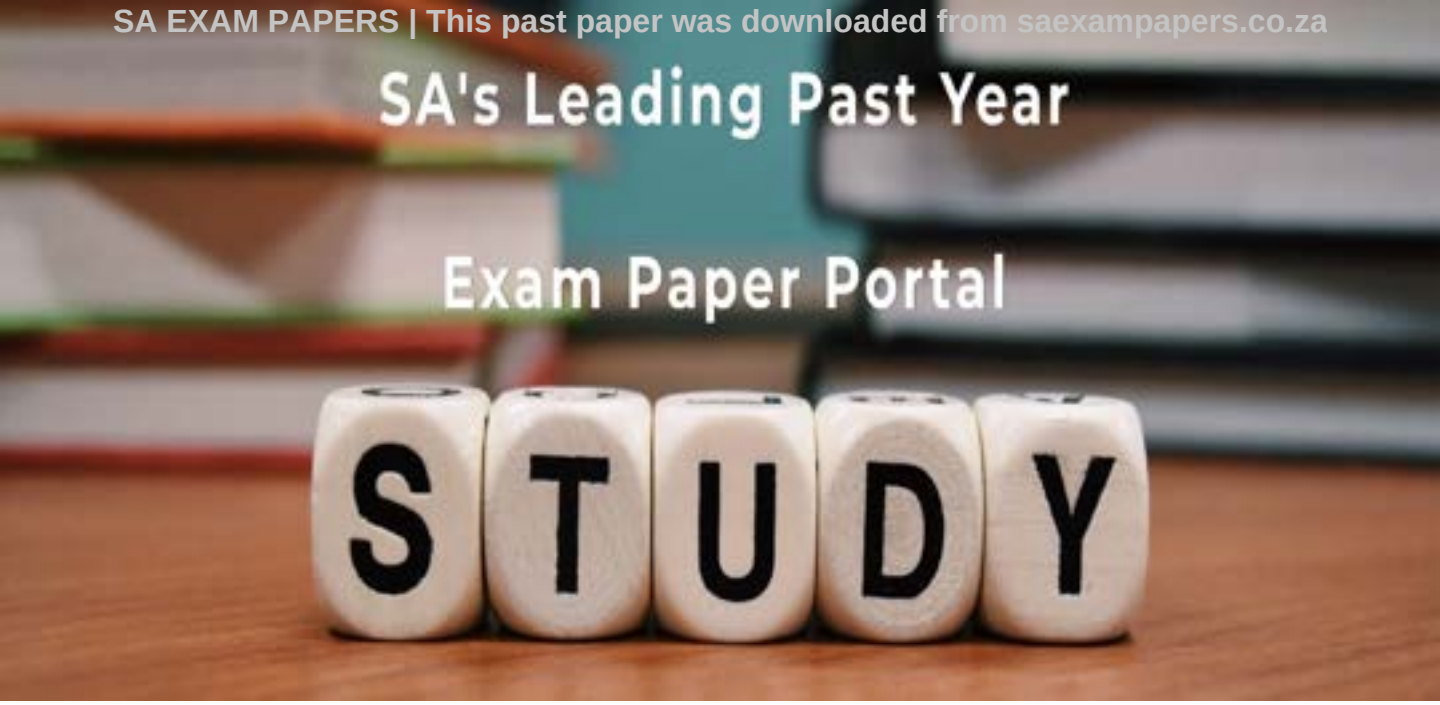


You have Downloaded, yet Another Great Resource to assist you with your Studies ☺

Thank You for Supporting SA Exam Papers

Your Leading Past Year Exam Paper Resource Portal

Visit us @ www.saexampapers.co.za

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2024

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 pages.

SECTION A

QUESTION 1

1.1

1.1.1	D ✓✓		
1.1.2	C ✓✓		
1.1.3	B ✓✓		
1.1.4	D ✓✓		
1.1.5	A ✓✓		
1.1.6	C ✓✓		
1.1.7	A ✓✓		
1.1.8	D ✓✓		
1.1.9	C ✓✓		
1.1.10	B ✓✓	(10 x 2)	(20)

1.2

1.2.1	B only ✓✓		
1.2.2	A only ✓✓		
1.2.3	None ✓✓		
1.2.4	Both A and B ✓✓		
1.2.5	None ✓✓	(5 x 2)	(10)

1.3

1.3.1	Papillae ✓✓		
1.3.2	Subsistence ✓✓		
1.3.3	Therapeutic ✓✓		
1.3.4	Morula ✓✓		
1.3.5	Vas deferens/sperm duct/ductus deferens ✓✓	(5 x 2)	(10)

1.4

1.4.1	Absorption ✓		
1.4.2	Bont ✓		
1.4.3	Placenta ✓		
1.4.4	Nuclear transfer/cloning ✓		
1.4.5	Corpus luteum ✓	(5 x 1)	(5)

TOTAL SECTION A: 45

SECTION B

QUESTION 2: ANIMAL NUTRITION

2.1 The alimentary canal of a farm animal

2.1.1 Identification of the structures

A - Liver ✓ (1)

B - Pancreas ✓ (1)

2.1.2 TWO functions of an alkaline substance secreted in the liver

- Activates the enzyme lipase to break down fats ✓
- Emulsifies fats ✓
- Improves absorption of fatty acids and glycerol ✓
- Helps with the absorption of fat-soluble vitamins A, D, K and E ✓
- Antiseptic and therefore counteracts putrefaction
- Neutralises the chyme from the stomach ✓ (Any 2) (2)

2.1.3 ONE intestinal gland located in small intestine

- Gland/crypts of Lieberkühn ✓
- Brunner's glands/duodenal glands ✓ (Any 1) (1)

2.2 Micro-organisms in ruminant farm animals

2.2.1 TWO requirements for the normal functioning of the micro-organisms

- Anaerobic conditions/oxygen free environment ✓
- Presence of carbon dioxide ✓
- pH of 5,5–6,5/slightly acidic ✓
- Temperature of 38–42ºC/warm environment ✓
- Regular intake of food ✓
- Removal of waste products ✓
- Osmotic conditions/presence of moisture ✓
- Presence of volatile fatty acids ✓
- Sufficient nutrients/minerals ✓
- Easy digestible carbohydrates ✓ (Any 2) (2)

2.2.2 ONE function of the micro-organisms in the rumen of cattle

- Digestion of cellulose/hemicellulose ✓
- Hydrolysis of proteins ✓
- Synthesis of vitamins ✓
- Synthesis of amino acids ✓ (Any 1) (1)

2.2.3 The micro-organism in the minority in the rumen of cattle

- Fungi ✓
- Viruses ✓
- Archaea ✓ (Any 1) (1)

2.3 **Food absorption into the bloodstream of farm animals**

2.3.1 **The process of food absorption in**
(a) Passive absorption/diffusion/osmosis ✓ (1)
(b) Active absorption ✓ (1)

2.3.2 **Identification of a diagram for absorption of glucose and amino acids -** Diagram B ✓ (1)

2.3.3 **Explanation of active absorption**
Absorption of nutrients from a low to a high concentration/against concentration gradient ✓ with the aid of ATP as a source of energy ✓ (2)

2.4 **Types of feeds**

2.4.1 **Classification of feeds**
(a) Roughages ✓ (1)
(b) Concentrates ✓ (1)

2.4.2 **Justification**
- It has a high protein content/16% ✓
- It has high Total Digestible Nutrients/TDN/82% ✓
- It has low crude fibre content/8% ✓ (Any 1) (1)

2.4.3 **Animal that cannot feed on FEED A**
Pig/fowl/poultry ✓ (1)

2.4.4 **Suitability of feed**
(a) **Improves the functioning of digestive system -** Feed A ✓ (1)
(b) **Stimulates butterfat production of milk -** Feed A ✓ (1)

2.5 **Components of feeds**

2.5.1 **Labelling C**
Organic component ✓ (1)

2.5.2 **The value of A**
5 kg ✓ (1)

2.5.3 **Calculation of the digestibility coefficient**
$$DC = \frac{\text{Dry material intake (kg)} - \text{Dry material excreted (kg)}}{\text{Dry material intake (kg)}} \times 100 \checkmark$$

$$= \frac{25\text{ kg} - 6\text{ kg}}{25\text{ kg}} \times 100 \checkmark$$

$$= 76 \checkmark \% \checkmark$$ (4)

2.6 **Energy flow**

2.6.1 **Definition of energy at A**
Digestible energy is the gross energy minus energy lost in faeces ✓✓ (2)

2.6.2 **Label for B**
Urine ✓ (1)

2.6.3 **ONE function of E**
For maintenance/production/reproduction/growth/work ✓ (1)

2.6.4 **Calculation of C**
Metabolic energy = 37,2 MJ – 9,8 MJ – 4 MJ ✓
= 23,4 MJ ✓ (2)

2.7 **Mixing of FEED A and B**
Calculation of the quantity of FEED B in a 750 kg ration
- 15 parts + 5 parts = 20 parts ✓
- **FEED B** (kg) = $\frac{5}{20}$ x 750 kg ✓
- = 187,5 kg ✓ (3)

[35]

QUESTION 3 : ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 **Intensive cattle production system**

3.1.1 **The production system**
Intensive productive system ✓ (1)

3.1.2 **TWO reasons**
- Large number of animals on a small area of land/high density ✓
- Presence of housing structures/facilities/silos ✓
- More capital invested ✓ (Any 2) (2)

3.2 **Shelters/housing facilities**

3.2.1 **Identification of the shelter/housing facility**
(a) Very cold windy conditions - PICTURE B ✓ (1)
(b) Hot summer conditions - PICTURE A ✓ (1)

3.2.2 **Term for the material covering the floor**
Bedding ✓ (1)

3.3 **Structures, apparatus and appliances used in the handling and management of farm animals**

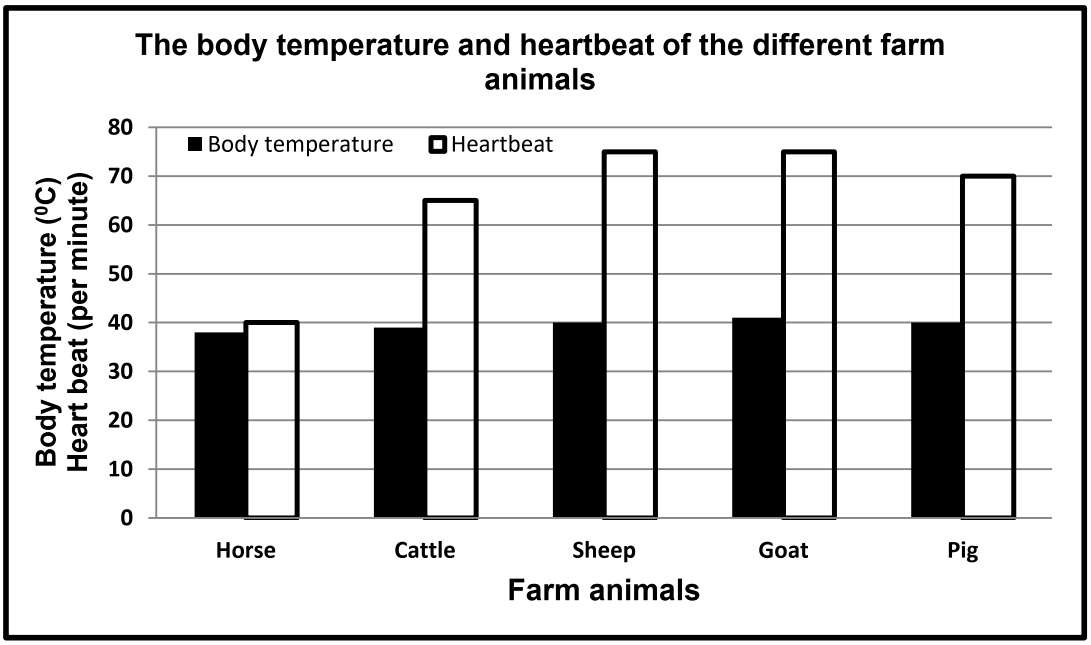
3.3.1 A ✓ (1)

3.3.2 D ✓ (1)

3.3.3 C ✓ (1)

3.4 **The body temperature, number of breaths and heartbeats per minute of different farm animals**

Combined bar graph



Criteria/rubric/marking guidelines

- Correct heading (with both variables) ✓
- X-axis: Correctly calibrated with label (Farm animals) ✓
- Y-axis: Correctly calibrated with label (Body temperature and heartbeat) ✓
- Correct units (º C and per minute) ✓
- Combined bar graph ✓
- Accuracy (80% + correctly plotted) ✓ (6)

3.5 **Methods to administer medication**

3.5.1 **Liquid medicine given to an farm animal orally**
Dosing/drenching ✓ (1)

3.5.2 **Applying medication into the muscle of farm animals**
Injecting ✓ (1)

3.6 **Animal diseases, pathogens and symptoms**

Identification of letters

A Fungus ✓ (1)
B African Swine Fever/swine flu ✓ (1)
C Inflammation of the udder/milk is thick/watery and flaky/ drop in milk production/reduced mobility due to limping ✓ (1)
D Protozoa ✓ (1)
E Anthrax ✓ (1)

3.7 **Life cycle of parasites**

3.7.1 **Classification of the parasites**
Internal parasites/endoparasites ✓ (1)

3.7.2 **Name of the parasite**
Tapeworm ✓ (1)

3.7.3 **Classification of parasite B according to the number of hosts**
Two host parasite ✓ (1)

3.7.4 **TWO costs aligned with the control of parasites**
- Treatment costs/cost of anthelmintics ✓
- Labour costs at the time of treatment ✓ (2)

3.8 **External parasites**

3.8.1 **Identification of the letter**
(a) Parasite B ✓ (1)
(b) Parasite A ✓ (1)

3.8.2 **TWO symptoms of PARASITE B/mites infestation**
- Skin irritation ✓
- Dermatitis/inflammation of the skin ✓
- Hair loss ✓
- Restlessness ✓
- Biting/rubbing/kicking/wagging of tails to relieve discomfort ✓
- Skin breaks ✓ (Any 2) (2)

3.8.3 **TWO precautionary measure to prevent blowfly infestation**
- Correct timing of shearing and crutching ✓
- Lambing time should be after shearing ✓
- Clipping and cleaning of coat ✓
- Breeding resistant animals ✓
- Tail docking ✓
- Sanitation/hygienic practises ✓
- Proper treatment of wounds ✓ (Any 2) (2)

3.9 **Type of a parasite**

3.9.1 Internal parasite/endoparasites ✓ (1)

3.9.2 External parasite/ectoparasite ✓ (1)
[35]

QUESTION 4: ANIMAL REPRODUCTION

4.1 Reproductive process in farm animals

4.1.1 **Labelling for**
A Egg cell/ovum/female gamete ✓ (1)
B Sperm cell/male gamete/spermatozoon ✓ (1)

4.1.2 **Name of the process**
Spermatogenesis ✓ (1)

4.1.3 **ONE example of a secondary female reproductive organ visible**
- Uterus ✓
- Fallopian tube/oviduct ✓
- Infundibulum ✓ (Any 1) (1)

4.1.4 **Identification of the processes**
1 Ovulation ✓ (1)
2 Fertilisation ✓ (1)

4.1.5 **ONE function for each of the organs**
(a) Fallopian tube
- Site for fertilisation ✓
- Transportation of sperm cells and egg cells to opposite directions ✓
- Transportation of the zygote to the uterine body ✓ (Any 1) (1)

(b) Uterus
- For implantation of the developing embryo ✓
- Protects and nourishes the embryo ✓
- Contraction of the uterine walls to facilitate fertilization and expulsion of the foetus ✓
- Housing the embryo ✓ (Any 1) (1)

4.2 The procedure of manipulating the female farm animal

4.2.1 **Term for the procedure**
Oestrus synchronisation ✓ (1)

4.2.2 **ONE method to synchronise oestrus**
- Injecting prostaglandin/administering of FSH/LH ✓
- Implants containing progesterone ✓
- Injecting stilboestrol/oestrogen ✓
- Mixing MGA/PG in feed ✓
- Inserting controlled internal drug release (CIDR) into the vagina ✓
- Administering of gonadotropin-releasing hormone/GnR ✓(Any 1) (1)

4.2.3 **Factor causing sterility and infertility in bulls associated with**
(a) Bull has an unbalanced ration - Malnutrition ✓ (1)
(b) Young bull is raised in isolation - Inexperience/ immaturity ✓ (1)

4.3 **Oestrus cycle**

4.3.1 **Identification of the process**
Oestrus cycle ✓ (1)

4.3.2 **Stages of oestrus**
C Pro-oestrus ✓ (1)
D Oestrus ✓ (1)

4.3.3 **ONE practical method to identify cows on heat**
- Use of pedometer ✓
- Use of tail chalking ✓
- Use of chin-ball markers ✓
- Use of heat mount detectors/kamar heat detectors ✓
- Use of teaser animals ✓
- Regular observation/close monitoring of heat behaviour ✓(Any 1) (1)

4.4 **Reproductive technique to increase animal production**

4.4.1 **Identification of the reproductive technique**
Artificial Insemination/AI ✓ (1)

4.4.2 **Name of the method to collect semen**
Use of an artificial vagina ✓ (1)

4.4.3 **The role of the substance in a dilutant**
(a) **Antibiotics -** Prevent bacterial growth/infections ✓ (1)
(b) **Buffers -** Protection against changes in pH ✓ (1)
(c) **Egg yolk -** Provides nutrients for the sperm cell/ prevents cold shock ✓ (1)

4.5 **Embryo transfer/transplant**

4.5.1 **Definition of the embryo transfer**
A technique where the embryos are harvested from the donor cow ✓ and transferred to the recipient cows ✓ (2)

4.5.2 **Term for**
(a) **Female 1 -** Donor/superior cow ✓ (1)
(b) **Female 2, 3 and 4 -** Recipient/inferior/surrogate cows ✓ (1)

4.5.3 **Importance of female 1/donor**
It provides genetically superior characteristics/embryos ✓ (1)

4.5.4 **ONE disadvantage of embryo transfer/transplant**

- It is expensive ✓
- Requires skills and experience ✓
- Synchronisation of the recipient and donor is difficult ✓
- Donor cow may not become pregnant after being artificially inseminated ✓
- Time consuming and labour intensive ✓
- Recipient cows may not become pregnant/abortion may occur ✓
- Embryo from the superior cow does not necessarily guarantee a superior calf ✓ (Any 1) (1)

4.6 **Parturition**

Letters of the steps when the cow is giving birth

D ✓ (1)
B ✓ (1)
C ✓ (1)
A ✓ (1)

4.7 **Milk synthesis and ejection**

4.7.1 **ONE method the milker can stimulate the milk let down process**

- Washing of the udder with warm water ✓
- Massaging the udder ✓
- Bringing the calf closer to the cow ✓
- Making sounds (whistling) ✓ (Any 1) (1)

4.7.2 **Indication of how oxytocin stimulate milk let down process**

Causes contractions of the myoepithelial cells surrounding alveolus ✓ (1)

4.7.3 **Importance of a dry period**

To give time for the glandular tissues of the udder to recover ✓ (1)

4.7.4 **Substance in the colostrum giving calf immunity**

Antibodies/immunoglobulins ✓ (1)

[35]

TOTAL SECTION B: 105
GRAND TOTAL: 150