nibbling ✓

• Snout rubbing ✓

• Hyperactivity ✓

(Any 1)

3.5 Animal health**3.5.1 Methods of testing animal health****A** – Taking animals temperature ✓

(1)

B – Checking animal pulse rate ✓

(1)

3.5.2 Method of administering medication in PICTURE C

Injection ✓

(1)

3.5.3 TWO other methods of medicine administration.

Topical application ✓

Oral administration ✓

Drenching ✓

Mixing with food ✓

Dipping/ foot/ belly dips/ spray race ✓

(Any 2) (2)

3.5.4 Distinction between chronic and per acute levels of seriousness in animal disease

Chronic – long-lasting, recurring repeatedly ✓

Per acute – severe symptoms and sudden in onset ✓

(2)

3.6 Animal diseases**3.6.1 Classification of the disease**

Protozoan ✓

(1)

3.6.2 Disease caused by the infestation

Heart water ✓

(1)

3.6.3 TWO symptoms displayed by an infected animal

- Uncoordinated movements ✓
- Diarrhoea ✓
- Nervousness ✓
- Listlessness ✓
- Difficulty breathing ✓

(Any 2) (2)

3.6.4 TWO economic implications of animal diseases

- Poor production/Decreased production ✓
- High treatment costs ✓
- Export bans on animals and animal products ✓
- Loss of profit/income ✓
- Death of livestock ✓
- Loss of jobs ✓

(Any 2) (2)

3.6.5 TWO control measures for animal disease

- Isolation of sick animals to prevent the spread of diseases ✓
- Strict hygiene and sanitary measures ✓
- Breed animals resistant to diseases ✓
- Control of external parasites/dipping ✓
- Provide well balanced nutrition to strengthen animal immune system ✓
- Ensure good herd management with good health programme suitable to the area where animals are kept. ✓

(Any 2) (2)

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QUESTION 4: ANIMAL REPRODUCTION**4.1 Reproductive organs of a farm animal****4.1.1 Parts labelled C, D and E**

C – Urethra ✓ (1)

D – Testes ✓ (1)

E – Scrotum ✓ (1)

4.1.2 LETTER indicating the answer

(a) **Nourishes the sperm cells**
A ✓ (1)

(b) **Regulates the temperature of a primary reproductive organ in the male animal**
E ✓ (1)

(c) **Allows the spermatozoa to mature**
B ✓ (1)

4.1.3 Congenital defect in C

Hypoplasia ✓
Cryptorchidism ✓ (Any 1) (1)

4.2 Oestrus cycle**4.2.1 Identification of stages B and D in the diagram**

B – Oestrus ✓ (1)

D – Di-oestrus ✓ (1)

4.2.2 Motivation for answers B and D

Oestrus is the shortest stage ✓ while Di-oestrus is the longest stage ✓ (2)

4.2.3 TWO behavioural signs of oestrus

- Increased restlessness and activity ✓
- Vocalisations (like bellowing or grunting) ✓
- Mounting or attempting to mount other animals, ✓
- A swollen, reddened vulva with mucus discharge ✓ (Any 2) (2)

4.2.4 Identification of oestrus stage

- (a) A ✓ (1)
(b) D ✓ (1)

4.3 Procedure in animal reproduction**4.3.1 Identification of procedure**

Artificial insemination ✓ (1)

4.3.2 Name of tool used to perform the procedure

Pistolette ✓ (1)

4.3.3 TWO requirements for a successful artificial insemination

- Correct timing ✓
 - Correct insemination technique ✓
 - Use of healthy, viable and disease free semen. ✓
 - Use of sterile equipment ✓
- (Any 2) (2)

4.3.4 Best time to inseminate cows

12 hours after ✓ standing heat ✓

OR

In the morning after the cow has shown signs of oestrus in the afternoon. ✓ (2)

In the afternoon after the cow has shown signs of oestrus in the morning. ✓

4.4 Reproduction procedure

4.4.1 Procedure in the diagram above

Embryo transfer ✓

(1)

4.4.2 Animals in labels A and C

A – Donor cow ✓

(1)

C – Recipient cow/surrogate cows ✓

(1)

4.4.3 Process taking place in B

Superovulation ✓

(1)

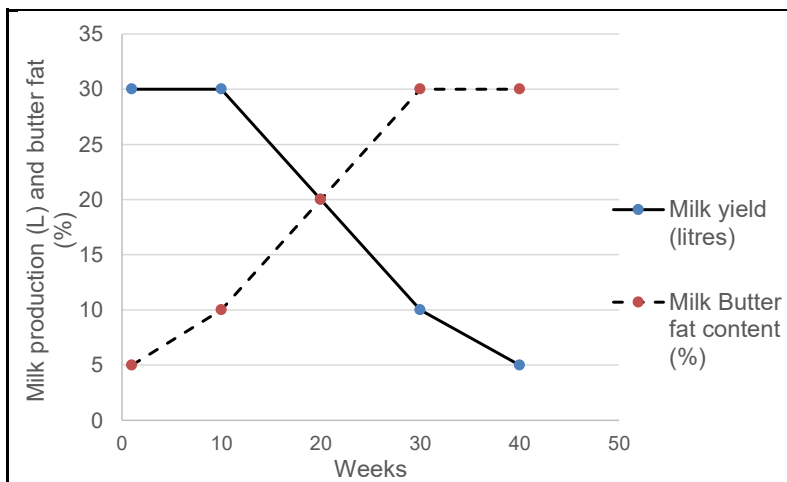
4.4.4 Justification for embryo transfer use by farmers

- It allows for the rapid multiplication of offspring from genetically superior cows ✓
- Increases the selection intensity for female herd replacements ✓
- Can improve the overall genetic merit of a herd ✓

(Any 2) (2)

4.5 Milk production

4.5.1 Milk production and butter fat content over a lactation period



Criteria/rubric/marketing guidelines

- Correct heading ✓
 - X-axis – correctly calibrated and labelled (Weeks) ✓
 - Y-axis – correctly calibrated and labelled (milk yield and butter fat) ✓
 - Correct units (litres and %) ✓
 - Accuracy (80%+ correct plotting) ✓
 - Graph type (Line graph) ✓
- (6)

4.5.2 Graph trend

When milk production is at its highest, ✓ the butter fat is at its lowest and vice versa. ✓

OR

Butterfat is inversely proportional ✓ to milk production. ✓

(Any 2) (2)
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TOTAL SECTION B: 105
GRAND TOTAL: 150