education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2009

MEMORANDUM

MARKS: 150

This memorandum consists of 9 pages.

SECTION A

QUESTION 1.1

1.1.1	**X✓✓**	**B**	**C**	**D**
1.1.2	**A**	**B**	**C**	**X✓✓**
1.1.3	**A**	**B**	**C**	**X✓✓**
1.1.4	**A**	**B**	**C**	**X✓✓**
1.1.5	**X✓✓**	**B**	**C**	**D**
1.1.6	**A**	**B**	**X✓✓**	**D**
1.1.7	**A**	**B**	**C**	**X✓✓**
1.1.8	**A**	**X✓✓**	**C**	**D**
1.1.9	**A**	**B**	**X✓✓**	**D**
1.1.10	**A**	**B**	**X✓✓**	**D**

(10 x 2) (20)

QUESTION 1.2

	ONLY A	**ONLY B**	**A and B**	**NONE**
1.2.1				**X✓✓**
1.2.2	**X✓✓**			
1.2.3			**X✓✓**	
1.2.4	**X✓✓**			
1.2.5		**X✓✓**		

(5 x 2) (10)

QUESTION 1.3

1.3.1 Abomasum ✓✓

1.3.2 Villus ✓✓

1.3.3 Feedlot/Intensive farming/Intensive production ✓✓

1.3.4 Cryptorchidism ✓✓

1.3.5 Docking ✓✓ (5 x 2) (10)

QUESTION 1.4

1.4.1 Protein ✓

1.4.2 Nutritional ✓

1.4.3 Shelter/Housing ✓

1.4.4 Precision ✓

1.4.5 Pregnancy/Gestation ✓

(5 x 1) (5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2

2.1 Digestive system of ruminants

2.1.1 Diagram 1 ✓ **and**
The compartments of the stomach A, B and C are underdeveloped ✓
D is well developed ✓
(Any 1) (2)

2.1.2

Diagram 1	Diagram 2
A	E✓
B	F✓
C	G✓
D	H✓

(4)

2.1.3 I – oesophagus/gullet ✓
J – small intestine/duodenum ✓ (2)

2.1.4 Diagram 2/E/rumen ✓
Rumen/reticulo-rumen is well developed and large (great volume) ✓
to cater for the bulky and fibrous roughages ✓
formed like a fermentation organ or vessel ✓
and is ideal for microbe/bacteria/protozoa activity ✓
has a warm and moist environment ✓ (Any 4) (4)
[12]

2.2 Energy loss in animal body

2.2.1 A – Digestible energy ✓
C – Energy lost in heat ✓ (2)

2.2.2 **Importance of nett energy value of a feed**
It shows how much energy is directly available to the animal for:
- Maintenance ✓
- Growth ✓
- Production ✓ (3)

2.2.3 Lipids have a high gross energy level and would increase the gross energy value ✓
because they do not contribute greatly to the formation of faeces and fermentation gases ✓
so less energy is lost ✓ (Any 2) (2)

2.2.4 Monogastric animals ✓
They lose less energy ✓
in faeces and fermentation gases ✓ (3)
[10]

2.3 **Lucerne as a feed to livestock**

2.3.1 Protein rich ✓
Roughage ✓ (2)

2.3.2 Hay – Dry content: 7 kg – 0,56 = 6,44 kg
Manure – Dry content: 2 kg – 0,08 = 1,92 kg

$$= \frac{\text{Dry matter intake (kg) – Dry mass of manure}}{\text{Dry matter intake}} \times \frac{100}{1}\ ✓$$

$$= \frac{(7\text{ kg} – 0{,}056\text{ kg}) – (2\text{ kg} – 0{,}08\text{ kg})}{6{,}44}\ ✓ \times \frac{100}{1}$$

$$= \frac{6{,}44 – 1{,}92}{6{,}44} \times \frac{100}{1}\ ✓ \quad \textbf{OR} \quad = \frac{4{,}52}{6{,}44} \times \frac{100}{1}\ ✓$$

= 70,1% ✓ (4)

2.3.3 Younger sheep need proteins mainly for growth ✓
while older sheep need proteins for production and reproduction✓ (2)

2.3.4 **Suitability of lucerne hay**
- Easy for sheep (ruminant) to digest ✓
- It is palatable ✓
- Rich in proteins ✓
- Rich in calcium ✓
- Rich in vitamins A and D ✓
- Contains cobalt and potassium that stimulate microbial activities ✓ (Any 2) (2)

2.3.5 **THREE ways to improve digestibility of lucerne hay**
- Grinding ✓
- Pelleting ✓
- Soaking ✓
- Milling ✓
- Chopping/cutting ✓ (Any 3) (3)

[13]
[35]

QUESTION 3

3.1 **Animal production**

3.1.1 Nkomani feedlot ✓ (1)

3.1.2 Sondela feedlot: ✓
The total cost was the lowest (78 compared to 81) and ✓
The production output was the highest (72 compared to 68) ✓ (3)

3.1.3 **The most efficient way to improve**
- Genetic improvement and breeding ✓ (1)

3.1.4 Temperature/Light/Humidity/Wind/Nutrition/feeding ✓ (Any 1) (1)

3.1.5 A specialised breeding program/Inbreeding/Cross-breeding/ Upgrading will increase the genetic potential of the herd ✓ (1)
[7]

3.2. **Dairy farming**

3.2.1 Suitable/favourable/conducive/ideal temperature for maximum production ✓ (1)

3.2.2
- Low temperature will increase food intake to maintain a constant body temperature (heat) ✓
- High temperature leads to a lower intake of food as the animal needs less energy to maintain its body temperature / animal is uncomfortable and eats less ✓ (2)

3.2.3 **TWO possible measures to control high temperature**
- Shelter ✓
- Ventilation ✓ (2)
[5]

3.3 **THREE requirements for transporting animals**
- Big and strong vehicles/adapted vehicles for transportation/strong sides ✓
- Enough space for animals ✓
- Correct documentation for the transport of livestock ✓
- Animals should be marked as prescribed by regulations ✓
- Animals of same sex and age transported together ✓
- Sufficient protection ✓
- Provision of drinking water/a calm area prior to departure ✓ (Any 3) (3)

3.4 Inspection by organic farmers' association

3.4.1 The reasons for inspection of a farmer by organic association

To make sure that the farmer meets the requirements for being a registered member of the association ✓ (1)

3.4.2 Five criteria for organic farming

- Irrigation water should be free from inorganic minerals like sodium, potassium, boron etc ✓
- Fertilisation is done with organic fertilisers e.g. compost/ farm manure ✓
- Weed control is done biologically without any herbicides ✓
- Pest and disease are controlled biologically ✓
- The produce (milk) is supplied to consumers that deal with organic products e.g. Woolworths ✓
- No growth stimulants added into rations e.g. hormones/ antibiotics ✓
- No supplements of mineral licks, only animal products like bone meal or carcass meal✓ (Any 5) (5)

3.4.3 Necessity for registration with the association

- To ensure that the products have a relevant market ✓
- To ensure that the produce (milk) supplied to consumers (Woolworths) meets the criteria ✓
- Dairy farmer will be supplied with relevant and new information as well as technology ✓
- The association will ensure/strengthen the negotiating power of the organic dairy producer ✓ (Any 2) (2)

3.4.4 TWO advantages of organic farming

- There is no more pollution of the environment with poisonous chemicals/the use of ecologically friendly methods and substances to improve soil and control pests ✓
- The produce is sold at a higher price ✓
- The higher price for the produce will make his/her dairy farming more profitable ✓
- Milk is free of contaminants (additives such as chemicals, antibiotics and hormones) ✓
- Farmer and workers enjoy healthier working conditions✓

(Any 2) (2)
[10]

3.5 **Natural grazing**

3.5.1 July ✓
- No rainfall in winter ✓
- Too low temperatures for growth ✓ (3)

3.5.2 TWO observations of pasture conditions
- Colour of grazing/green highly nutritious/age of plants ✓
- Volume of grazing/size of plants✓
- Type of dominant plants/permanent plants/annual plants ✓
- Cover density/damage to grazing plants ✓ (Any 2) (2)

3.5.3 Summer✓
because the nutritive value is high during summer ✓ (2)

3.5.4 Early winter months (May – Sept.) ✓ (1)

3.5.5 When the nutritional value of the pasture starts to drop ✓✓ (2)
[10]
[35]

QUESTION 4

4.1 **Animal disease carriers**

4.1.1 Ticks are parasites that have toxins and pathogens in their salivary glands ✓
When ticks suck blood these pathogens (toxins and bacteria) are transmitted ✓ (2)

4.1.2 **Control measures to restrict infectious diseases**
- Work closely with veterinarians ✓
- Apply strict health measures on the farm (clean housing and clean fresh water)/sanitation ✓
- Isolate sick animals ✓
- Destroy carcasses, skins and other material from infected animals ✓
- Strict control of pests or parasites ✓
- Provide proper nutrition ✓
- Quarantine of sick animals ✓ (Any 3) (3)
[5]

4.2 Fertilisation and embryo development

4.2.1 Oestrogen ✓
Ovulation ✓ (2)

4.2.2 B/fallopian tube/oviduct ✓ (1)

4.2.3 **TWO functions of membranes around the embryo**
- For nutrition/gases/antibodies ✓
- For protection against shock ✓
- For excretion/waste products ✓ (Any 2) (2)

4.2.4 **Causes of termination of pregnancy**
- Infections ✓
- Allergies ✓
- Poison/Toxin ✓
- Malnutrition/Incorrect feeding ✓
- Diseases ✓
- Vaccines ✓
- Injuries
- Hormonal disturbances ✓ (Any 2) (2)

4.2.5 **Visible signs of approaching parturition**
- Isolation ✓
- Stops eating ✓
- Making bellowing noises ✓
- Urinates and defaecates often ✓
- Ligaments of tail area, pelvis, vagina and cervix relax ✓
- Vulva enlarges/swollen ✓
- Strings of mucus appear ✓
- Udder becomes swollen and leak milk ✓
(Any 2) (2)
[9]

4.3 Life cycle of animal pests

4.3.1 The pest will affect the human alimentary canal/human health (nutrition) ✓
The animal health (market value) will be affected ✓
The quality of meat will be negatively affected ✓
Mechanical damage on the digestive system as it destroys some tissues and organs/cause wounds ✓
Damage to the digestive capacity in both animals since the pests destroy tissue (cells) secreting gastric juices✓
Depletive damage as it absorbs nutrients required by the host ✓
(3)
(Any 3)

4.3.2 The animal will get the pest through grazing/infected pasture ✓ (1)

4.3.3 Man (humans) ✓ and cattle ✓ (2)

4.3.4 Meat is inspected before consumption ✓ (1)

4.3.5 Dosing/Drenching/Premixes (worm remedy mixed into feed)/Pastes (remedies smeared onto the tongue)/Injections (remedies that are injected)/Lick blocks (that contain remedies) ✓
The tapeworm is an internal parasite ✓ (2)

4.3.6 Beef measles tapeworm/*Taenia saginata*/Tapeworm ✓ (1)
[10]

4.4

Battery system	Free-range system
Chickens are protected from contact with other chickens and humans ✓	Chickens are allowed to utilise the space freely ✓
Chickens are protected in an enclosed environment ✓	Chickens are exposed to the sunlight and other environmental conditions ✓
Disease prevention is emphasised at all levels of the operation ✓	Chickens are more exposed to diseases ✓
Sterilisation of cages and shelter is carefully done and monitored ✓	Manure and other material is left on the soil surface ✓
All layers receive vaccines and remedies simultaneously ✓	Chickens are treated for diseases as necessary ✓
Receive additions in their food ✓	Receive only food and roam the area where they are kept ✓
Separate food is provided for batches ✓	They supplement their food with vegetation and things they pick from the soil ✓

(Any 3 from each column)

(6)

4.5 **Mineral deficiency diseases**

4.5.1 Vitamin B_2 ✓ (1)

4.5.2 Vitamin D ✓ (1)

4.5.3 Vitamin A ✓ (1)

4.5.4 Vitamin K ✓ (1)

4.5.5 Vitamin D ✓ (1)
[5]
[35]

TOTAL SECTION B: 105

GRAND TOTAL: 150