

**AGRICULTURAL SCIENCES
COMMON TEST
JUNE 2014
MEMORANDUM**

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MARKS: 150

TIME : 2½ hours

This memorandum consists of 9 pages.

SECTION A**QUESTION 1****1.1**

1.1.1 C ✓✓

1.1.2 B ✓✓

1.1.3 C ✓✓

1.1.4 A ✓✓

1.1.5 B ✓✓

1.1.6 A ✓✓

1.1.7 C ✓✓

1.1.8 D ✓✓

1.1.9 A ✓✓

1.1.10 A ✓✓ (10x2) **(20)****1.2**

1.2.1 A only ✓✓

1.2.2 A only ✓✓

1.2.3 B only ✓✓

1.2.4 A only ✓✓

1.2.5 Both A and B ✓✓ (5x2) **(10)****1.3**

1.3.1 Roughage ✓✓

1.3.2 Thermometer ✓✓

1.3.3 Shed / Holding pen ✓✓

1.3.4 Cloning ✓✓

1.3.5 Punnet square ✓✓ (5x2) **(10)****1.4**

1.4.1 Omasum ✓

1.4.2 Nutritive ratio ✓

1.4.3 Dystocia ✓

1.4.4 Pulse rate ✓

1.4.5 Cryptochidism ✓ (5x1) **(5)****TOTAL FOR SECTION A: 45**

SECTION B**QUESTION 2: ANIMAL NUTRITION**

2.1.1

Stomach of a ruminant Figure 1	Stomach of a non-ruminant Figure 2
<ul style="list-style-type: none"> Has 4 parts rumen, reticulum, omasum and abomasums. The abomasums serves as the true stomach. ✓ 	<ul style="list-style-type: none"> Has a simple stomach or true stomach only. ✓
<ul style="list-style-type: none"> Digestion of cellulose takes place in the rumen and reticulum by microbes. ✓ 	<ul style="list-style-type: none"> No microbes and no digestion of cellulose. ✓

Any 2 (1 for ruminant and 1 for non-ruminant)

(2)

2.1.2.

- It produces bile. ✓
- Synthesize glucose
- Stores glycogen. ✓
- Stores the fat soluble vitamins A,D,E and K. ✓
- Secretes heparin which prevents blood clotting. ✓
- Temporary storage for excess nutrients. ✓
- Stores water and regulates the fluid balance.
- Produces red blood cells in embryo's ✓
- Destroys old blood cells in matured animals. ✓
- Converts ammonia into urea. ✓
- Helps in the excretion of waste products. ✓

Any 2

(2)

2.1.3.

- The small intestines are important because it is where the absorption of nutrients takes place. ✓
- The villi and the folds in the small intestines aid absorption. ✓
- Fluids such bile, pancreatic juice and succus entericus are secreted in the small intestines. ✓
- The peristaltic movement in the small intestines aids digestion and absorption. ✓

Any 3

(3)

2.2. A Selenium ✓

(1)

B

- Involved in the metabolism of propionic acid in the rumen of ruminants. ✓
- Helps in red cell formation and maturation. ✓
- Creates healthy nervous system. ✓
- Co-enzyme in bio-chemical reactions. ✓

Any one

(1)

C

- Wasting disease/staggers. ✓
- Anaemia. ✓
- Retarded growth. ✓
- Muscular weakness. ✓
- Poor hatching of eggs in chickens. ✓
- Unco-ordinated movement of hind legs in chickens. ✓

Any one

(1)

2.3.

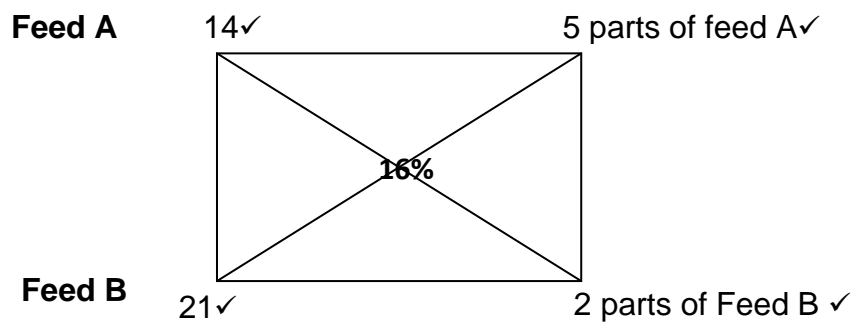
2.3.1 Digestibility co-efficient is the percentage ✓ at which the feed taken in by the farm animal is digested and utilized by the body of the farm animal. ✓ (2)

2.3.2

- The composition of the plant material. ✓
- Individuality of the animal. ✓
- Age of the plant. ✓
- Composition of the feed. ✓
- Composition of the ration. ✓
- Type of an animal/animal species. ✓
- Quantity of the feed taken. ✓
- Preparation of the feed ✓

Any 2 (2)

2.3.3



∴ 2 parts Feed B: 5 parts Feed A

(5)

2.3.4 Total digestible nutrients 75%
Digestible Proteins 20%

$$\text{Nutritive ratio} = 1: \frac{(\text{TDN}-\text{DP})}{\text{DP}} \checkmark$$

$$= 1: \frac{(75-20)}{20} \checkmark$$

$$= 1: 2.75 \text{ or } 1:3 \checkmark \text{ (narrow)}$$

(3)

2.3.5 The feed has a narrow ratio and therefore is good for production and growth (1)

2.4

2.4.1 Extensive farming. ✓ (1)

2.4.2 The Boer goats were kept in an open veld where they were exposed to cold and winter with no shelter ✓ (1)

2.4.3

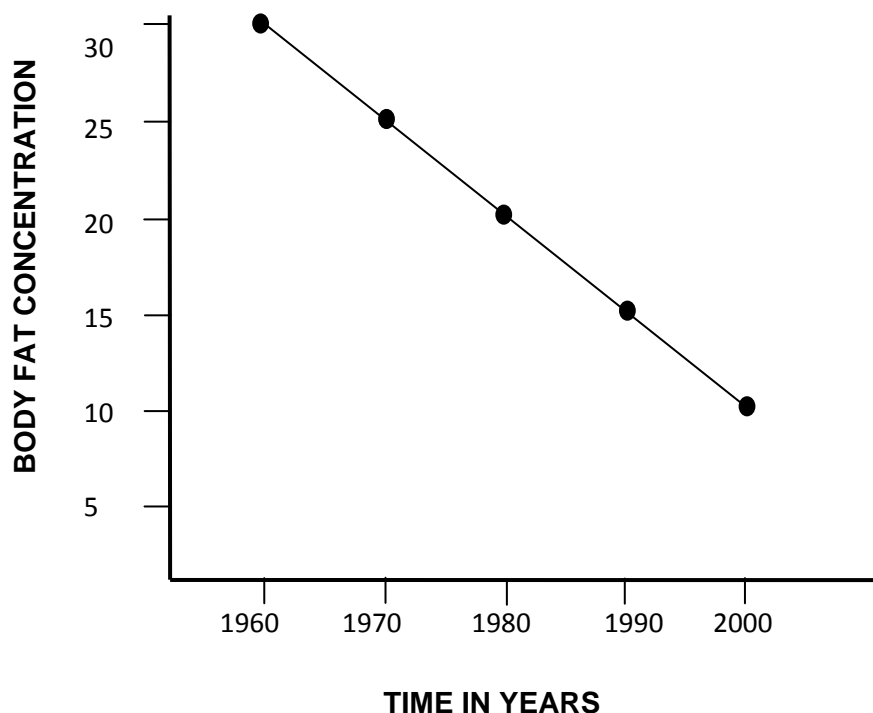
- To provide warmth for the goats/to protect goats from cold weather✓/to prevent the cold wind from getting into the shelter and affecting goats.✓ (2)

2.5

2.5.1 Position C (Flight zone) ✓ (1)

2.5.2 Position B. ✓

2.6.1 The body fat concentration of a mutton sheep breed from 1960 - 2000



Marking rubric

Criteria	Mark allocation
Line Graph	1
X axis correctly labelled	1
Y axis correctly labelled	1
Points correctly plotted	1
Correct heading	1
Units indicated on both axis	1

(6)
(35)

QUESTION 3: ANIMAL REPRODUCTION.**3.1**

- 3.1.1 (i) G ✓
 (ii) B ✓
 (iii) I ✓
 (iv) H ✓

(4)

3.2

- 3.2.1 A Mitosis ✓
 B First Meiotic division ✓
 C Spermatids ✓
 D Spermatozoa ✓

(4)

3.2.2. Diploid. ✓

(1)

3.3

- 3.3.1 E ✓
 3.3.2 F ✓
 3.3.3 D ✓
 3.3.4 C ✓
 3.3.5 A ✓
 3.3.6 B ✓

(6)

3.4

3.4.1 Oogenesis is the process where a mature ovum is formed from the primary oocyte ✓ in the ovary through meiosis ✓

(2)

3.4.2 Functions of hormones:

A Testosterone

- Development of secondary sexual characteristics ✓
- Functioning of male sexual accessory glands. ✓
- Production of spermatozoa. ✓
- Maintenance of the male reproductive system ✓
- Sexual desire ✓

any 1

(1)

B Relaxin

- Causes the relaxation of the muscles of the pelvic cavity to assist with the birth process. ✓

(1)

C Follicle stimulating hormone

- Stimulate the growth, development and the function of the Graffian Follicles. ✓
- Production of oestrogen in the Graffian follicle ✓ any 1 (1)

D Luteotropic hormone

- Induces the growth of mammary glands. ✓
- Initiates the secretion of milk after parturition. ✓
- Stimulates the udder to continue the secretion of milk. ✓
- Maintains the functioning of corpus luteum ✓
- Stimulates maternal behaviour. ✓
- Controls salt and water balance in the body. ✓
- Regulator of immune system. ✓
- Helps regulate the blood clotting. Any 1 (1)

3.5

3.5.1 Oestrus. (1)

3.5.2

- The vagina becomes swollen and secretes mucus ✓
- Scratches and mud appear on the rear end. ✓
- Cow becomes restless ✓
- Sudden decrease in milk production and feed intake. ✓ Any 3 (3)

3.6

3.6.1 Failure by the female animal to show signs of oestrus. ✓✓ (2)

3.6.2 Progesterone ✓ (1)

3.6.3

- Feed issues. ✓
- Contagious diseases. ✓
- Infection of the reproductive system. ✓ any 1 (1)

3.7

3.7.1 Collection of the semen. ✓ (1)

3.7.2 Artificial vagina ✓ (1)

3.7.3 Teaser cow / dummy cow ✓ (1)

3.7.4 12 hours after detecting oestrus ✓ (1)

3.7.5

- Large percentage of mobile and live spermatozoa ✓
- Low percentage of abnormalities ✓
- Thick whitish to yellowish ✓
- Volume of 4 to 8 ml ✓
- pH of 6,4 to 6,9 ✓ any 2 (2)

(35)

QUESTION 4**4.1**

- 4.1.1 A Tick ✓
D Fly ✓
F Mosquito ✓
G Flea ✓ (4)

4.1.2 External Parasites. ✓ (1)

4.1.3

- Redwater ✓
 - Heartwater ✓
 - Anaplasmosis ✓
- Any 1 (1)

4.2

4.2.1 Liver fluke ✓ (1)

4.2.2

- Tapeworm ✓
 - Roundworms ✓
- (2)

4.3

4.3.1 Immunisation programme ✓ (1)

4.3.2 Anthrax ✓ (1)

4.3.3 Bacterial diseases. ✓ (1)

4.3.4

- High fever. ✓
 - Swellings in the body. ✓
 - Blood stained faeces ✓
- any 1 (1)

4.3.5

- Clean and disinfect the stables, pens, milking parlours and all equipment ✓
 - Vaccinate animals. ✓
 - Treat animals with antibiotics. ✓
- Any 1 (1)

4.4.1

- (i) In breeding
 - (ii) Line breeding
 - (iii) upgrading
- (3)

4.4.2

- The herd becomes homozygotic ✓
 - The progeny remains closely related ✓
 - Desirable characteristics are kept in the herd over generations ✓
- Any 2 (2)

4.4.3

- Rapid results ✓
 - Increased genetic diversity ✓
 - Protects endangered species ✓
 - Improved yield. ✓
 - Improved tolerance and resistance to diseases and pests. ✓
 - Improved nutritional content. ✓
 - Improved growth ✓
- Any 2 (2)

4.4.4

- Gene gun ✓
 - Electroporation ✓
 - Micro-injection ✓
 - Agro-bacterium tumefaciens ✓
- Any 3 (3)

4.5

- 4.5.1 Bb
bb
- (2)

4.5.2

Parents	B✓	b✓
b	Bb✓	bb✓
b	Bb✓	bb✓

(6)

- 4.5.3. Complete dominance ✓
- (1)

4.6

Mutation	Variation
Sudden change in the genetic composition of an organism✓	The difference in the phenotype of organisms of the same species due to the influence of the genes and environment ✓
Mutation can cause variation✓	Variation cannot cause mutation. ✓

(35)