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# **basic education**

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

**AGRICULTURAL SCIENCES P1**

**2019**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 10 pages.**

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

1.1	1.1.1	C ✓✓	(10 x 2)	(20)
	1.1.2	B ✓✓		
	1.1.3	B ✓✓		
	1.1.4	D ✓✓		
	1.1.5	A ✓✓		
	1.1.6	D ✓✓		
	1.1.7	B ✓✓		
	1.1.8	C ✓✓		
	1.1.9	A ✓✓		
	1.1.10	D ✓✓		
1.2	1.2.1	B only ✓✓	(5 x 2)	(10)
	1.2.2	None ✓✓		
	1.2.3	Both A and B ✓✓		
	1.2.4	A only ✓✓		
	1.2.5	B only ✓✓		
1.3	1.3.1	Peristalsis ✓✓	(5 x 2)	(10)
	1.3.2	Shed/feed shed/silo/barn ✓✓		
	1.3.3	Cloning/nuclear transfer ✓✓		
	1.3.4	Synchronisation of oestrus ✓✓		
	1.3.5	Freemartin ✓✓		
1.4	1.4.1	Biological value/BV ✓	(5 x 1)	(5)
	1.4.2	Chronic ✓		
	1.4.3	Hypoplasia ✓		
	1.4.4	Mummification ✓		
	1.4.5	Implantation ✓		

**TOTAL SECTION A: 45**

**SECTION B****QUESTION 2: ANIMAL NUTRITION****2.1 Alimentary canal of a farm animal**

- 2.1.1 **Name of the animal**  
Poultry/fowl/chicken ✓ (1)
- 2.1.2 **Identification of the letter**  
(a) C ✓ (1)  
(b) E ✓ (1)  
(c) A ✓ (1)
- 2.1.3 **The role of part B in digestion**  
It moistens ✓ and softens/soaking food ✓ (2)
- 2.1.4 **Identification of the letter corresponding to a pig stomach**  
A ✓ (1)

**2.2 Digestion in the stomach and small intestines**

- 2.2.1 **Name of the enzymes**  
A Rennin ✓ (1)  
E Lipase ✓ (1)
- 2.2.2 **Identification of the labels**  
B Peptides/polypeptides/peptones/proteoses ✓ (1)  
C Starch ✓ (1)  
F Amino acids ✓ (1)
- 2.2.3 **Part of the small intestines where digestion occurs**  
Duodenum ✓ (1)
- 2.2.4 **Explanation of the importance of fat emulsification**  
It increases the surface area ✓ for easier digestion ✓ (2)

**2.3 Minerals and vitamins**

- 2.3.1 Zinc ✓ (1)
- 2.3.2 Vitamin A ✓ (1)
- 2.3.3 Phosphorus ✓ (1)
- 2.3.4 Vitamin K ✓ (1)

**2.4 Nutritive ratio**

- 2.4.1 **Recommendation of the feed**  
(a) Feed B ✓ (1)  
(b) Feed A ✓ (1)  
(c) Feed C ✓ (1)

2.4.2 **Indication of the part representing digestible non-nitrogen**  
8 ✓ (1)

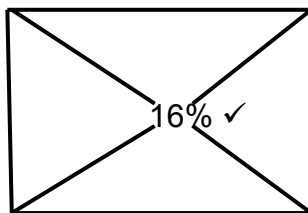
2.4.3 **Justification for recommending feed A for a calf**  
It is rich in protein/narrow nutritive ratio ✓ needed for growth ✓ (2)

2.5 **Pearson square**

2.5.1 **The method used to prepare a ration**  
Pearson square method ✓ (1)

2.5.2 **Calculation of the ratio of maize : sunflower oilcake meal**

Maize 14% 29 parts ✓



Sunflower 45 % 2 parts ✓

Ratio of maize to sunflower oilcake meal is 29:2 ✓ (4)

2.5.3 **Calculation of percentage of sunflower oilcake meal**

$$29 + 2 = 31 \checkmark$$

$$\frac{2}{31} \times 100 \checkmark$$

$$= 6,45/6,5\% \checkmark$$

**OR**

$$\frac{2}{31} \checkmark \times 100 \checkmark$$

$$= 6,45/6,5\% \checkmark \quad (3)$$

2.6 **TWO roles of a good fodder flow programme**

- To ensure safe use of the resources ✓
  - To meet animal feed requirements ✓
  - Margin over feed costs ✓
  - Manageability ✓
  - Focus on weekly/monthly/annual production and consumption ✓
  - Ensure the continual supply of fodder to animals ✓
- (Any 2) (2)
- [35]**

**QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL****3.1 Farming systems****3.1.1 Identification of farming systems****A** Subsistence ✓

(1)

**B** Commercial ✓

(1)

**3.1.2 Comparing subsistence and commercial farming systems****(a) Purpose of the output****Subsistence** - Output is mainly for feeding the family/not for profit ✓

(1)

**Commercial** - Output is mainly for selling/profit ✓

(1)

**(b) Impact on environment****Subsistence** - No/little impact as there is no pollution ✓

(1)

**Commercial** - Huge impact because of high production of manure/higher rate of pollution ✓

(1)

**3.1.3 Disadvantage of farming system B**

Large scale spread of diseases/loss of production ✓

(1)

**3.1.4 Economic benefit of farming system B over A**

High production/income/profit for the farmer ✓

(1)

**3.2 Facilities used in an animal production enterprise****3.2.1 Identification of the facilities****A** Water trough ✓

(1)

**B** Feed trough ✓

(1)

**3.2.2 Indication of the purpose for facility C**

To restrain farm animals ✓

(1)

**3.3 Life cycle of a parasite****3.3.1 Classification of parasite**

Internal/endoparasite ✓

(1)

**3.3.2 Reason**

It lives in the body of the host ✓

(1)

**3.3.3 Identification of intermediate host**

Snail/slug ✓

(1)

**3.3.4 Environmental condition for survival of an intermediate host**

Wet/moist condition ✓

(1)

**3.3.5 TWO precautionary measures to prevent parasite infestation**

- Avoid/fence off wet areas during grazing ✓
- Rotational grazing/resting veld ✓
- Zero grazing ✓
- Veld burning ✓
- Breed animals resistant to parasite infestation ✓
- Clean drinking water ✓
- Provision of good nutrition ✓

(Any 2) (2)

**3.4 Animal handling****3.4.1 TWO reasons for handling farm animals**

- Normal management programmes of animals/dehorning/marking/castration/docking ✓
- Prevention/treatment of parasites/dosing/vaccination ✓
- Determination of the animal's age ✓
- Determination of pregnancy ✓
- Generation of data such as growth rate, mass and market readiness ✓
- Transportation of animals ✓

(Any 2) (2)

**3.4.2 Effect of incorrect handling practice**

- (a) Animals will flee/lash out/injures the handler/get startled ✓ (1)
- (b) Sheep will be injured/damage the skin ✓ (1)
- (c) There will be fighting/aggression ✓ (1)

**3.5 TWO basic housing requirements**

- Protection from extreme climatic conditions/direct solar radiation/rain/wind ✓
- Sufficient/adequate lighting ✓
- Provision of cooling/heating systems ✓
- Provision of bedding ✓
- Food and clean water should be easily accessible ✓
- Easy movement of workers should be ensured ✓
- Housing construction must be cost-effective ✓
- Appropriate size to minimize over-crowding ✓

(Any 2) (2)

**3.6 Diseases caused by micro-organisms in farm animals****3.6.1 Identification of the letters**

- (a) Mastitis ✓ (1)
- (b) Virus ✓ (1)
- (c) Dark/red urine ✓ (1)
- (d) Wool sheep/Merino sheep ✓ (1)
- (e) Protozoa ✓ (1)

**3.6.2 TWO roles of the state in the control of farm animal diseases**

- Public awareness/notify public ✓
- Conduct research ✓
- Import/export bans ✓
- Supplying veterinary services ✓
- Generate and implement legislation ✓
- Control movement of animals/movement permits ✓
- Setting of quarantine zones ✓

(Any 2) (2)

**3.7 Salt poisoning in livestock****3.7.1 TWO symptoms of salt poisoning**

- Increased thirst ✓
- Dry/red mucous membranes of the mouth ✓
- Hypersensitivity ✓
- Irritability ✓
- Excessive salivation ✓
- Increased urination/defecations ✓
- Constipation ✓
- Vomiting and regurgitation ✓
- Inflammation of the stomach ✓
- Abdominal pain and diarrhoea ✓
- Wobbling/staggering/circling/blindness/seizures/paralysis ✓
- Dragging the hind legs/knuckling of the fetlock ✓
- Aggressiveness ✓

(Any 2) (2)

**3.7.2 TWO ways of treating animals with salt poisoning**

- Immediate removal of the source ✓
- Treatment with hypertonic dextrose/isotonic saline solution ✓
- Provision of fresh/clean water ✓

(Any 2) (2)  
**[35]****QUESTION 4: ANIMAL REPRODUCTION****4.1 Diagram of a sperm cell****4.1.1 Identification of Part A**

Nucleus ✓

(1)

**4.1.2 Letter of the part representing the acrosome**

B ✓

(1)

**4.1.3 Function of the Parts**

- (a) **Part D** Provides energy to the sperm cell for movement ✓ (1)
- (b) **Part E** Facilitates/propel movement of the sperm cell ✓ (1)



**4.2 Male reproductive organs**

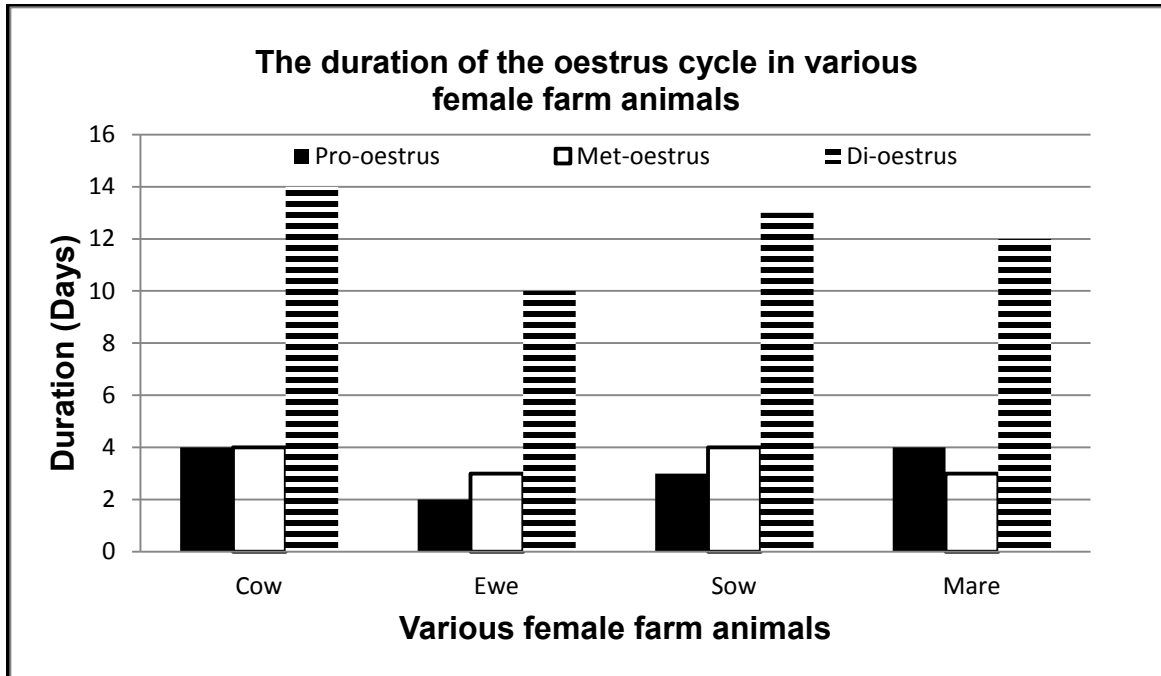
- 4.2.1 Vas/ductus deferens/seminal tube ✓ (1)
- 4.2.2 Prostate gland ✓ (1)
- 4.2.3 Epididymis/vesicular gland/seminal vesicle ✓ (1)

**4.3 Hormonal control during the oestrus cycle**

- 4.3.1 **Definition of oestrus cycle**  
Recurring periods of oestrus ✓ alternating with sexual rest ✓ (2)
- 4.3.2 **Process at B**  
Ovulation ✓ (1)
- 4.3.3 **Function of luteinising hormone**
- Stimulates the rupturing of the Graafian follicles/causes ovulation ✓
  - For maturation of oocytes ✓
  - For the formation of corpus luteum ✓
  - Facilitates the capturing of the ova/tightening the infundibulum ✓
- (Any 1) (1)
- 4.3.4 **THREE signs of oestrus in cows**
- Mounts other cows ✓
  - Restlessness ✓
  - Swelling of the vulva ✓
  - Excessive mucus secretion from the vulva ✓
  - Mucus membranes of the vagina appears red and moist ✓
  - Scratches, manure and mud on the rear end ✓
  - Cows sniffs/licks the genitalia of other cows ✓
  - Tail/head/rump hair is fluffed up ✓
  - Raised tail ✓
  - Loss of appetite ✓
  - Decrease in milk production ✓
  - Allows Mating ✓
- (Any 3) (3)

#### 4.4 Stages of the oestrus cycle

A bar graph on the duration (in days) of the different stages in the oestrus cycle in various female farm animals



##### Criteria/rubric/marketing guidelines

- Correct heading ✓
- X-axis: Correct calibrations and labelled (Various female farm animals) ✓
- Y-axis: Correct calibrations and labelled (Duration) ✓
- Correct unit (Days) ✓
- Bar graph ✓
- Accuracy ✓

(6)

#### 4.5 Technique used by farmers

##### 4.5.1 Identification of the technique

Artificial Insemination/AI ✓

(1)

##### 4.5.2 TWO characteristics of good, quality semen

- Colour - whitish to yellowish/milky/opaque ✓
- Sticky ✓
- Less than 15 % dead sperm cells/less mortality rate ✓
- 80% of sperm cells showing forward movement/mobility/motility/viability ✓
- Less than 20 % deformation/normal morphology ✓
- Characteristic odour ✓
- Healthy/disease free semen ✓
- pH - 6,4 to 6,9/slightly acidic ✓
- Concentration - 1,1 to 4,5 billion sperm cells per ml ✓
- Volume - 4 to 8ml ✓

(Any 2) (2)

- 4.5.3 **Apparatus held by the hand A**  
Pistolette/insemination gun ✓ (1)
- 4.5.4 **Best time for inseminating a cow**  
The next morning ✓ (1)
- 4.5.5 **ONE negative effect of technique by inexperienced person**  
  - Injury of the reproductive tract of the cow ✓
  - Unexpected low pregnancy result ✓ (Any 1) (1)
- 4.6 **Reproductive technique conducted in cows**
- 4.6.1 **Reproductive technique**  
Embryo transplant/ET ✓ (1)
- 4.6.2 **Letters representing the FIRST TWO stages in sequence**  
 E ✓  
 C ✓ (2)
- 4.6.3 **TWO benefits of the technique to farmers**  
  - More progeny produced from best cows ✓
  - More profit ✓
  - Fast genetic improvement of the herd ✓
  - Productive life of older cows is extended ✓
  - Breeding animals with improved efficiency of production ✓
  - Genes in a herd are conserved/prevent extinction of valuable animals ✓ (Any 2) (2)
- 4.7 **Stage of pregnancy**
- 4.7.1 **Term for a fertilised diploid cell**  
Zygote ✓ (1)
- 4.7.2 **Cell containing 16 cells of the stage**  
Morula ✓ (1)
- 4.7.3 **TWO non-infectious causes of termination of pregnancy**  
  - Injuries ✓
  - Malnutrition/incorrect feeding ✓
  - High dosage of drugs and hormones ✓
  - Chemical poisoning/strong laxative/toxic feeds ✓
  - Maltreatment/stress/trauma ✓
  - Transportation ✓
  - Vaccination ✓
  - Embryo abnormalities/ovum/sperm defects ✓
  - Genetic defects ✓
  - Multiple foetus pregnancies ✓ (Any 2) (2)
- [35]**

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