



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**SEPTEMBER 2020**

**AGRICULTURAL SCIENCES P1  
MARKING GUIDELINE**

**MARKS: 150**

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This marking guideline consists of 9 pages.

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**SECTION A****QUESTION 1**

1.1	1.1.1	B ✓✓		
	1.1.2	D ✓✓		
	1.1.3	A ✓✓		
	1.1.4	C ✓✓		
	1.1.5	C ✓✓		
	1.1.6	B ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	A ✓✓		
	1.1.10	B ✓✓	(10 x 2)	(20)
1.2	1.2.1	None ✓✓		
	1.2.2	Both A and B ✓✓		
	1.2.3	B only ✓✓		
	1.2.4	A only ✓✓		
	1.2.5	A only ✓✓		(10)
1.3	1.3.1	Maintenance ration ✓✓		
	1.3.2	Vaccination/immunisation ✓✓		
	1.3.3	Corpus luteum/yellow body ✓✓		
	1.3.4	Ejaculation ✓✓		
	1.3.5	Prolactin ✓✓		(10)
1.4	1.4.1	Essential amino acids ✓		
	1.4.2	Contagious/infectious ✓		
	1.4.3	Di-oestrus ✓		
	1.4.4	Vas deferens ✓		
	1.4.5	Prolapse ✓		(5)

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canal of a farm animal****2.1.1 Indication of the age of animals****Diagram A** – Young animal/calf ✓**Diagram B** – Adult animal ✓

(2)

**2.1.2 Reason visible in diagram A and diagram B to justify the answer****Diagram A**

- Presence of oesophageal groove ✓
- Under-developed rumen/reticulum/omasum ✓
- Fully developed abomasum ✓

(Any 1) (1)

**Diagram B**

- Rumination process/regurgitation ✓
- Developed rumen/reticulum/omasum ✓

(Any 1) (1)

**2.1.3 Identification of the processes****Arrow A** – Swallowing ✓**Arrow B** – Regurgitation ✓

(2)

**2.1.4 Explanation of the importance of regurgitation in digestion**

- Regurgitation breaks down food into smaller particles ✓ to increase the surface area for digestion ✓

(2)

**2.1.5 Difference of part F/caeca with that of a pig**

- A pig has one caecum ✓

(1)

**2.1.6 Identification of the letter**

- D ✓

(1)

**2.2 Mineral deficiency symptoms/supplementation and type of animal****Writing the missing information**

A – Calcium ✓

B – Iron ✓

C – Soil sods/injection ✓

D – Mineral lick ✓

(4)

**2.3 Nutritional composition of feeds****2.3.1 Classification of feeds**

Concentrates ✓

(1)

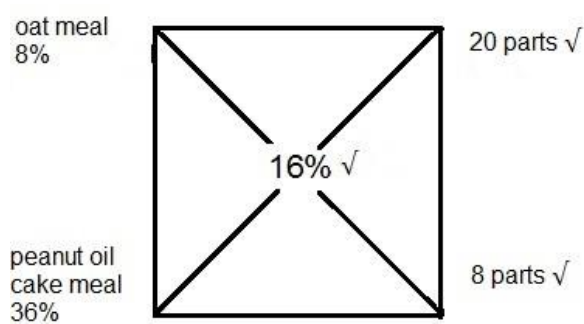
**2.3.2 TWO importance of feeding animals with concentrates**

- Provides energy and protein requirements of an animal ✓
- Necessary for fattening/finishing animals ✓
- For the production of protein rich products ✓
- To balance roughage ✓
- Essential for growth ✓

(Any 2 x 1) (2)

**2.3.3 Identification of the feed****(a) Wide nutritive ratio:** Oat meal ✓**(b) Narrow nutritive ratio:** Peanut oilcake meal ✓

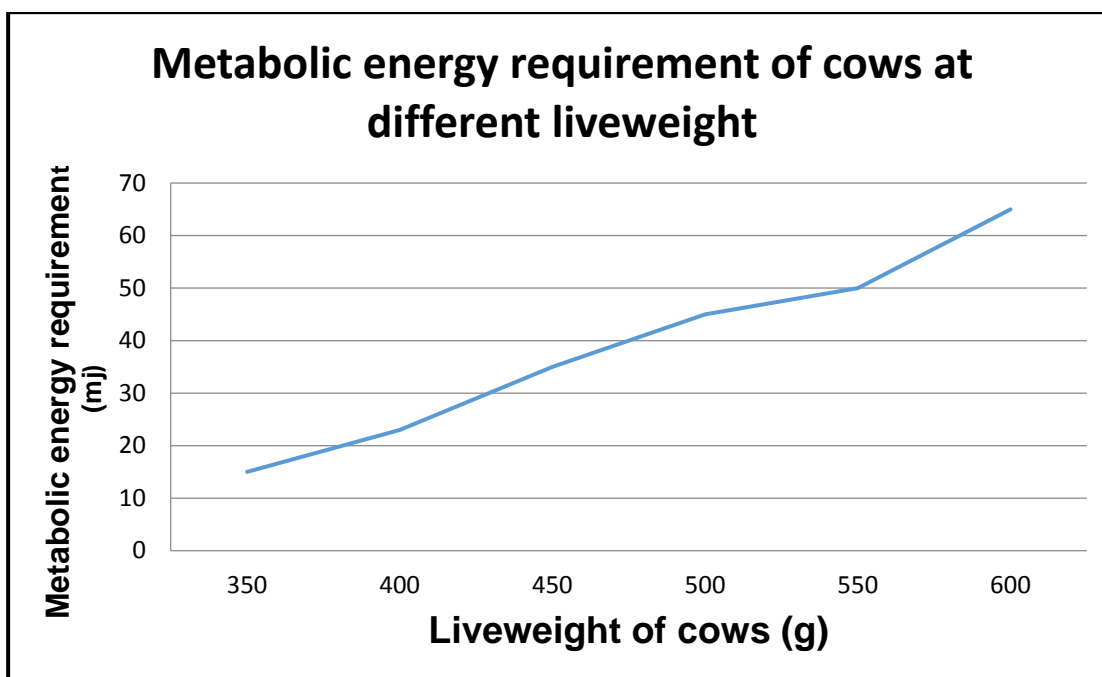
(2)

**2.3.4 Calculation of the ratio of each feed to get the 16% DP**

Ratio of oatmeal to peanut oilcake meal is 20 : 8 ✓

(4)

## 2.4 2.4.1 Line graph

**Criteria/rubric/marketing guideline**

- Correct heading ✓
- X-axis: Correctly calibrated and labelled (Live weight) ✓
- Y-axis: Correctly calibrated and labelled (Metabolic energy requirement) ✓
- Line graph ✓
- Accuracy ✓
- Correct units (Mj/g) ✓ (6 x 1) (6)

**2.4.2 Deduction of the trend of metabolic requirement per live weight of a cow**

- Metabolic energy requirement increases ✓ with the increase in live weight ✓ (2)

**2.4.3 Calculation of the metabolic energy requirement of a cow with a live weight of 400 kg in 5 days**

Metabolic energy requirement x number of days  
 = 23 mJ/day x 5 days ✓  
 = 115 mJ ✓ (2)

**2.4.4 TWO importance of calculating energy value of a feed**

- To determine animal's diet ✓
- To determine feeding standards ✓
- To determine ration formulation ✓ (Any 2 x 1) (2)

**QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Animal handling****3.1.1 Identification of the picture**

- (a) Picture C ✓
  - (b) Picture D ✓
  - (c) Picture B/C ✓
  - (d) Picture A ✓
- (4)

**3.1.2 Indication of how the techniques are used**

- (a) Hobbling – Tying an animal with a device such as rope to hamper its ability to walk ✓
  - (b) Immobilising – Put an electric current through their body to prohibit movement ✓
- (2)

**3.2 Factors to increase production****3.2.1 Indication of the production system**

- Intensive production system ✓
- (1)

**3.2.2 Identification of the factors to increase production**

- A – General enterprise management ✓
  - B – Breeding/reproduction ✓
  - C – Nutrition/feeding ✓
- (3)

**3.2.3 ONE factor to increase production which is not illustrated**

- Environment ✓
- (1)

**3.2.4 Indication of the way farmers can address the environment**

- Provision of housing/shelter ✓
- (1)

**3.3 Animal behaviour****3.3.1 Type of animal showing the behaviour**

- A – Pigs ✓
  - B – Cattle ✓
  - C – Poultry ✓
  - D – Sheep ✓
- (4)

**3.3.2 THREE signs of pigs under stress**

- Tail biting ✓
  - Ear biting ✓
  - Cannibalism ✓
  - Belly nibbling ✓
  - Snout rubbing ✓
- (Any 3 x 1) (3)

**3.4 Life cycle of a parasite****3.4.1 Classification of the parasite – External parasite ✓****Name – Blowfly ✓****(2)****3.4.2 Type of an animal susceptible to the parasite**

- Wool sheep ✓

**(1)****3.4.3 THREE stages of the life cycle of a parasite visible in the picture**

- Larvae ✓
- Pupae ✓
- Adult ✓

**(3 x 1) (3)****3.4.4 ONE precautionary measure to prevent the infestation by the parasite.**

- Timing of shearing and crutching ✓
- Clipping and cleaning of coat around the affected area ✓
- Tail docking ✓

**(Any 1 x 1) (1)****3.5 Animal diseases****3.5.1 Disease that can be transmitted by each of the following methods**

- (a) Transmitted by a bont tick – Heart water ✓
- (b) Transmitted by contaminated shearing equipment – Lumpy wool ✓
- (c) Ingesting eggs from feed contaminated with manure – Coccidiosis ✓
- (d) Transmitted through inhalation – Bovine tuberculosis ✓

**(4)****3.5.2 Indication of a non-infectious disease****Anaemia ✓****(1)****3.6 Indication of where the practice to control disease is the role of state or the farmer****3.6.1 Application of prescribed medication****Farmer ✓****(1)****3.6.2 Importation of vaccines****State ✓****(1)****3.6.3 Ensuring proper sanitation in a milking parlour****Farmer ✓****(1)****3.6.4 Export and import bans****State ✓****(1)****[35]**

**QUESTION 4: ANIMAL REPRODUCTION****4.1 Reproductive system****4.1.1 Identification of the animal with the reproductive system**

- Cow ✓ (1)

**4.1.2 TWO reasons visible to support the answer**

- Presence of ovary ✓
- Presence of fallopian tubes ✓
- Presence of cervix ✓
- Presence of the vagina ✓ (Any 2 x 1) (2)

**4.1.3 Identification of the letter**

- (a) D ✓
- (b) C ✓
- (c) B ✓ (3)

**4.1.4 TWO hormones produced in part labelled D/ovary**

- Oestrogen ✓
- Progesterone ✓ (2)

**4.2 Infertility and sterility in bulls****4.2.1 Differentiation between sterility and infertility**

Sterility is the total loss of fertility ✓ and infertility is the temporal loss of fertility ✓ (2)

**4.2.2 TWO congenital defects leading to sterility in bulls**

- Hypoplasia ✓
- Cryptorchidism ✓
- Hermaphroditism ✓
- Sperm defects ✓ (Any 2 x 1) (2)

**4.2.3 TWO conditions that may cause inability of a bull to copulate**

- Injuries to the penis ✓
- Defective penis/corkscrew/too short ✓
- Poorly developed hind legs ✓
- Diseases causing inflammation of the joints ✓ (Any 2 x 1) (2)

**4.3 Semen collection, dilution and storage****4.3.1 TWO requirements for semen collection**

- Equipment must be sterile and readily available ✓
- Bull must be clean during semen collection ✓
- Collecting vial must be warmed to prevent damage to sperm cells caused by cold shock ✓
- Area where semen is collected must be close to a laboratory ✓
- Presence of a teaser bull ✓ (Any 2 x 1) (2)

**4.3.2 Indication of the main purpose for diluting the semen**

- To increase the volume of the semen ✓ (1)

**4.3.3 TWO advantages of storing semen for the farmer**

- Extending the productive life of superior bulls ✓
- No need to keep and maintain expensive bulls ✓ (2)



**4.4 Embryo Transplant/transfer****4.4.1 Re-arranging the steps to ensure successful embryo transfer**

- Treatment of the cow with the gonadotropin hormone ✓
  - Semen is placed into the reproductive tract of a cow ✓
  - Foley catheter is used to recover the embryo ✓
  - Isolation and classification of the embryo ✓
  - Transfer of embryo to the uterus of a cow ✓
- (5)

**4.4.2 TWO types of cows involved in embryo transplant**

- Donor ✓
  - Surrogate/recipient ✓
- (2)

**4.4.3 TWO disadvantages of the embryo transplant**

- It is expensive ✓
  - Requires skill and experience ✓
  - Synchronisation of the recipient and donor is difficult ✓
  - Donor may not become pregnant ✓
  - Recipient cow could abort ✓
  - Labour intensive ✓
  - Time consuming ✓
  - Decreases genetic variability ✓
  - Greater management demand ✓
- (Any 2 x 1) (2)

**4.5 Normal lactation****4.5.1 Identification of the week when the cow reached her maximum production**

Week 8 ✓ (1)

**4.5.2 TWO benefits of the milk produced within the first 3 days of parturition for the calf**

- It provides antibodies to increase the calf's resistance to diseases ✓
  - Supplies nutrients to the calf ✓
  - Necessary for the normal growth, functioning and maturation of the alimentary canal ✓
- (Any 2 x 1) (2)

**4.5.3 Explanation of the relationship between the percentage of butter fat content and quantity of milk produced**

When milk production reached its maximum during week 8 and decreased until week 42 ✓ butterfat content decreased at week 8 and increased until week 42. ✓ (2)

**4.5.4 Period in lactating cow after 42 weeks**

Dry period ✓ (1)

**4.5.5 Importance of dry period**

It gives the glandular tissue of the udder time to recover. ✓ (1)

**[35]**

**TOTAL SECTION B: 105**  
**GRAND TOTAL: 150**